

# **Final Report on Environment and Social Management Framework (ESMF)**

State of Maharashtra Agri-Business and Rural  
Transformation (SMART) Project

27 September 2019



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# Issue and Revision Record

| Revision | Date | Originator | Checker | Approver | Description |
|----------|------|------------|---------|----------|-------------|
|          |      |            |         |          |             |
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**Document reference:** 408004AA01 | 00 | 02

**Information class:** Standard

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## List of Abbreviations

|                 |                                                                       |
|-----------------|-----------------------------------------------------------------------|
| ATMA            | Agricultural Technology Management Agency                             |
| AP              | Affected People                                                       |
| APEDA           | Agricultural and Processed Food Products Export Development Authority |
| APMC            | Agricultural Produce Marketing Committee                              |
| ARAP            | Abbreviated Resettlement Action Plan                                  |
| BDS             | Business Development Services                                         |
| BEE             | Bureau of Energy Efficiency                                           |
| BIS             | Bureau of Indian Standards                                            |
| BPL             | Below Poverty Line                                                    |
| Ca              | Calcium                                                               |
| CBO             | Community Based Organization                                          |
| CEO             | Chief Executive Officer                                               |
| CFC             | Chloro-Fluoro Carbon                                                  |
| CH <sub>4</sub> | Methane                                                               |
| CIB & RC        | Central Insecticides Board and Registration Committee                 |
| Cl              | Chlorine                                                              |
| CLF             | Cluster Level Federations                                             |
| CMRC            | Community-Managed Resource Centres                                    |
| CO              | Carbon Monoxide                                                       |
| CO <sub>2</sub> | Carbon Dioxide                                                        |
| CPCB            | Central Pollution Control Board                                       |

|           |                                              |
|-----------|----------------------------------------------|
| CRPP      | Climate Resilient Perspective Plan           |
| CRZ       | Costal Regulation Zone                       |
| DoA       | Department of Agriculture                    |
| DAP       | Diammonium Phosphate                         |
| DDT       | Dichloro Diphenyl Trichloroethane            |
| D.G       | Diesel Generator                             |
| DIU       | District Implementation Unit                 |
| DPR       | Detailed Project Report                      |
| EC        | Electrical Conductivity                      |
| EIA       | Environmental Impact Assessment              |
| EHS       | Environment, Health and Safety               |
| EMP       | Environment Management Plan                  |
| E&S       | Environment and Social                       |
| ESA       | Environment and Social Assessment            |
| ESDD      | Environmental and Social due diligence       |
| ESMF      | Environment and Social Management Framework  |
| ETL       | Economic Threshold Level                     |
| ETP       | Effluent Treatment Plant                     |
| EX-ACT VC | Ex Ante Carbon Balance Tool for Value Chain  |
| Fe        | Iron                                         |
| FAO       | Food and Agriculture Organization            |
| FGD       | Focus Group Discussion                       |
| FPC       | Farmer Producer Company                      |
| FPIC      | Free and Prior Informed Consent              |
| FPO       | Farm Producer Organisation                   |
| FSSAI     | Food Safety and Standards Authority of India |
| FYM       | Farm Yard Manure                             |
| GAP       | Good Agricultural Practices                  |
| GCA       | Gross Cropped Area                           |
| GHG       | Green House Gases                            |
| Gol       | Government of India                          |
| GoM       | Government of Maharashtra                    |
| GM        | Genetically Modified                         |
| GIM       | Green India Mission                          |
| GIS       | Geographical Information System              |
| GRC       | Goat Rearing Cooperatives                    |
| GRM       | Grievance Redress Mechanism                  |

|            |                                                                     |
|------------|---------------------------------------------------------------------|
| Ha         | Hectare                                                             |
| HACCP      | Hazard Analysis and Critical Control Points                         |
| HCFC       | Hydro Chloro Fluoro Carbon                                          |
| HFC        | Hydro Fluoro Carbon                                                 |
| HIV / AIDS | Human Immuno-Deficiency Virus / Acquired Immune Deficiency Syndrome |
| HVA        | Higher Valuechain Activity                                          |
| HVAC       | Heating Ventilation and Air Conditioning                            |
| IDM        | Integrated Disease Management                                       |
| IEC        | Information, Education and Communication                            |
| IFC        | International Finance Corporation                                   |
| IMD        | Indian Meteorological Department                                    |
| INM        | Integrated Nutrient Management                                      |
| INR        | Indian Rupee                                                        |
| INPM       | Integrated Nutrient and Pest Management                             |
| IP         | Indigenous People                                                   |
| IPDP       | Indigenous People Development Plan                                  |
| IPF        | Indigenous People Framework                                         |
| IPP        | Indigenous People Plan                                              |
| IPM        | Integrated Pest Management                                          |
| IWMP       | Integrated Watershed Management Program                             |
| JNNSM      | Jawaharlal Nehru National Solar Mission                             |
| JSA        | Jalayukt Shivar Abhiyan                                             |
| K          | Potassium                                                           |
| KCC        | Kisan Credit Card                                                   |
| KG         | Kilogram                                                            |
| LED        | Light Emitting Diode                                                |
| LMC        | Land Management Committee                                           |
| LPG        | Liquefied Petroleum Gas                                             |
| LULC       | Land use and Land Cover Change                                      |
| MACP       | Maharashtra Agriculture Competitiveness Project                     |
| MAP        | Market Access Plans                                                 |
| M&E        | Monitoring and Evaluation                                           |
| MAVIM      | Mahila Arthik Vikas Mahamandal                                      |
| MCIC       | Maharashtra Climate Innovation Centre                               |
| Mg         | Magnesium                                                           |
| Mg / L     | Milligram per Litre                                                 |
| MGNREGA    | Mahatma Gandhi National Rural Employment Guarantee Act              |

|                  |                                                      |
|------------------|------------------------------------------------------|
| MIS              | Management Information System                        |
| Mm               | Millimetres                                          |
| MM               | Mott MacDonald                                       |
| MoU              | Memorandum of Understanding                          |
| MPCB             | Maharashtra State Pollution Control Board            |
| MRL              | Maximum Residue Level                                |
| MSAMB            | Maharashtra State Agricultural Marketing Board       |
| MSAPCC           | Maharashtra State Action Plan on Climate Change      |
| MSME             | Ministry of Micro, Small and Medium Enterprises      |
| MSRLM            | Maharashtra State Rural Livelihood Mission           |
| MT               | Metric Tonnes                                        |
| MTR              | Mid-Term Review                                      |
| MVSTF            | Maharashtra Village Social Transformation Foundation |
| MW               | Mega Watts                                           |
| NABARD           | National Bank for Agriculture and Rural Development  |
| NAPCC            | National Action Plan on Climate Change               |
| NICRA            | National Initiative on Climate Resilient Agriculture |
| N <sub>2</sub> O | Nitrogen Dioxide                                     |
| NO <sub>x</sub>  | Nitrous Oxide                                        |
| NOC              | No Objection Certificate                             |
| NMEEE            | National Mission for Enhanced Energy Efficiency      |
| NMSA             | National Mission for Sustainable Agriculture         |
| NPK              | Nitrogen, Phosphorous and Potassium                  |
| NPOP             | National Programme for Organic Production            |
| NSSO             | National Sample Survey Organization                  |
| NTFP             | Non-timber Forest Product                            |
| NWM              | National Water Mission                               |
| OC               | Organic Carbon                                       |
| OP               | Operational Policies of the World Bank               |
| PAF              | Project Affected Families                            |
| PAP              | Project Affected Persons                             |
| PACS             | Primary Agriculture Cooperative Society              |
| PCMU             | Project Coordination and Management Unit             |
| PCN              | Project Concept Note                                 |
| PDO              | Project Development Objective                        |
| PESO             | Petroleum and Explosives Safety Organization         |
| PIU              | Project Implementation Unit                          |

|                     |                                                                                                  |
|---------------------|--------------------------------------------------------------------------------------------------|
| PoCRA               | Project on Climate Resilient Agriculture                                                         |
| PPP                 | Private Partnership Plans                                                                        |
| PRI                 | Panchayati Raj Institution                                                                       |
| PTG                 | Primitive Tribal Groups                                                                          |
| PUC                 | Pollution Under Control                                                                          |
| PVTG                | Particularly Vulnerable Tribal Groups                                                            |
| QCI                 | Quality Council of India                                                                         |
| RAP                 | Resettlement Action Plan                                                                         |
| RF                  | Resettlement Framework                                                                           |
| R&R                 | Resettlement and Rehabilitation                                                                  |
| RPF                 | Resettlement Policy Framework                                                                    |
| RSC                 | Residual Sodium Carbonate                                                                        |
| RTFCTLARR           | Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement |
| SAR                 | Sodium Adsorption Ratio                                                                          |
| SC                  | Scheduled Caste                                                                                  |
| SEP                 | Stakeholder Engagement Plan                                                                      |
| SIA                 | Social Impact Assessment                                                                         |
| SDP                 | State Domestic Product                                                                           |
| SO <sub>2</sub>     | Sulphur Dioxide                                                                                  |
| SOC                 | Soil Organic Carbon                                                                              |
| SOM                 | Soil Organic Matter                                                                              |
| SHG                 | Self Help Group                                                                                  |
| SMART               | State of Maharashtra Agribusiness and Rural Transformation                                       |
| SMF                 | Social Management Framework                                                                      |
| Sq. m.              | Square metre                                                                                     |
| ST                  | Scheduled Tribe                                                                                  |
| S-W                 | South-West                                                                                       |
| tCO <sub>2</sub> Eq | MT of Carbon di-oxide equivalent                                                                 |
| ULB                 | Urban Local Bodies                                                                               |
| UNDP                | United Nations Development Program                                                               |
| US\$                | United States Dollar                                                                             |
| UT                  | Union Territory                                                                                  |
| WB                  | World Bank                                                                                       |
| WHH                 | Women Headed Households                                                                          |
| WHO                 | World Health Organization                                                                        |
| WHS                 | Water Harvesting Structure                                                                       |

|      |                              |
|------|------------------------------|
| WPR  | Workforce Participation Rate |
| WUA  | Water User Association       |
| WUE  | Water use Efficiency         |
| ZBNF | Zero Budget Natural Farming  |



## Executive summary

The State of Maharashtra's Agribusiness and Rural Transformation (SMART) Project is proposed for funding by The World Bank (WB). It is aimed at extending support for the development of inclusive and competitive value chains focusing on small and marginal farmers and Agri-entrepreneurs. The project backed with technical inputs will also seek to increase access of farmers to new and organized markets and improve women's transition to higher valuechain activities (HVA).

The various activities proposed in the components/ sub components of the SMART are expected to result in social and environmental impacts. To understand these impacts (positive and negative) and to suggest enhancement / mitigation strategy, as part of preparation of SMART, an Environment and Social Management Framework (ESMF), was commissioned by Department of Agriculture, Government of Maharashtra, through M/S Mott MacDonald (MM).

ESMF was based on intensive discussions with the project proponents, review of associated policies and regulations, baseline study and stakeholder consultations to understand the social and environment issues in the context of the proposed activities under SMART. The ESMF assessed the impacts, both positive and negative, that the project interventions will have on the various stakeholders and social and environmental issues, directly or indirectly.

Random sampling was followed for the baseline survey to ensure that social and environmental issues applicable to the project are adequately captured. The survey covered stakeholders in the value-chain, mainly producers, in different parts of the project area; 4800 households (HHs) covering 20 community-based organizations (CBOs) in nine agro-climatic zones covering eight Agri-commodities.

The stakeholders were either involved through survey, individual interviews, or through Focussed Group Discussions (FGDs) and village level meetings, including women, Scheduled Castes (SC), Scheduled Tribes (ST) and Women-Headed Households (WHH).

The food safety standards were assessed through consultation with agribusiness stakeholders and line departments. A review of reports of MRL testing was also carried out in the study. An assessment of use of chemical and bio-pesticides, bio-fertilizer and chemical fertiliser, areas under Good Agricultural Practice (GAP), implementation of Integrated Nutrient Management (INM) and Integrated Pest Management (IPM) was carried out.

Based on the above assessment, required strategies, framework, guidelines and targets were developed. This included environmental management framework for GAP certification strategy, social management framework, indigenous people framework, citizen engagement plan, labour management framework, grievance redress mechanism, food safety strategy, monitoring plan, guideline on clearance procedures for food and agriproducts import into India and Pest Management Plan.

### Review of Central and State Rules, Regulations, Policy and Schemes

A review of national and state level policies and regulations applicable for project implementation as it related to environmental and social aspects and the World Bank Safeguards and Operational Policies (OPs) was carried out. This review helped in assessing adequacy of the existing policies and regulations and identifying gaps, for which additional measures have been included in the

Environmental and Social Management Framework (ESMF). The applicable operational policies are:

- OP 4.01 Environmental Assessment
- OP 4.09 Pest Management
- OP 4.10 Indigenous People Development Plan
- OP 4.12 Involuntary Resettlement.

### Environmental Baseline

- Maharashtra is in the North Centre of Peninsular India between 15° 45' N to 22° 06' N latitude and 72° 36' E to 80° 54' E longitude and covers a geographic area of 3,07,713 sq.km.
- Topography of the State comprises of the Western Ghats along western border and the Deccan Plateau.
- Maharashtra's geology comprises of the deccan trap (82 percent) with remaining area under alluvial deposit, Proterozoic rock, Gondwana system and Lameta and Bagh Beds.
- The soil types in Maharashtra are light black soil, medium black soil, deep black soil, reddish brown soil, alluvial soil, yellowish brown soil, laterite soil and coastal saline soil. However, black soil covers the maximum area (27 %) in Maharashtra except for Ratnagiri and parts of Chandrapur district.
- Based on rainfall, soil type and vegetation, Maharashtra is divided into nine Agro-climatic zones. North Konkan zone (3,000 mm/year), South Konkan zone (3,000 mm/year) and the Western Ghats zone (4000 mm per year) receive very heavy rainfall, whereas sub mountain zone (700 - 2500 mm/year), Western Maharashtra plain zone (700 - 1200 mm/year) and Eastern Vidarbha zone (1300 to 1800 mm/year) receive moderate rainfall, and scarcity zone or Central Maharashtra plateau zone (700 - 900 mm/year) and Central Vidarbha Zone (1200 mm/year) receive comparatively less rainfall.
- Temperature in Maharashtra varies as per climatic zones: North Konkan zone (22-33 degree Celsius), South Konkan zone (20-30 degree Celsius), Western Ghats zone (30-40 degree Celsius), Sub mountain zone (28-35 degree Celsius), Western Maharashtra Plain zone (up to 40 degree Celsius), Eastern Vidarbha zone (up to 37 degree Celsius), Central Maharashtra plateau zone (up to 40 degree Celsius) and Central Vidarbha Zone ( 35-40 degree Celsius).
- Maharashtra has a total geographical area of 307.71 lakh Ha out of which the net cropped area is 169.10 lakh Ha and gross cropped area is 232.24 lakh Ha The average cropping intensity in Maharashtra is 137.3 percent.
- As per Economic Survey of Maharashtra 2018-19, the total area under irrigation in the State is 39.50 lakh Ha which is about 17.8 percent of the total gross area under cultivation.
- The proposed Project intervention excludes area under forest in Maharashtra which is 61.36 lakh Ha, i.e. 19.94 percent of the total area. District-wise forest distribution statistics indicate that Latur has the least area under forest cover and Gadchiroli has the largest forest cover. The total forest cover for India is 21.54 percent of the total area of the country as per India State of Forest Report, 2017.
- The proposed Project also excludes any intervention in any of 6 National Parks and 35 Wildlife Sanctuaries covering an area of 15,526 sq. km (15.53 lakh Ha) which constitute 5.04 percent of the State's geographic area. Wetland area in Maharashtra is also excluded which is estimated to be 10.15 lakh Ha that accounts to 3.30 percent of the total geographical area of the State.
- As per Agricultural and Processed Food Products Export Development Authority (APEDA), Ministry of Commerce and Industries, Government of India, consolidated organic agricultural

statistics for the year 2017-18 under National Programme for Organic Production (NPOP), 1.08 lakh Ha of land area is certified as organic and additional 1.27 lakh Ha of land area is under process of conversion into organic farming.

- 82 percent of agricultural area in Maharashtra is rainfed. So, this makes agriculture vulnerable to the impacts of climate change due to its high dependence on rain fed agriculture. As per climate and agriculture report of Department of Agricultural Meteorology, Mahatma Phule Krushi Vidyapeeth, Pune the worst affected districts in Maharashtra are Solapur, Osmanabad, Nanded, Aurangabad, Ahmednagar, Sangli, Satara, Beed, Nashik, Buldhana, Latur, Jalna, Jalgaon and Dhule.
- As per the Economic survey of Maharashtra 2018-19, consumption of chemical pesticide in Maharashtra varied from 13,496 MT to 15,705 MT, between 2016 to 2019. The bio-pesticides consumption varied from 1,454 MT to 2,252 MT in the same duration. In the same period, the chemical fertilizer consumption at 62.10 lakh MT indicates consumption of chemical fertilizer as 124.8 kg/per Ha As per Economic Survey of Maharashtra 2017-18, the region wise consumption pattern indicates that fertilizer consumption is maximum in Aurangabad region followed by Pune and Nashik regions.

### Social baseline

Some of the key social baseline observations are as under:

1. Due to random sampling and nature of the activities, the survey found that, nearly 33 percent of the surveyed HHs belonged to backward communities (SC, ST, Nomadic Tribes);
2. The major economic activities pursued by the surveyed HHs was agriculture based i.e., agriculture, livestock and farm wage earning;
3. The survey that covered all categories of agriculture farmers, suggests that nearly all the HHs reported 30-50 percent of HH income from agriculture;
4. About 50 percent of the surveyed HHs were marginal (with up to 1 Ha landholding) and small (up to 2 Ha landholding) farmers;
5. Involvement of women in agriculture HVA was very poor despite significant numbers at the production levels;
6. Lack of market access, exploitation by middleperson, shortage of working capital, lack of market intelligence services, distance from market, Lack of infrastructure/storage facility, mismatch between labour demand and supply (labour shortage during harvesting and other activities), lower profitability - higher production cost, were common issues;
7. Women - CBOs i.e. CLFs and CMRCs, have limited exposure and experience in the post-harvest management and marketing areas;
8. In the surveyed CBOs (not including Women - CBOs), the 21 percent of member were women and 20 percent of women were Board of Directors. The percent of Women Signatory/ies in the Board of Directors was negligible at 1 percent;
9. Little or no collateral for availing credit also restricted women's participation in post-harvest valuechains; and
10. Lack of land ownership rights restricted women's opportunities to participate in extension trainings, access to finance and infrastructure support.

### Environmental Impacts

Screening of impacts attributed to agricultural and allied activities resulted in identifying of the following major environmental observations and impacts:

- 55-60 percent farmers did not have soil health card, raising the chances of improper use of fertiliser;
- The agri-commodity wise MRL values in mg/kg of the samples tested by DoA, GoM (2016-17 to 2018-19) were compared against standards set by FSSAI Regulation, 2011. It showed excessive MRL values in 16 agri-commodities.
- Health, safety and hygiene related impacts and contamination of soil due to improper disposal of used and empty pesticide and agro-chemical containers;
- Noticeable impacts were attributed to unscientific disposal of solid waste generated from Food Processing Industry, Wholesale Markets, Retail shops and Traders;
- Ground water and surface water quality was impacted due to incorrect usage of pesticides and chemical fertilizers;
- Impact on forest land noticed due to grazing of goat and sheep in the forest area;
- Impact on farmer's health and safety is noticed due to improper handling of pesticides and other harmful agro-chemicals; and
- Impact on agriculture due to climate change or unsupportive environment result in loss of yield and post-harvest losses.

### Green House Gas Emission

- Greenhouse Gas Emission estimation of value chain has been conducted for six commodities namely cotton, turmeric, soybean, okra, banana and goat using FAO's Ex-Act value chain tool. The calculation is based on the current and upgraded scenario wherein it has been envisioned to achieve 10 percent efficiency in energy consumption, use of chemical fertiliser and other resource utilisation in the upgraded scenario. The area of sowing in most of the sub-project plans remains the same as SMART does not have direct influence at the production level.

The results of analysis of GHG emission estimation of upgraded scenario is summarised below.

- Out of the above six commodities, turmeric has highest saving of GHG emission, Cotton, Soybean, and Banana have moderate savings and Okra has insignificant savings.
- GHG emission from goat rearing increases due to increase of number of goats from 3640 in current scenario to 8176 in the project scenario due to GHG emission related to fodder practices and enteric fermentation.
- GHG emission from Okra increases mainly because organic manures are increased by 10 percent and chemical manure is reduced by 10 percent. It is evident that nitrogenous chemical manure like urea is a sink for CO<sub>2</sub> while there is a positive emission due to increase of organic manure.

### Construction Management

All the construction work needs to be complied with environmental and social management framework in addition to national and local regulatory and statutory requirements. A separate indicative guideline has been prepared as part of this report for compliance to the ESMF.

### Good Industrial Practices – Slaughter House

New and existing slaughter houses to be supported by SMART shall comply with Good Industrial Practices for Slaughterhouse included in this ESMF report the guideline includes goat rearing, transportation requirement for animals, slaughter house layout, waste management practices and Central Pollution Control Board (CPCB) standards.

## Guidelines on Food and Agri Imports

Food and Agri imports to India are regulated by Food Safety and Standard (Import) Regulation 2017 and Plant Quarantine (Regulation of Import to India) Order 2003 with requirements of certification process to be complied by the importers. Chapter 12 includes guideline on food and Agri-products import to India.

## Pest Management Plan

The recent data of economic survey 2018-19 of Maharashtra shows 15,705 MT of chemical fertilisers and 2,252 MT of biopesticides are used in Maharashtra. The commodity wise share of pesticides used in Maharashtra is 30 percent in cotton, 20 percent in vegetable, 20 percent in oil seeds and 10 percent each in fruits, cereals and pulses. This calls for implementation and enhancement of coverage of integrated pest management and integrated nutrient management. The SMART will contribute in enhancement of area under INM and IPM practices in State by providing for training and capacity building to CBOs.

## Air Pollution in Agri-Value Chain

In the absence of knowledge on soil quality, farmers are using excessive nitrogenous fertilisers which results in emission of oxides of nitrogen. The other sources of air pollution are burning of crops residue and emission from processing of Agri-produce and food processing industry. This shall be mitigated by providing training and awareness programs on technology and management measures prepared in environmental management framework of this study.

## Health and Safety

It was found during the survey that farmers were not using proper safety gears which resulted in accidents involving farm equipment, machineries and vehicles. The other health and safety risks related to snake and animal bites which were occurring frequently with farmers.

The health impacts associated with improper usage of chemical and pesticides without using proper safety gears impacts health and safety of the workers. These impacts will also be mitigated by providing awareness training and monitoring system prepared in the environmental and social management framework report.

## Environmental and Social Management Framework

Based on the outcome of survey, an appropriate Environmental and Social Management Framework (ESMF) has been formulated that will be implemented as part of SMART. It includes identification of the Environmental and Social (E&S) impacts resulting from the proposed project interventions, detailing of the mitigation measures, and impact monitoring indicators (process and outcome indicators). The ESMF describes the implementation schedule in accordance with the project cycle. The institutional framework for E&S management has been aligned with the proposed SMART project management structure.

Identification of impacts has been done based on the selected criteria namely context, duration, and time. For positive impacts, enhancement measures have been suggested and for negative impacts mitigation measures are included under ESMF.

Some of the positive impacts include opportunities for increased income for producers, employment opportunities in rural areas through Productive Partnership (PP) proposals and Market Access Plans (MAP). By improving market linkages of farmer producers, including for

women and marginal farmers, demand and subsequent production is expected to increase leading to increased income for producers.

The ESMF process includes screening process to ensure that project under various sub components does not involve any land acquisition/ appropriation and physical displacement of the people. If any new land is required, direct purchase method will be adopted. Project will ensure that any public land allotted for any of the project activities will be encumbrance free. However, the Bank Policy on Involuntary Resettlement (OP 4.12) may be applicable to this project, owing to small and large (in cases of slaughter houses) civil works. In the latter case, an 'Entitlement Matrix' has been proposed. For civil work, the labour management framework has been proposed.

The process flow for ESMF clearly spells out the strategy to be followed for all the proposed SMART investments:

- Proposals with insignificant impacts will require no further action and will be cleared.
- Proposals with minor impacts will be cleared with suggestions for good practices and applicable mitigation measures.
- Proposals with moderate impact will be cleared after suitable mitigation measures are incorporated with compliance monitoring.
- Proposals expected to have major impacts, standalone environmental and social impact assessment will be suggested, and the final clearance will have conditionality of following an environmental and social management plan (ESMP).

The project does not create any barrier for participation and engagement of women, SC/ST and other vulnerable sections or groups. However, to enhance their participation, the ESMF incorporates measures including Information, Education and Communication (IEC) and, training and capacity building. Culturally appropriate training modules will be developed to help these vulnerable groups to access project benefits at par with others. ESMF also includes measures like helping these vulnerable groups to avail extension services etc. The project will develop a database on membership and representation of women, SC/ST and other vulnerable groups in village level institutions.

At the state level, the Implementing Agency (IA), i.e. Department of Agriculture (DoA) has established a Project Coordination and Management Unit (PCMU). An Environmental and Social Management (ESM) cell, is also proposed under the PCMU, which will be responsible for addressing the E&S related issues of the project. The requisite information to ESM cell will be made available through appropriate support from the Technical teams in the Project Implementing Units (PIUs) to make informed decisions regarding E&S issues. The project includes training and capacity building of the officers of PIU and EIA (Environmental Impact Assessment) on E&S management issues under the project.

### Environmental and Social Budget

The environmental and social management budget for the project is estimated to be **INR 48,29,20,000/-** (Rupees Forty Eight Crores Twenty Nine Lakhs and Twenty Thousand Only) including training capacity building of CBOs, development of IEC material, environmental and social monitoring, technical services for agencies and third-party audit.

# 1 Introduction

Mott MacDonald has been commissioned by the Project Coordination and Management Unit (PCMU) to undertake an Environment and Social Management Framework (ESMF) of the SMART to be implemented across Maharashtra.

## 1.1 Project Background

Agriculture is the mainstay of the State of Maharashtra with 55 percent of its total population directly or indirectly dependent on agriculture (Source: Task force on Agriculture development, Niti Aayog, 2015). The State accounts for 11.81 percent of India's Gross Cropped Area (GCA), and, agriculture and allied activities contributes 11 percent to the State's income. Principal crops of the State include rice, jowar, bajra, wheat, pulses, cotton, sugarcane and several oil seeds including groundnut, sunflower and soybean. The state has numerous areas, under fruit cultivation with mango, banana, grapes, pomegranate orange etc., and cashew nuts being the main horticultural crops. Major vegetables cultivated in Maharashtra are onion, chilli, tomato, potato and flower crops like gerbera, carnations, roses, especially under protected cultivation.

According to 2010-11 State Agriculture Census, the total farmers in the state stands at nearly 13.6 million, of which 48.9 percent and 29.5 percent are marginal and small farmers, respectively. In other words, an overwhelming majority (78.4 percent of the total) are small and marginal farmers. The total operational land holding of small and marginal farmer (up to 2.0 Ha /farmer) was 8.925 million Ha or 45.2 percent of the total land holding.

### 1.1.1 Key challenges in Agriculture and Allied Activities in the State

Maharashtra is one of the richest states in terms of per capita income, but its agricultural productivity is low. This sector is plagued by lack of aggregation among farmers resulting in low economies of scale which increase production and marketing costs, combined with involvement of many intermediaries along the supply chain. The key challenges faced by the State are:

- Declining Gross State Value Added: The share of agriculture and allied activities sector in the total GSVA is on the decline over the years (about 12.2 percent during 2016-17 as against 15.3 percent during 2001-02), whereas still majority of the State's population is dependent on agriculture and allied sector for their livelihood.
- Shrinking average agricultural holdings: The average size of agricultural holdings has been on the decline (from 4.28 Ha to 1.44 Ha), whereas, increase in the number of marginal and small farmers, and their dependency on monsoon and weather are resulting in low profitability.
- Irrigation potential utilized is 26.54 lakh Ha (about 40 percent of irrigation potential created).
- Infrastructure gaps in processing, storage, transport, marketing and R&D.
- Low representation of women in higher levels of value chains such as management, marketing and decision-making and having higher financial returns.

*[Source: Project Implementation Plan]*

Hence, the Government of Maharashtra conceptualized the implementation of the State of Maharashtra's Agribusiness and Rural Transformation (SMART) Project to:

- facilitate aggregation of farm produce through the development of community-based organizations (CBOs)

- provide market linkage through end-to-end solutions in Public-Private Partnership (PPP) mode.

## 1.2 Project Background

The project intends to collaboratively formulate and implement SMART project with the assistance of the World Bank aiming at transforming rural Maharashtra through interventions in Agriculture and Livelihood sectors. The Government of Maharashtra intends to implement the SMART Project through revamp of agricultural value chains, with special focus on small and marginal farmers across the State, in alignment with Government of India's efforts towards doubling of farmers' income by 2022.

### 1.2.1 Project Development Objective (PDO)

The PDO thus includes support for the development of inclusive and competitive agriculture value chains, focusing on small landholding farmers and Agri- entrepreneurs. The PDO would be achieved by expanding access to new and organized markets for producers and enterprises with complementary investments in technical services and risk management capabilities. It would support following interventions

- Enhancing Institutional Capacity for Agribusiness Reforms
- Support Enterprise Growth and Expand Market Access
- Building Risk Mitigation Mechanism.

### 1.2.2 Project Components

The project has five major components. The detailed components and sub-components are provided in the following table:

Table 1: Project Components and Sub-components

| <b>Component A:<br/>Enhancing Institutional<br/>Capacity to Support<br/>Agricultural<br/>Transformation</b> | <b>Component B:<br/>Expanding Market<br/>Access and<br/>Supporting Enterprise<br/>Growth</b>                                                                                                      | <b>Component C:<br/>Building Risk<br/>Mitigation<br/>Mechanisms</b>                        | <b>Component D:<br/>Project<br/>Management,<br/>Monitoring and<br/>Learning</b>                                          |
|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| A1: Enhancing Institutional Capacity of Department of Agriculture                                           | B1: Market Access Support. (PP, MAP and Innovations)<br><br>Priority Sector Investments in Infrastructure- SMART Cotton, Exports Facility and Livestock Services<br><br>Capacity Building Support | C1: Enhanced market information and intelligence services                                  | D1: Project Co-ordination & Implementation Framework<br><br>D2: Inclusion & Gender Strategy<br><br>D3: MIS and M & E     |
| A2: Enhancing Institutional Capacity of Department of Marketing                                             | B2: Enterprise Development Support<br><br>B3: Pilot Programme on Urban Food Systems<br><br>B4: Access to Finance                                                                                  | C2: Strengthening the warehouse receipts systems<br><br>C3: Price Risks Management Support | D4: Fiduciary Arrangement<br><br>D5: Safeguards- Environment & Social<br><br>D6: Project Governance & Citizen Engagement |

**Component A:  
Enhancing Institutional  
Capacity to Support  
Agricultural  
Transformation**

**Component B:  
Expanding Market  
Access and  
Supporting Enterprise  
Growth**

**Component C:  
Building Risk  
Mitigation  
Mechanisms**

**Component D:  
Project  
Management,  
Monitoring and  
Learning**

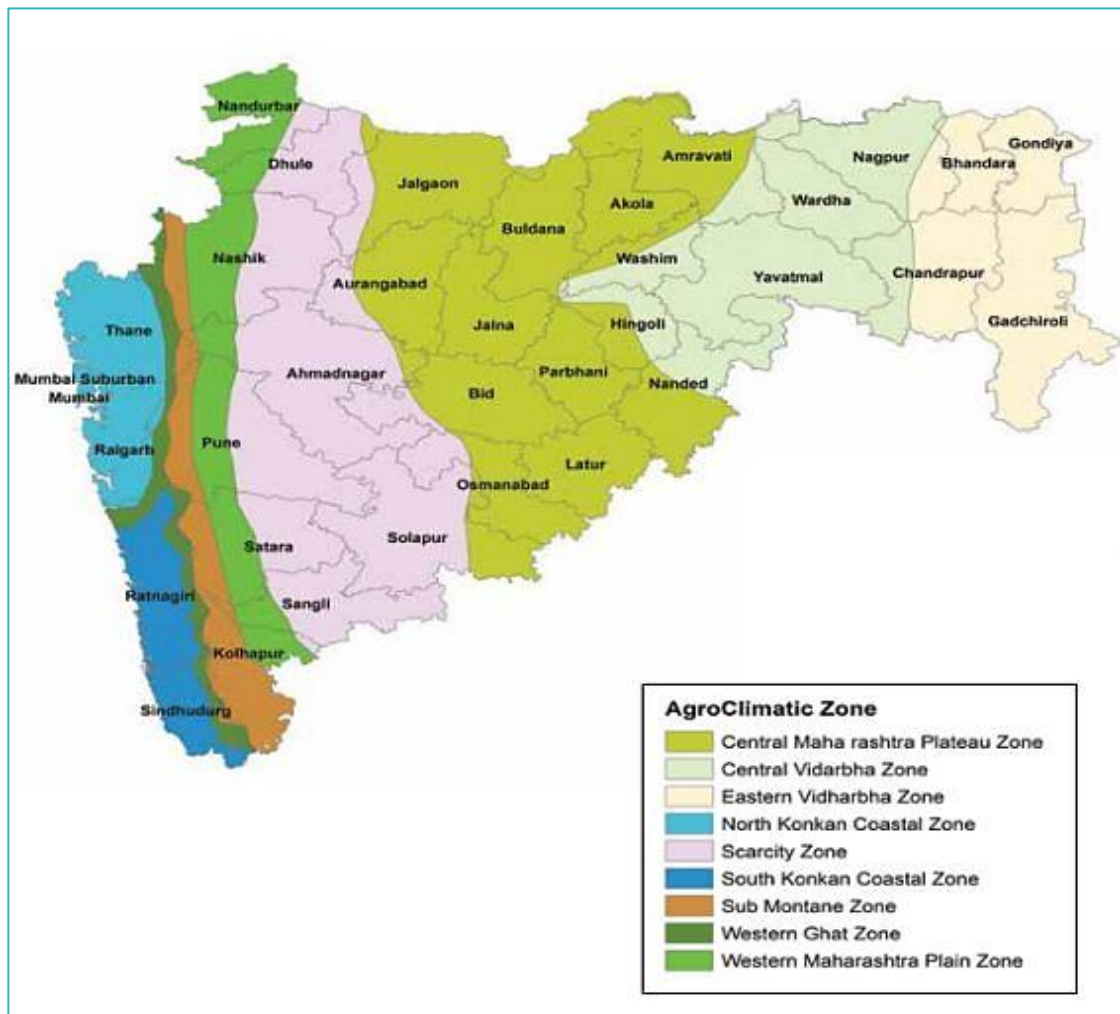
A3: Strengthening capacity for  
Reform Measures and Joint  
actions

### 1.2.3 Project Beneficiaries

The primary project beneficiaries are CBOs such as the Self-Help Groups (SHG), Community managed Resource Centres (CMRC), Cluster Level Federations (CLF), Farm Producer Companies (FPC) and Primary Agriculture Cooperative Society (PACS). The project is expected to benefit approximately 1000 CBOs of the State through the development of Productive Partnerships (PPs), Market Access Plans (MAPs) and Collateral Management Plans (CMPs) among private entities, MSMEs, start-ups, etc.

### 1.2.4 Project Coverage

The SMART Project will be implemented in the entire State of Maharashtra. The nine Agri-climatic zones of the State are shown in the following map:

**Figure 1: Project Coverage Areas**

Source: Department of Agriculture, Government of Maharashtra

### 1.2.5 Project Implementation Structure

The project will be implemented through Project Co-ordination and Management Unit (PCMU) and 11 Project Implementing Units (PIUs) including

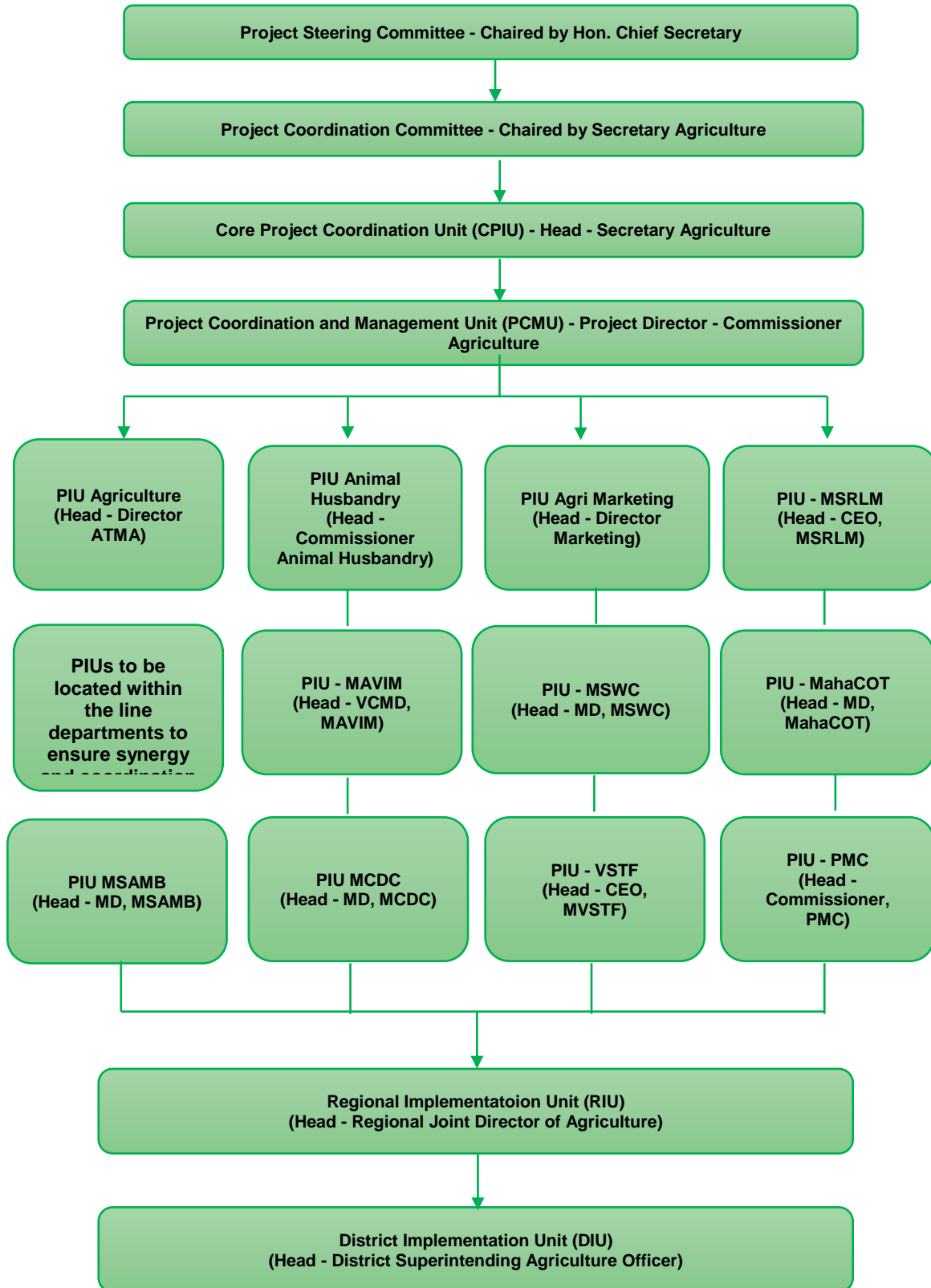
- Department of Agriculture
- Department of Animal Husbandry
- Department of Cooperation and Agriculture Marketing
- Maharashtra State Agriculture Marketing Board (MSAMB)
- Maharashtra State Warehousing Corporation (MSWC)
- Maharashtra Co-operative Development Corporation (MCDC)
- Maharashtra State Cotton Growers Marketing Federation (MahaCOT)
- Maharashtra State Rural Livelihood Mission (MSRLM)
- Mahila Arthik Vikas Mahamandal (MAVIM)
- Village Social Transformation Foundation (VSTF)
- Pune Municipal Corporation (PMC)

The project will capitalize on community-based organizations and institutions formed under the following interventions:

- Maharashtra Agriculture Competitiveness Project (MACP) – The project objective was to increase productivity, profitability and market access. Under the project, 412 Farmer Producer Companies (FPC) were established
- Mahila Arthik Vikas Mahamandal (MAVIM) – over a decade of efforts has been made by MAVIM to initiate, expand and establish the SHG movement in Maharashtra. MAVIM is working in all districts of Maharashtra covering 11,326 villages and formed 97,301 SHGs.
- Maharashtra State Rural Livelihood Mission (MSRLM) – The project objective is to alleviate poverty through livelihood interventions. Under the project, 3.8 lakh SHGs, 12,610 Village Organizations, 479 Cluster Level Federations (CLFs) and 7000 Micro enterprises have been formed. The project is implemented in 34 districts, 351 blocks, 28,091 Gram-Panchayats and 42,642 villages.
- Maharashtra Village Social Transformation Foundation (VSTF) – The project mission is to transform 1000 villages in Maharashtra by enhancing development indicators of villages. It serves as a platform to garner support of corporate sector for rural development

The SMART project implementation structure is presented in the Figure below:

**Figure 2: Project Implementation Structure**



Source: Project Implementation Plan

### 1.3 Proposed Environmental and Social Management Team

The project coordination and management unit (PCMU) will have one environmental and one social and gender officer on full time basis. There are eight regional Joint Director of Agriculture (JDA) Offices in the Project area and each Regional JDA office will have one Social and Environment expert. MSRLM and MAVIM will have social experts on deputation.

Role and responsibility of Environment and Social Officers are as follows:

- Assess and confirm requirement of EIA/ SIA (Social Impact Assessment) and EMP (Environment Impact Plan) or resettlement plan as per the ESMF.
- Provide oversight on environmental management aspects of projects;
- Ensure EMP or construction management plan forms part of the Bid document
- Establish a system to monitor environmental safeguards of the project including monitoring the indicators set out in the monitoring plan;
- Facilitate and confirm overall compliance with all Government rules and regulations regarding site and environmental clearances as well as any other environmental requirements (e.g., Location Clearance Certificates, Consent to Establish, Consent to Operate etc.), as relevant;
- Supervise and provide guidance to the site staffs to properly carry out the environmental monitoring and assessments as per the ESMF;
- Review, monitor and evaluate the effectiveness with which the Plans are implemented, and recommend necessary corrective actions to be taken as required;
- Consolidate monthly/ quarterly environmental monitoring reports;
- Address any grievances brought about through the Grievance Redress Mechanism (GRM) in a timely manner.
- As Pune Municipal Corporation (PMC) and Maharashtra State Agriculture Marketing Board (MSAMB) will have major civil works, a social cum resettlement specialist will be sourced from the market at the time of DPR preparation. These experts will be responsible for managing the adverse impacts and risks, ensure compliance with the SMF (Social Management Framework) /Resettlement Framework Provisions and monitor and report on the effectiveness of the various mitigation measures.

#### 1.3.1 Selection of Crops for intervention under the SMART Project

Since specific value chains will be targeted under the Project, critical exercises were undertaken to select the crops. The initial shortened list included 35 crops which were further scrutinized before preparing the final list of crops. Presently, 26 crops have been selected for the project intervention and more crops are being evaluated for further inclusion. The criteria for selection of crops was developed through extensive discussions and inputs from stakeholders and knowledgeable informants. These criteria are as below:

- Perceived economic value of the crop to the State
- Requirement of water for cultivation of the crop
- Proportion of small and marginal farmers cultivating the crop
- Participation of women in cultivation, harvesting and post-harvest operations of the crop
- Potential of value addition in post-harvest operations (marketing, transport, processing, storage)
- Export potential of the crop or its products and by-products
- Wide-spread cultivation of the crop in the State

- Listing of crops on futures exchanges (as on March 2019)
- Inclusion of crop in the list of commodities for which Minimum Support Price (MSP) is declared by the State or the Centre
- The level of volatility in prices of the crop (during the last six years, 2012-2018)
- Rise in demand in relation to supply (during the last six years, 2012 – 2018)

In this context, Mott MacDonald (MM) has been contracted as Consultant to carry out an Environment and Social Assessment (ESA) to identify key environmental and social issues and challenges and risk associated with SMART project. The detailed approach and methodology for the assignment is presented in the next chapter.

## 2 Approach and Methodology

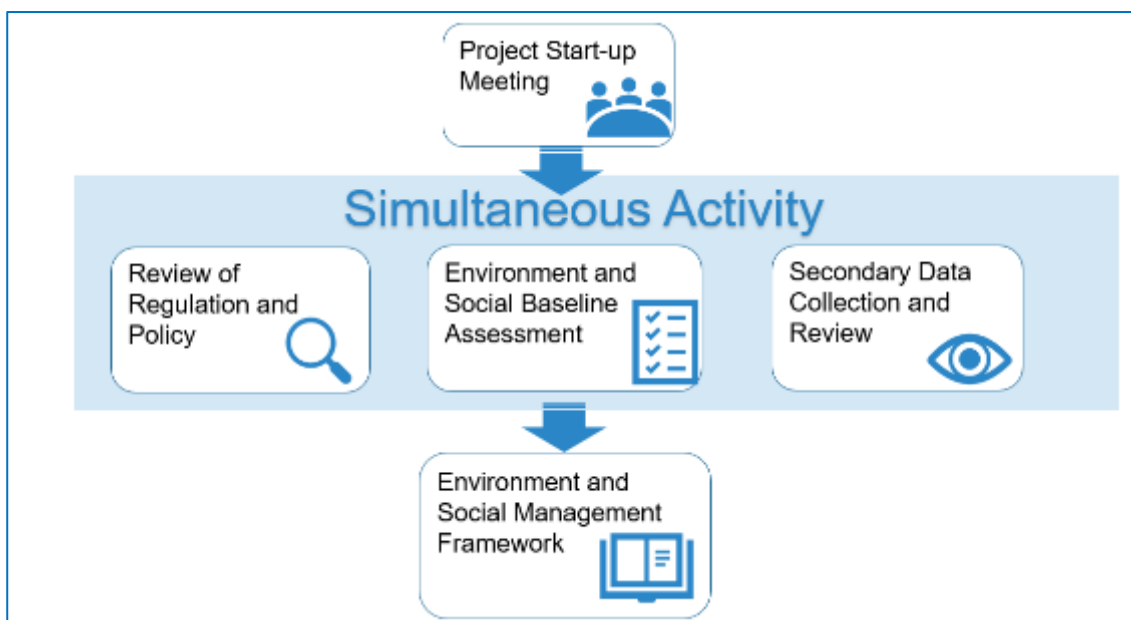
The approach and methodology for the project proposed by MM was finalised through a series of interactions and meetings with PCMU and the WB. This included the meeting with the subject experts from PCMU to gain a better understanding of the activities proposed under SMART. The strategy also considered the review of the secondary literature related to the agriculture sector and the current status and challenges facing the sector. The meeting at PCMU was later followed by a joint meeting of PCMU, WB and MM at the PCMU office in Pune. The suggestions and the outcome of the meeting further guided in finalising the approach and methodology for the study. This section presents the approach and methodology applied to undertake the Environmental and Social Management Framework (ESMF) of the SMART. The ESMF has been conducted in accordance with the World Bank Safeguards and Operational Principles and Indian regulatory requirements.

The purpose of this consultancy assignment is to:

- Conduct an Environment and Social Assessment (ESA) to identify and assess potential environmental and social impacts and risks in the implementation of the SMART project
- Based on findings of the ESA, prepare an Environment and Social Management Framework (ESMF), to avoid, minimize and mitigate potential adverse environmental and social impacts of the project's proposed interventions and enhance the potential positive environmental and social impacts of the project interventions.

Detailed Scope of Work is in **Appendix A**

**Figure 3: Brief Approach**



The detailed methodology for the assignment is as discussed in the subsequent sections.

### 2.1.1 Step I: Formulating strategy for conducting ESMF

MM presented a detailed strategy for conducting the ESMF in a joint meeting organised at PCMU. In a nutshell, the strategy revolved around identifying and understanding the key activities involved in each segment of the SMART, from the perspective of capturing the environmental and social issues and impacts. Stakeholder and institutional analysis formed an important part of this assessment that provided the context to the ESA and the framework. A major part of the assessment has been guided by the baseline study using research instruments like the sample survey and the focussed group discussions (FGDs). These instruments were finalised with the PCMU. Analysis of the information collected has given a shape to the understanding of the positive and adverse (social and environmental) impacts, which have been used for developing the environmental and social management framework for the project in the background of relevant national laws and the World Bank standards and policies.

### 2.1.2 Step II: Policy and regulations review

A large section of the report is based on the secondary research of nine Agri-climatic zones of Maharashtra, which included a desk review of the existing Acts, Regulations and Policy and Programs, Economic and Agriculture Surveys, at the country level, which will have applicability to the project. The section also aimed at highlighting, the compatibility of the existing Acts and Regulations to address the possible impacts from the project. Further, analysis of the applicability of the various World Bank Safeguards and Operational Policies (OPs) to be triggered were also analysed. This was followed by suitability of the various Indian Acts and Regulations in addressing the triggered World Bank Safeguards and OPs. The emerging gap analysis was used to interlink the impacts identified through the baseline and stakeholder analysis and identifying suitable mitigation measures. This analysis primarily reviewed the legal, regulatory and policy instruments related to various activities pertaining to the components to be taken under SMART.

### 2.1.3 Step III: Baseline Survey

The baseline survey comprised collection of data from secondary and primary sources. For the social assessment secondary data on demographic, social and economic profile of the population has been compiled from census 2011, planning commission and human development reports and presented subsequently in the report. The environment assessment involved secondary data collection on topography, geology and soil, climate and rainfall, bio-diversity and forest, land use pattern, water resources and quality, wetland, agricultural pests and crop diseases, irrigation, energy and food safety.

#### 1.3.1.1 Primary data collection

For collection of primary data, stakeholder consultations have been carried out. Stakeholder consultations were distributed among the consultant and project team for coverage in the respective zones. The checklists used for stakeholder consultations are in **Appendix B**. A social baseline assessment is primarily based on data received through six Productive Partnership (PP) plans covering 4811 households (22133 farmers) from nine districts and covering eight commodities.

#### 1.3.1.2 Data collection methodology

The data collection was carried out to ensure representation of the nine Agro-climatic zones of the State. In each zone, 2 to 3 districts were represented for coverage wherein the Agriculture Department and officials from Agricultural Technology Management Agency (ATMA) were contacted to identify major crops and FPCs for coverage in this assignment. Care was taken to ensure that crops for which interventions were planned under the Project were covered during

the field visits. The overall sampling covered is 170 stakeholders among FPCs and MAVIM and MSRLM CBOs, APMC retailers and traders, goat rearing cooperatives, slaughter houses, private buyers and Bank officials. The stakeholder consultations covered 16 districts representing 24 commodities. The social assessment for eight commodities was carried out using questionnaires and focus group discussions.

#### 2.1.4 Step IV: Impact identification

Based on the primary review, stakeholder analysis and secondary literature review, the impacts were categorised under the social and environmental heads. An attempt has also been made to identify the impacts and classify them into positive and negative impacts. For the purpose of categorisation of the impacts a simple methodology has been used, which also captures the stage at which the impacts are likely to emerge during the project implementation. The impact identification has also tried to capture the following:

- Identify and prepare an inventory of possible direct and indirect
  - positive impacts that could be enhanced/ upscaled/ replicated further and
  - negative impacts and options for appropriate mitigation measures
- Suggest cost effective alternative approaches (wherever possible), such as use of environment-friendly materials, to prevent negative impacts and suggest ways to enhance the participation of women, SC and STs in project implementation. While taking the impact identification measures forward, attempts have been made to explore measures to enhance the participation of tribal and other vulnerable sections and ensure that they access project benefits at par with others.

Additionally, the ESMF include:

- Strategies to help tribal, women and other vulnerable sections of the CBOs, who are actively involved in decision making so that they access project benefits at par with others.
- Measures required to support potential land losers (irrespective of their ownership of land), highlight their social economic profile, defining arrangement for alternate livelihood for the project affected people in the form of a resettlement action plan (RAP), if required in the case of land acquisition; etc.

While the national laws and regulations cover significant requirements, there is need for extra caution, on the part of the project implementing agency (PCMU and PIUs), which have been suitably addressed in the mitigation matrix.

#### 2.1.5 Step V: Environment and Social Management Framework and Institutional Framework Preparation

The environmental and social management framework has been developed for:

- Identifying institutional roles/responsibility for implementation, and its monitoring mechanism
- Developing project screening and exclusion criteria
- Integrating environmental and social management consideration at the various levels and stages of project implementation
- Developing external monitoring mechanism within the project for addressing the environmental and social impacts during the life cycle of the project

### 2.1.6 Study Limitation

- The coverage of CBOs, crops and stakeholders was limited to their availability during the primary data collection process through field visits.

The detailed findings and analysis from the assessments carried out are presented in the subsequent sections of this report.

## 3 Review of Environment and Social Legislation and Policies

In this section, the Consultants have reviewed relevant legislations of Government of India (GOI), local regulations of Government of Maharashtra, National and State Government schemes and policies of the World Bank to ascertain their compliance in the Project.

### 3.1 Applicable Environmental Rules and Regulations of Government of India

The list of central government regulations with respect to environment and its applicability is as indicated in the table below.

**Table 2: Applicable Central Environment Rules and Regulations**

| S. No | Name of relevant Act / Rule                                                                                              | Project Applicability                                                                                                                                                                                                                                                                                                                                                                     |
|-------|--------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | Environmental Protection Act (EPA) 1986                                                                                  | Applicable.<br>Since food processing industries are involved, operation of diesel generators in market, warehouse and cold storage involves air emission or water discharge, so this will attract EPA, 1986.                                                                                                                                                                              |
| 2     | Water (Prevention and Control of Pollution) Act, 1974 and Amended 1988                                                   | Applicable<br>Since the project involves support of establishments like food processing industries, cold storage, slaughter house which discharge water and wastewater. These will require permission under Water Act, 1974.                                                                                                                                                              |
| 3     | Air (Prevention and Control of Pollution) Act, 1981                                                                      | Applicable<br>Since the project involves support of establishments like food processing industries, cold storage, slaughter house which result in air emission. These will require permission under Air Act, 1981                                                                                                                                                                         |
| 4     | Hazardous and Other Waste (Management Handling and transboundary movement) Rules, 2016                                   | The Act is applicable since there will be use of Agro-chemical and fertilizers in the agricultural and other allied activities in the project area and the unused chemical and their containers and packages shall be disposed as per the provisions of this act.                                                                                                                         |
| 5     | Solid Waste Management Rules, 2016                                                                                       | Applicable since the investment includes setting up of warehouse, markets, cold storages, processing facilities and retails and hence the municipal waste generated from these facilities shall be handled as per SWM rules and any new construction activity shall comply with SWM Rules. The bidding contract with the corporates shall include adherence to provisions of these Rules. |
| 6     | Insecticide Act 1968 and Rules 1971                                                                                      | Applicable and the Farmers must source insecticides only from licensed suppliers. Farmers shall be trained on Personal Protective Equipment (PPE) to be used while handling insecticides and mode for disposal of unused insecticides and its containers.                                                                                                                                 |
| 7     | Fertilizer Control Order 1985                                                                                            | Applicable since the project will not support procurement of fertilizer from unauthorized vendors to be used for farming.                                                                                                                                                                                                                                                                 |
| 8     | Food Safety and Standards (Food Products Standards and Food Additives) Act 2006 and Rules, 2011 and subsequent amendment | Applicable since the investment will facilitate enhancement in agriculture-based commodities, processing and grading facilities, infrastructures such as market, warehouse, retail etc. Which will develop agri-business and agricultural productivity.                                                                                                                                   |
| 9     | Prevention of Cruelty to Animals (Slaughter House) Rules, 2001                                                           | Applicable since the project intervention includes slaughter houses, and backyard poultry, the Rule will be applicable, and guidelines of the rule shall be complied.                                                                                                                                                                                                                     |
| 10    | The Seeds Act, 1966                                                                                                      | Applicable since the project will support only procurement of certified seeds and truthfully levelled seeds. The Act will be also applicable in                                                                                                                                                                                                                                           |

| S. No | Name of relevant Act / Rule | Project Applicability                                                                |
|-------|-----------------------------|--------------------------------------------------------------------------------------|
|       |                             | case where mass procurement and distribution of seed is done through Producer Groups |

Source: MM secondary review

### 3.2 State Environmental Laws and Regulations

The list of state regulations with respect to environment and its applicability is as indicated in the table below.

**Table 3: Applicable State Environment Rules and Regulations**

| S. No | Name of relevant Act / Rule                                                          | Project Applicability                                                                                                                                                                   |
|-------|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | Maharashtra Water Policy 2003                                                        | The Policy guidelines shall be followed by promoting water conservation measures in the agriculture value chain                                                                         |
| 2     | Maharashtra Management of Irrigation System by Farmers Act 2005 and Rules thereunder | The guidelines of the Act shall be followed by promoting water conservation measures during farming and efficient use of irrigation water.                                              |
| 3     | Maharashtra Water Resource Regulatory Authority Act 2005                             | The guidelines of the Act on sustainable and efficient use of water shall be followed by promoting efficient and sustainable use of water during farming as well as in the value chain. |
| 4     | Maharashtra Ground Water (Development and Management) Rules                          | The Project shall ensure that the Act is complied with and necessary permission / approvals are obtained by the Project beneficiaries                                                   |
| 5     | Maharashtra Biological Diversity Rules, 2008                                         | The Project shall ensure that the Act is complied with and necessary permission / approvals are obtained by the Project beneficiaries                                                   |
| 6     | Maharashtra Felling of Trees (Regulation) Act, 1964                                  | The provision of the Act shall be complied in case felling of trees are required for any proposed expansion of warehouse or market or FPOs / FPCs.                                      |
| 7     | Maharashtra Agricultural Produce Marketing (Development and Regulation) Act, 1963    | The provisions of the Act shall be complied as the intervention includes Markets.                                                                                                       |
| 8     | Maharashtra Air (Prevention and Control of Pollution) Rules, 1983                    | The Rule shall be applicable since any expansion or modification which is likely to add emission to air environment shall require prior consent from the MPCB.                          |
| 9     | Maharashtra Water (Prevention and Control of Pollution) Rules, 1983                  | The Rule shall be applicable since any expansion or modification which is likely to add wastewater into the environment shall require prior consent from the MPCB                       |
| 10    | Maharashtra Pollution Control Board on Poultry and Cattle (Goat) Sheds               | The Project intervention includes slaughter houses and hence the guidelines of the circular shall be complied by the slaughterhouse proposed to be benefited by the Project.            |

Source: MM secondary review

### 3.3 Relevant Central and State Government Schemes and Programs on Environment

Centre and the State Governments have been implementing several schemes / programmes under Central Schemes, Centrally Sponsored Schemes and State Schemes, that are relevant to the project and can be leveraged in SMART project. Some of these schemes and their salient features are discussed below:

**Table 4: Relevant central and State Government Schemes and Programs on environment**

| Name of scheme / program               | Key features                                                                                                                                       |
|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| Pradhan Mantri Krishi Sinchayee Yojana | The scheme provides for expansion of cultivable area under assured irrigation, increase water use efficiency and adoption of precision irrigation. |

| Name of scheme / program                                                   | Key features                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Soil Health Card Scheme                                                    | The scheme aims at providing soil health card for farmers providing soil nutrient status and recommended dosage of nutrients.                                                                                                                                                                                                                                     |
| Neem Coated Urea                                                           | On 25th May 2015, Department of Fertilizers made it mandatory for all domestic producers of urea to produce 100 percent Neem Coated Urea with an extra MRP of 5 percent.                                                                                                                                                                                          |
| Smart Food Initiative founded by the ICRISAT                               | The Smart Food initiative is a global campaign for foods that ensure well-being of people and the environment along with better incomes for smallholder farmers of Asia and Africa.                                                                                                                                                                               |
| Strengthening & Modernization of Pest Management approach in India (SMPMA) | Strengthening and modernization of Pest Management Approach in India is a central sector scheme having components such as Integrated Pest Management, Locust Control and Research and Implementation of Insecticides Act.<br>IPM packages of practices has been developed for 87 crops. Posters, manuals and Farmer's guide has been prepared for rice and cotton |

Source: MM secondary review

### 3.4 Applicable social legislations

The list of relevant state and central government regulations with respect to social aspects and its applicability is as indicated in the table below:

**Table 5: Applicable social legislations**

| S. No. | Applicable Act                                                                                               | Key features                                                                                                                                                                                                                                                          | Relevance to Project                                        |
|--------|--------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|
| 1.     | The Right to Fair Compensation and Transparency in Land Acquisition Rehabilitation and Resettlement Act 2013 | The Act has provisions to provide fair compensation to those whose land is taken away, brings transparency to the process of acquisition of land to set up factories or buildings, infrastructural projects and assures rehabilitation of those affected.             | Applicable in case private land is acquired                 |
| 2.     | Child Labour (Prohibition and Regulation) Act, 1986                                                          | The Act prohibits employment of children below 14 years except in family enterprises provided it does not hamper the education of children. Adolescents (14-18 years) not to be employed in hazardous employment                                                      | Applicable to all project activities including construction |
| 3.     | Bonded Labour (Abolition) Act, 1976                                                                          | The Object of the Act is to provide for the abolition of bonded labour system with a view to preventing the economic and physical exploitation of the weaker sections of the people and for matters connected therewith or incidental thereto                         | Applicable to all project activities                        |
| 4.     | Minimum Wages Act, 1948                                                                                      | Requires the Government to fix minimum rates of wages and reviews this at an interval of not more than 5 years. Every employer shall be responsible for the payment to persons employed by him of all wages required to be paid under this act                        | Applicable to employers                                     |
| 5.     | Maharashtra Agriculture Produce Marketing Act, 1963                                                          | Under the earlier Act, the products had to be sold through APMC to provide additional venues for selling. The State government further amended the Act in 2018 to help ensure better rates for farmers through mutual agreements with sellers and supervised by MSAMB | Applicable to farmers                                       |
| 6.     | National seed Policy 2002                                                                                    | The Policy shall be applicable since the Project intervention are intended to support enterprise growth and expanding market access.                                                                                                                                  | Applicable to farmers                                       |

Source: MM secondary review

### 3.5 Relevant Central and State Government Social Schemes and Programs

A list of relevant social welfare schemes and their salient features are discussed below.

**Table 6: Relevant central and State Government Schemes and Programs**

| S. No. | Name of scheme / program                                             | Key features                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------|----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1      | National Policy for Farmers 2007                                     | Policy includes strategy of doubling farmers' income by 2022 with special focus on efficient irrigation system, quality seed, soil health, food chain value addition, crop insurance and ancillary activities.                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 2      | Pradhan Mantri Fasal Bima Yojana                                     | Scheme provides for reducing farmer distress by providing crop insurance for food crops, oil seeds and annual commercial and horticulture crops in the event of failure of any notified crop because of natural calamities, pests and diseases                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 3      | Paramparagat Krishi Vikas Yojana                                     | The scheme targets to form 10,000 clusters of 20 Ha each and bring nearly two lakh hectares of agriculture area under organic farming by 2017-18                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 4      | National Mission on Agricultural Extension and Technology under ATMA | Agricultural Technology Management Agency (ATMA) set up at district level is responsible to ensure delivery of extension services to farmers and looking after implementation of the scheme. The purpose of this mission is to reform and strengthen the agricultural extension to enable delivery of appropriate technology and improved agronomic practices to the farmers. It includes sub-missions on Agriculture Extension, Seed and Planting Material, Agricultural Mechanisation and Plant Protection.                                                                                                                                                                              |
| 5      | e-National Agriculture Market (e-NAM)                                | e-NAM is a pan India electronic trading portal developed under the National Agriculture Market scheme. States are required to carry out pre-requisite reforms to enable a single license to be valid across the state, single point levy of market fee and provision for electronic auction as a mode of price discovery                                                                                                                                                                                                                                                                                                                                                                   |
| 6      | Integrated Scheme for Agriculture Marketing (ISAM)                   | The scheme provides for promotion of Agri-marketing through creation of marketing and agribusiness infrastructure including storage.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 7      | Mission for Integrated Development of Horticulture (MIDH)            | MIDH is a centrally sponsored scheme for the holistic growth of horticulture sector covering fruits, vegetables, root and tuber crop, mushroom, spices, flowers, aromatic plants, coconuts, cocoa and bamboo by research, technology promotion, extension, post harvesting management, processing and marketing.                                                                                                                                                                                                                                                                                                                                                                           |
| 8      | Agri Udaan scheme                                                    | The Central Government has launched Agri Udaan Food and Agribusiness Accelerator 2.0 to promote innovation and entrepreneurship in agriculture. Accelerators are 4 – 8 months program aiming at scaling up innovative start-ups with a working prototype and initial market traction. This is done through education, mentorship, and financing. Start-ups enter accelerators for a fixed-period of time, and as part of a cohort. The cohort is shortlisted by evaluation panel comprising of industry veterans, business experts, R&D scientists. Four distinct factors that make accelerators unique are fixed term, cohort based, mentorship driven, and they culminate into demo day. |
| 9      | Minimum Support Price Scheme                                         | To make the agricultural activity viable as well as to protect the farmers' economy from natural calamities and low prices offered by traders, Government of India declares Minimum Support Prices (MSP) for selected crops. Under the scheme, procurement in the State is undertaken by Maharashtra State Co-operative Marketing Federation, Maharashtra State Co-operative Tribal Development Corporation, National Agricultural Co-operative Marketing Federation and Maharashtra State Co-operative Cotton Growers Federation                                                                                                                                                          |
| 10     | Sub-mission on seed and planting material                            | The scheme is being implemented in the State from 2014-15 through Maharashtra State Seeds Corporation, to get the quality/certified seeds at affordable prices and increase production. Under the scheme, 50 percent assistance is provided for cereal crops and 60 percent assistance is provided for pulses & oilseeds crop for one-acre area per farmer for distribution of certified seeds.                                                                                                                                                                                                                                                                                            |

Source: MM secondary review

### 3.6 Applicable Acts in India for protection of women's rights

The legal provisions to uphold the rights of women as mandated by the constitution of India is discussed under this section. The main applicable Acts that have special provisions for the safeguarding of women's interests have been presented in table below:

**Table 7: Legal Provisions for Safeguard of Women**

| S. No. | Applicable Act                                                                                           | Key features                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Relevance to Project                                                                                                                                                                         |
|--------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.     | Maternity Benefit (Amendment) Act, 2017                                                                  | <ul style="list-style-type: none"> <li>Twenty-six weeks of paid maternity leave for mothers; for adoptive mothers 12 weeks of maternity leave from date of adoption</li> <li>The enabling provision to 'work from home' can be exercised after expiry of 26 weeks leave</li> <li>The Act has mandated creche facilities for all establishments employing 50 or more employees; the women employee should be permitted to visit the facility, four times during the day</li> <li>The amendment makes it compulsory for the employers to educate women about the maternity benefits at the time of appointment</li> </ul>                                                                                                                                                                                                                                                                                                                                 | Applicable to staff working and institutions established under project                                                                                                                       |
| 2.     | The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act                  | <ul style="list-style-type: none"> <li>This Act defines sexual harassment at the workplace and creates a mechanism for redress of complaints and applicable to public, private, organized and unorganized sectors.</li> <li>The employer is expected to constitute an internal complaint committee with 10 or more employees at every workplace</li> <li>The enquiry process under the Act should be confidential and breach of this confidentiality could be penalized for Rs.5000</li> <li>The act requires the employer to educate and sensitize employees and develop related policies</li> <li>Non-compliance of the provisions of the Act is punishable up to Rs. 50,000</li> <li>The district officer is required to constitute a district-wise complaint committee; the committee will complete the inquiry within a time of 90 days</li> <li>The internal complaint committee have the power of civil courts for gathering evidence</li> </ul> | Applicable to the proposed project interventions in work places such as CBOs, warehouses, food processing industries, retails, construction sites, farming etc. where women will be employed |
| 3.     | Government Resolution of 1992, Revenue and Forest Department, Amendment to Maharashtra Revenue Act, 1966 | <ul style="list-style-type: none"> <li>The resolution, popularly known as Laxmi Mukti (emancipation of wealth of women) gives the right to women to register their names along with men on the property ownership 7/12 record subject to the conditions:</li> <li>'owner' must be the legally wedded husband of the woman who will be a co-owner</li> <li>the wife be legally wedded to the owner of the land who is her husband</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Applicable to all beneficiaries under the project                                                                                                                                            |
| 4.     | Equal Remuneration Act, 1976                                                                             | It is the duty of an employer to pay equal remuneration to men and women workers for same work or work of a similar nature.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Women engaged for project supported activities should be paid on par with men                                                                                                                |

Source: MM secondary review

The remaining list of legislations and programs as outlined above are in **Appendix C**.

### 3.7 Government of India Schemes

A compilation of various central government schemes implemented by the respective departments on empowerment, social security, skill development, income generation, agriculture is provided in the following:

**Table 8: Government of India Schemes and Programs for Welfare of Women**

| S. No. | Department / Ministry        | Schemes / programs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.     | Women and Child Development  | <p>Pradhan Mantri Mahila Shakti Kendra for empowerment of rural women</p> <p>National Creche scheme with day care facilities to children aged six months to six years for employed women</p> <p>Rastriya Mahila Kosh (RMK) for providing micro credit to women for income generation</p> <p>Working women's hostels</p> <p>One stop centres and Women Helpline for facilitating access to services on medical aid, police, legal and psychosocial counselling and temporary support service for women affected by violence</p> <p>Gender Budgeting for strengthening institutional mechanisms and training stakeholders on mainstream gender concerns</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 2.     | Agriculture                  | Agricultural Technology Management Agency (ATMA) aims at operationalizing extension reforms for farmers; gender budgeting enunciates that at least 30 percent of the resources are utilized for women farmers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 3.     | Rural Development            | <p>National Rural Livelihood Mission (NRLM) – program covers empowering women through Self Help Group (SHG) development across the country. The scheme aided by World Bank provides access to loans for women at lower interest rates</p> <p>Deen Dayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY) – a part of NRLM, the scheme caters youth who are in 15-35 age group to enhance employability through skill training</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 4.     | Ministry of Tribal Affairs   | <p>Institutional Support for Development and Marketing of Tribal Products / Produce – the activities to be carried out under the scheme are marketing support, supply chain infrastructure development and research and development on promoting innovations and technologies. The scheme involves networking with the Department of Agriculture. The State departments who would implement the program are State Tribal Development Cooperative Corporation, State Forest Development Corporation and Minor Forest Produce (trading and development) federations</p> <p>Revision of Minimum Support Price (MSP) for Minor Forest Produce (MFP) - At the State level, Tribal Development Department, Government of Maharashtra is implementing the program</p> <p>Introduction of new MFP items into the Centrally Sponsored Scheme titled, 'Mechanism for Marketing of Minor Forest Produce (MFP) through Minimum Support Price (MSP) and development of Value Chain of MFP' – linkage with existing warehouses is the key focus of the program; the Maharashtra State Cooperative Tribal Development Corporation (Nasik) and forest department are involved in implementation of the program</p> |
| 5.     | Ministry of Minority Affairs | Nai Roshni – providing knowledge, tools and techniques for interacting with government systems, banks and other institutions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

Source: MM secondary review

### 3.8 Applicable World Bank Safeguard Policies

The Project has been reviewed with respect to the World Bank's operational policies to help assess the possible environmental risks and impacts associated with development intervention proposed for agriculture and animal husbandry. WB safeguards help in defining measures and the processes to effectively manage risks and enhance positive impacts. The process of applying safeguard policies can be an important opportunity for stakeholders' engagement, enhancing the quality of project proposals and increasing ownership. WB's operational policies applicable to the Project are as indicated in the table below.

**Table 9: Applicable World Bank Safeguard Policy**

| <b>Policy</b>                                                        | <b>Applicability</b>                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>OP 4.01 – Environmental Assessment</b>                            | <b>Applicable</b><br>EIA and EMP is required prior to construction of facilities. Construction Management Guideline has been prepared as part of the report which includes EMP to be complied by the Contractor responsible for construction activity.                                                                                                                   |
| <b>OP 4.03 – Performance Standards for Private Sector Activities</b> | <b>Not Applicable</b><br>No activity in this project is designed, constructed, operated and/or owned by private entity hence the private entity is not responsible for identifying and assessing the environmental risks in this project.                                                                                                                                |
| <b>OP 4.04 – Natural Habitat</b>                                     | <b>Not Applicable</b><br>The Project is not investing in any activity that will result in degradation or conversion of critical habitat and not investing in activities inside protected areas. Further the Project is not supporting any activity that deals with produce sourced from forest.                                                                          |
| <b>OP 4.09 – Pest Management</b>                                     | <b>Applicable</b><br>The project will not support use of pesticides banned by the WHO and Indian regulations. A Pest Management Plan has been developed and included in the report.                                                                                                                                                                                      |
| <b>OP 4.10 – Indigenous People Development Plan</b>                  | <b>Applicable</b><br>Due Diligence as per ESMF and world bank policy needs to be conducted to avoid impact on indigenous people in 13 districts notified as tribal districts by the government                                                                                                                                                                           |
| <b>OP 4.12 – Involuntary Resettlement</b>                            | <b>Applicable</b><br>Due diligence as per ESMF and world bank policy needs to be conducted to avoid any impact related to involuntary resettlement before taking possession of land or assets whether it is government or private in nature.<br><br>This is also irrespective of whether the possession is taken on lease, temporary, permanent or complete acquisition. |

Source: MM Analysis

### 3.9 Negative List of Activities

Based on the review of relevant regulations of GOI, GOM and policies of World Bank, a list of negative activities that will not be supported under SMART Project is indicated below.

**Table 10: Negative List of Activities**

| <b>Intervention Stage</b>                       | <b>Activities Not to be Supported</b>                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Primary Production                              | <ul style="list-style-type: none"> <li>● Use of pesticides banned by GOI, pesticides listed in Class Ia, Ib, Class II WHO.</li> <li>● Use of pesticides from sources not licensed for the same.</li> <li>● Use of uncertified seeds or non-Truthfully Labelled seeds.</li> <li>● Burning of crop residue</li> <li>● Use of high energy consuming processing equipment like polluting DG sets, outdated tractors, outdated harvesters, outdated reefer van etc.</li> </ul> |
| Back yard poultry and rearing of Goat and Sheep | <ul style="list-style-type: none"> <li>● Open grazing of Goat or Chicken Birds in the forest areas is prohibited completely.</li> <li>● Allowing non- vaccinated animals or diseased /ill animals to enter and range freely in the forest areas.</li> </ul>                                                                                                                                                                                                               |
| Market / Retail / Slaughter House               | <ul style="list-style-type: none"> <li>● Activities involving unsanitary disposal of solid waste generated in the market.</li> <li>● Markets without proper drainage facility.</li> <li>● Operating Slaughter house without abattoir waste and ETP facility.</li> </ul>                                                                                                                                                                                                   |
| Forest Protection                               | <ul style="list-style-type: none"> <li>● Diversion of Forest Land to the purpose of the project is completely prohibited.</li> <li>● Extraction, transportation, processing and sale of forest produces, or any commodity selected under SMART and produced in forest land shall be completely prohibited.</li> </ul>                                                                                                                                                     |
| Others                                          | <ul style="list-style-type: none"> <li>● Release of genetically altered organisms into the natural environment,</li> <li>● Radioactive products</li> <li>● Tobacco, unmanufactured or manufactured</li> <li>● Tobacco processing machinery</li> </ul>                                                                                                                                                                                                                     |

Source: MM Analysis

## 4 Social and Environmental Baseline

Agriculture and allied activities sector contribute to overall growth by generating requisite inputs. The share of this sector in the total Gross State Value Added (GSVA) is declining over the period resulting in cascading impact on other sectors like Agri-processing industries, trade, hotels and restaurants. Although the State is one of the most industrialised states in the country, agriculture and allied activities sector is still predominant in the State with economy thus being primarily agrarian, and about 55 percent of the population relying for livelihood. Dependency on weather conditions, increasing number of marginal and small farmers and reduction in the area of operational holdings, high expenses leading to non-profitability and market uncertainty continues to be the prime concerns plaguing the sector in the State.

This section profiles the socio-economic and environmental baseline within which the SMART is to be implemented. The baseline captures key trends and implications of social indicators in the context of the agricultural sector in transition. These indicators and implications need to be seen in the context of:

- Inherent limitation of sampling and the sample size, which though statistically significant, is limited to nine districts, and partially dependent on secondary data;
- Increasing commodity prices during the survey creating a possible bias in the feedback received from stakeholders. The baseline has been divided into social and environmental sections. While some of the issues have specifically been covered under the separate sections, other issues may have implications for both the social and environmental baseline.

### 4.1 Socio-economic baseline and context

This section discusses the socio-economic baseline that is currently prevailing across state's agro-pastoral landscapes. The issues discussed are based on analysis of the secondary data in addition to the household data and village-level information for all the 382 villages (52 talukas) as well as anecdotal evidence and primary consultations with key stakeholders within the institutional set-up and the CBO structure. All the social implications for the SMART are discussed wherever relevant.

#### 4.1.1 Demographic Profile

The parameters covered under demographic profile were, total population disaggregated into urban-rural, males-females, average household sizes, population density and growth in population. The data reveals that the State contributes, 9.28 percent of the total national population with an average household size of 4.6 against the national average of 4.9. The rural population is pre-dominant (69 percent) over urban population at the national level but in Maharashtra, rural population, is comparatively lower at 55 percent.

Male population is slightly higher than female population. The population density is lower in Maharashtra at 365 persons per sq.km as compared to the national average of 382 persons per sq.km. and within Maharashtra, it is the lowest in rural areas.

The demographic data, comparing Maharashtra with National level across key indicators is presented in the table below:

**Table 11: Demographic Profile at State and National level**

| S. No. | Indicators                                                 | India             | Maharashtra       | Rural Maharashtra |
|--------|------------------------------------------------------------|-------------------|-------------------|-------------------|
| 1.     | Population (in crores)                                     | 121.08            | 11.2              | 6.15              |
| 2.     | Average household size                                     | 4.9               | 4.6               | 4.5               |
| 3.     | Urban population (in crores / percent to total population) | 37.7 (31 percent) | 5.08 (45 percent) | 5.08 (45 percent) |
| 4.     | Rural population (in crores / percent to total population) | 83.3 (69 percent) | 6.15 (55 percent) | 6.15 (55 percent) |
| 5.     | Percent of males to total population                       | 51.47             | 51.83             | 51.23             |
| 6.     | Percent of females to total population                     | 48.53             | 48.17             | 48.76             |
| 7.     | Population density (persons / sq.km)                       | 382               | 365               | 211*              |
| 8.     | Decadal growth (in percent)                                | 17.64             | 16.0              | 10.36 percent     |
| 9.     | Transgender Population in numbers                          | 487,803           | 40,891            | Not available     |

Source: Primary Census Abstract, 2011; NSS Report No.554, Employment and Unemployment Situation in India 2011-12

\* Note: Data available in 31 out of 33 districts only

Among the districts in Maharashtra, major contributors to population are the districts of Thane (9.84 percent), Pune (8.39 percent) and Mumbai suburban (8.33 percent).

The population density is highest in Mumbai suburban (20,980 persons per sq.km), Mumbai (19,652 persons per sq.km) and Thane (1157 persons per sq.km). The district with lower density Chandrapur (193 persons per sq.km).

Regarding rural and urban population distribution, it is noteworthy that the rural population is highest in the districts of Gadchiroli (88.9 percent), Sindhudurg (87.4 percent) and Hingoli (84.2 percent). Since the project focus will be on the rural population, the district-wise data on all the above parameters including rural population as provided in **Appendix D** could be utilized to prioritize the focus areas for intervention.

### 1.3.1.3 Relevant social baseline primary data

The total population covered by the household survey of 4811 households is 22133. The representatives of the households that were engaged for the study were heads of households in 29 percent, and more than 70 percent women in most of the cases. The highest proportion of female respondents were observed in the Hingoli district (6188 respondents), followed by Satara (4489) and Yavatmal (3544). In terms of the characteristics of households, among the 4426 households surveyed, the average household size is 4.6, which is close to national average size of 4.45. Majority (65-70 percent) of the members from each household were in the productive age group of 20-60 years. Women-headed households (WHH), a key indicator of vulnerability, constituted 7 percent of the sample size. The detailed sample size coverage is as follows:

**Table 12: Sample size coverage**

| District | Number of Villages | Number of Farmers |        |
|----------|--------------------|-------------------|--------|
|          |                    | Male              | Female |
| Hingoli  | 60                 | 46                | 6188   |
| Hingoli  |                    |                   |        |
| Parbhani | 25                 | 401               | 137    |
| Nanded   |                    |                   |        |
| Sangli   | 37                 | 629               | 4489   |

| District     | Number of Villages | Number of Farmers |              |
|--------------|--------------------|-------------------|--------------|
|              |                    | Male              | Female       |
| Satara       |                    |                   |              |
| Yavatmal     | 20                 | 0                 | 3544         |
| Latur        | 154                | 3356              | 663          |
| Ahmednagar   | 59                 | 1191              | 568          |
| Aurangabad   | 27                 | 815               | 106          |
| <b>Total</b> | <b>382</b>         | <b>6438</b>       | <b>15695</b> |

Source: Productive Partnership data of the field survey

#### 4.1.2 Social Profile

Parameters covered under social profile are sex ratio, literacy rates and composition of SC and ST population in the total population. It is alarming that the State has a lower sex ratio (number of females per thousand males') of 929 against the national average of 943.

Literacy rates are far higher at 82.30 percent against the national literacy rate of 63.06 percent; similar is the case of female literacy rate wherein it is 75.9 percent in Maharashtra and 55.97 percent in India. The female literacy levels are comparatively lower to male literacy rate of 88.4 percent at the State level and lower in rural areas.

While SC population is lower in the state than at national level, ST population is slightly higher than at the national level, especially in rural areas. A comparative presentation of the state profile across selected indicators is presented in the following table:

**Table 13: Social Profile at State and National level**

| S. No | Indicator                                                                   | India | Maharashtra | Rural Maharashtra |
|-------|-----------------------------------------------------------------------------|-------|-------------|-------------------|
| 1.    | Sex ratio                                                                   | 962   | 929         | 959               |
| 2.    | Literacy rate ( percent to total population)                                | 63.06 | 82.30       | 77.00             |
| 3.    | Literacy rate among female population ( percent to total female population) | 55.97 | 75.90       | 64.80             |
| 4.    | Literacy rate among male population ( percent to total male population)     | 69.76 | 88.40       | 85.15             |
| 5.    | SC population (in percent to total population)                              | 16.63 | 11.81       | 12.17             |
| 6.    | ST population (in percent to total population)                              | 8.61  | 9.35        | 14.63             |

Source: Primary Census Abstract, 2011

Within the districts, those with lower sex ratio are Mumbai (832), Mumbai suburban (860) and Thane (886); and districts with higher sex ratio are Ratnagiri (1122), Sindhudurg (1036) and Gondia (999).

Literacy rates are highest in the districts of Mumbai suburban (89.91 percent), Mumbai (89.2 percent) and Nagpur (88.39 percent). Female literacy rates are the lowest in the districts of Nandurbar (56.47 percent), Jalna (60.95 percent) and Parbhani (63.63 percent)

SC population composition in total population is higher in rural Maharashtra and highest in the districts of Akola (20.07 percent), Washim (19.17 percent) and Nanded (19.07 percent).

ST population composition in total population is highest in the districts of Nandurbar (69.28 percent), Gadchiroli (38.71 percent), Dhule (31.56 percent) and Nashik (25.62 percent). The detailed district-wise findings are in **Appendix D**.

### 1.3.1.4 Relevant social baseline primary data

The primary survey findings on related parameters are presented in the following. The table below illustrates the caste profile of the study sample and indicates that most of the households are from the General Castes.

**Table 14: Caste Composition of Samples covered**

| Caste                            | Number of Households | Proportion in the Sample |
|----------------------------------|----------------------|--------------------------|
| General/Others                   | 2358                 | 49 percent               |
| Other Backward Castes            | 836                  | 17 percent               |
| Scheduled Castes                 | 922                  | 19 percent               |
| Scheduled Tribes                 | 296                  | 6 percent                |
| Nomadic Tribe (primitive tribal) | 397                  | 8 percent                |

Source: Productive Partnership data of the field survey

### 4.1.3 Occupational Profile

As per the Maharashtra Human Development Report, 2012, the State has fared consistently well in terms of economic growth. The State has the largest per capita net (PCN) and State Domestic Product (SDP) in the country. The growth in the State has been urban centric and non-agricultural, having visible pockets of urban affluence with shades of poverty and a continuing inflow of migrants. The primary sector has continued to be the major source of livelihood in terms of employment despite its falling share in output, while the secondary and tertiary sectors have shown uneven growth performances. Weakness of the state has been uneven distribution of gains from economic growth with inter-district disparities in growth performances.

This becomes evident in assessment of parameters of workforce participation rate (WPR), main and male workers among working population, workforce in primary sector and population below poverty line in rural and urban areas. Overall, data shows that WPR is higher at 43.99 as compared to the national WPR of 39.8. Main workers constitute persons who have worked for six months or more during the last one year preceding the date of enumeration in any economically productive activity. It is noteworthy, that main workers comprise 89.8 percent of the working population and males constitute 56 percent of the working population.

Cultivators / farmers and agricultural labourers have been combined, as workers in primary sector for this analysis. Thus, primary sector workers constitute more than 60 percent of the workforce in all the districts except in urban districts such as Mumbai, Mumbai suburban, Nagpur, Thane and Pune.

The population below poverty line is lower (17.35 percent) as against the national data of 21.92 percent. It is noteworthy that the BPL population in urban areas is much lower at 9.12 percent than that of rural population at 24.22 percent. A comparative profile of the state compared against national level is presented in table below:

**Table 15: Economic profile at State and National levels**

| S. No. | Indicators                                                                | India | Maharashtra |
|--------|---------------------------------------------------------------------------|-------|-------------|
| 1.     | Workforce participation rate ( percent to total population)               | 39.8  | 43.99       |
| 2.     | Main Workers to total population ( percent to total working population)   | 75.2  | 89.8        |
| 3.     | Male Workers to total population ( percent to total working population)   | 68.9  | 56          |
| 4.     | Female Workers to total population ( percent to total working population) | 25.6  | 34.1        |
| 5.     | Workforce in primary sector ( percent to total working population)        | 54.6  | 52.7        |

| S. No. | Indicators                                                         | India | Maharashtra |
|--------|--------------------------------------------------------------------|-------|-------------|
| 6.     | Work participation rate among transgenders                         | 34    | 38          |
| 7.     | Population below poverty line ( percent to total population)       | 21.92 | 17.35       |
| 8.     | Rural Population below poverty line ( percent to total population) | 25.7  | 24.22       |
| 9.     | Urban Population below poverty line ( percent to total population) | 13.7  | 9.12        |

Source: Primary Census Abstract, 2011, Planning Commission 2011-12 and Maharashtra Human Development Report 2012

Lower worker participation rates were observed in Mumbai suburban (39.92), Nagpur (40.15) and Mumbai (39.63); higher WPR were observed in Gadchiroli (54.45), Gondiya (50.31) and Bhandara (49.76). The detailed district-wise data are presented in **Appendix D**.

It is discouraging to note that female workforce participation rate in rural Maharashtra which was higher until 2001 has declined in the 2011 census data. The distribution of female WPR until 2001 is presented below:

**Table 16: Women workforce participation rates – time series data**

| Years | India | Maharashtra |
|-------|-------|-------------|
| 1961  | 31.39 | 46.74       |
| 1971  | 13.26 | 24.39       |
| 1981  | 23.18 | 40.85       |
| 1991  | 26.67 | 46.05       |
| 2001  | 24.8  | 42.52       |

Source [http://www.indusedu.org/pdfs/IJRMEC/IJRMEC\\_908\\_30489.pdf](http://www.indusedu.org/pdfs/IJRMEC/IJRMEC_908_30489.pdf)

#### 1.3.1.5 Poverty levels

Poverty levels have been assessed based on composition of people living below the poverty line (BPL). The Planning Commission of India has estimated the percent of BPL population in 2011-12 at the national level is 21.9 percent. The corresponding estimate for Maharashtra is 17.4 percent which is marginally lower but there is a huge disparity in terms of poverty in rural areas and poverty among urban and rural population. This is also affirmed by the census 2011 secondary data enlisted.

From the primary survey it is observed that among the marginal farmers ST and women households covered had BPL ration card. Similarly, the households with BPL ration cards were higher among small farmers too. Households with monthly income lower than INR 5000 were observed among small and marginal farmers only; similarly, households with monthly incomes between INR 5000 – 10000 were prevalent among small, marginal and semi-medium farmers only.

#### 4.1.4 Operational holdings

The analysis of the socio-economic baseline has attempted to understand the significance of influence of landholdings and landownership on several aspects of the agriculture sector, such as agriculture-based income, participation, ownership of land among women etc. The respondents /households have been categorized as per the agricultural census and is based on just the operational land holding size:

- Marginal farmers with less than 1 Ha of land

- Small farmers with 1 to 2 Ha of land
- Semi-medium farmers with 2 to 4 Ha of land
- Medium farmers with 4 to 10 Ha of land
- Large farmers with over 10 Ha of land

### 1.3.1.6 Size of Landholding

The data from agricultural census 2015-16 reveals that in a total of 146 million operational holdings in the country, the third highest number of operational holders belonged to Maharashtra at 14.71 million. The landholding pattern in Maharashtra shows that more than half (51.39 percent) of the farmers have marginal landholdings, followed by 29.33 percent of the farmers with small landholdings and 14.39 percent and 4.47 percent with semi-medium and medium landholdings respectively. Only 0.41 percent of the farmers have large landholdings. The same pattern of landholdings can be observed at the national level too. The detailed findings are in table below:

**Table 17: Percentage of Operational Holdings by size for all social groups**

| S. No. | Size                         | India | Maharashtra |
|--------|------------------------------|-------|-------------|
| 1.     | Marginal (below 1.00 Ha)     | 68.52 | 51.39       |
| 2.     | Small (1.00 - 2.00 Ha)       | 17.69 | 29.33       |
| 3.     | Semi-medium (2.00 – 4.00 Ha) | 9.45  | 14.39       |
| 4.     | Medium (4.00 – 10 Ha)        | 3.76  | 4.47        |
| 5.     | Large (10.00 Ha and above)   | 0.57  | 0.41        |

Source: Agricultural census, 2015 – 16

Though the data for the sample size is not available, however, as per the economic census (2015-16), number of operational holdings and area of operational holdings in the state was reported at 1.53 crore and 2.05 crore Ha as against 0.50 crores and 2.12 crore Ha respectively, as compared to the first Agriculture Census (1970-71). Over this period, the average size of holding decreased from 4.28 Ha to 1.34 Ha. The operational holdings and area of operational holdings in the State as per the Agriculture Census 2015-16 is given in table below. The average size of holding for SC and ST was 1.24 Ha and 1.76 Ha respectively. The share of female operational holders was 14.07 percent with 1.22 Ha of average size of holding:

**Table 18: Operational holdings and area in Maharashtra**

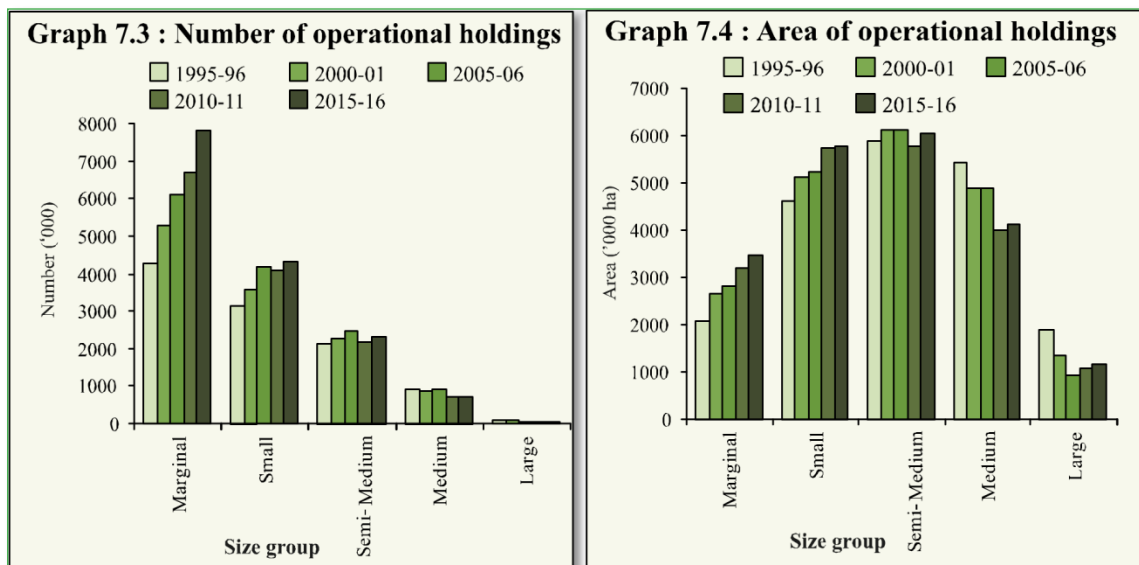
| Size lass (ha)          | No. of operational holdings ('000) |          | Area of operational holdings ('000 Ha) |          |
|-------------------------|------------------------------------|----------|----------------------------------------|----------|
|                         | 2010-11                            | 2015-16* | 2010-11                                | 2015-16* |
| Marginal (up to 1.0)    | 6,709                              | 7,816    | 3,186                                  | 3,449    |
| Small (1.0 - 2.0)       | 4,052                              | 4,339    | 5,739                                  | 5,771    |
| Semi-Medium (2.0 - 4.0) | 2,159                              | 2,327    | 5,765                                  | 6,025    |
| Medium (4.0 - 10.0)     | 711                                | 734      | 3,993                                  | 4,099    |
| Large (10.0 and above)  | 68                                 | 69       | 1,084                                  | 1,162    |
| Total                   | 13,699                             | 15,285   | 19,767                                 | 20,506   |

Source: Commissionerate of Agriculture, GoM

\* Provisional

The time series data on number of operational holdings and area of operational holding for the state is given in figures below:

**Figure 4: Operational holdings and area in Maharashtra**

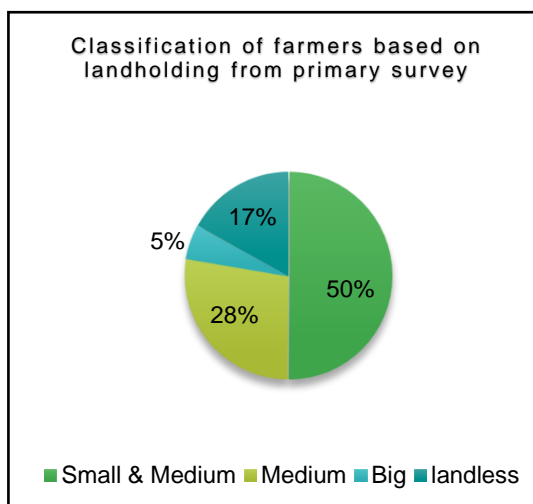


Source: Commissionerate of Agriculture, GoM

\* Provisional

**1.3.1.7 Relevant social baseline primary data**

It should be noted that this analysis also considers landless households (15 percent), and details of women with legal land ownership (9 percent). For the sake of simplicity and convenience, the analysis has included marginal and small farmers together. The figure below provides an illustrative break-up of the proportion of each of these categories in the sample and indicates that most of the respondent households (50 percent) comprise of marginal and small farmers owning up to two hectares of land or less:



**Profile of the Agricultural Farmers**

More than 95 percent farmers are involved in agricultural activities, with nearly 50 percent farmers from the marginal farmers, with up to 1 Ha of land. The numbers for the disadvantaged groups in the study area were 19 percent (SC) and 6 percent (ST). The study also covered nomadic tribes (primitive tribal groups), which constituted around 8 percent.

**4.1.5 Land-Use**

Land-use has important implications for agriculture development within India and state where traditional “crop-livestock mixed farming” is sustained with local inputs. The anthropogenic pressures on land-use in the state, in terms of its rate and intensity are evident in the changing patterns provided in table below especially for forest land as well as net sown area.

**Table 19: Select Land-use patterns in Maharashtra as a proportion to Geographical Area**

| Land-Use                                 | 2000-2001     | 2010-11       | 2017-2018     |
|------------------------------------------|---------------|---------------|---------------|
| Forest Area ( percent)                   | 16.70 percent | 16.70 percent | 16.80 percent |
| Area under non-agricultural use          | 4             | 5             | 5             |
| Barren uncultivable land                 | 5             | 6             | 6             |
| Permanent Pasture and Other Grazing Land | 4             | 4             | 4             |
| Fallow (current) land                    | 4             | 4             | 5             |
| Net Area Sown                            | 58            | 57            | 55            |
| Gross cropped area                       | 70            | 75            | 76            |

Source- Economic Survey of Maharashtra, 2018-19

The table depicts that of the total 307.58 lakh Ha geographical area of the State, the gross cropped area was 232.24 lakh Ha (76 percent), while the net area sown was 169.10 lakh Ha (55.0 percent):

- The sowing of Kharif (2018) was partially increased (0.05 percent from the previous year); the area under cereals, pulses and cotton decreased while area of oilseeds and sugarcane crop increased as compared to the last year. The production of cereals and pulses is expected to decrease by 6 percent and 35 percent respectively, while the production of oilseeds, cotton and sugarcane crops are expected to increase by 16 percent, 17 percent and 10 percent respectively as compared to the last year.
- Area under Rabi crops was 50 percent less compared to the previous year mainly due to deficient rainfall. The area of cereals, pulses and oilseeds decreased by 56 percent, 40 percent and 58 percent respectively as compared to the previous year.
- The area of summer crops was 0.84 lakh Ha, 41 percent less than the previous year (1.33 lakh Ha). Area under cereals, pulses and oilseeds decreased by 19 percent, 34 percent and 62 percent respectively. Horticulture holds on an average 30 percent share in Gross State Value Added (GSVA) of crop sector. The area and production decreased by 5 percent and 14 percent respectively.

Due to unavailability of primary data in the sample districts, data variation in land-use change could not be assessed. However, studies show marked variation in land-use change across different regions of India. For instance, in the northern states of Punjab, Haryana and Himachal Pradesh area under cultivation have reached the absolute limit of expansion. The growth of infrastructure, intensive cultivation, irrigation, and other technological factors are responsible for a major shift in cropping pattern towards rotational wheat and rice in Punjab (Singh, 2000). In Punjab, the cropping pattern has become highly energy-intensive and is affecting underground water resources.

#### 4.1.6 Agricultural Productivity of household

Based on a special study conducted with 51 randomly selected farmers, covering details on 1) land owned, 2) leased and 3) cultivated, reveals that nearly 5 percent of the households were involved in land leasing lower than one hectare. None of the households were using land on shared cropping. Efforts were made to collect data on crops and their productivity, however, the responses were inconsistent, and were given in variable measures like, tons, quintals and number of crates / boxes across acres, etc. This could be attributed to lack of awareness and inconsistent yields based on varying inputs. Hence this data could not be analysed and presented in a

coherent manner. The data from secondary sources on 20 crops cultivated in Maharashtra and their production data is provided in the following table for reference:

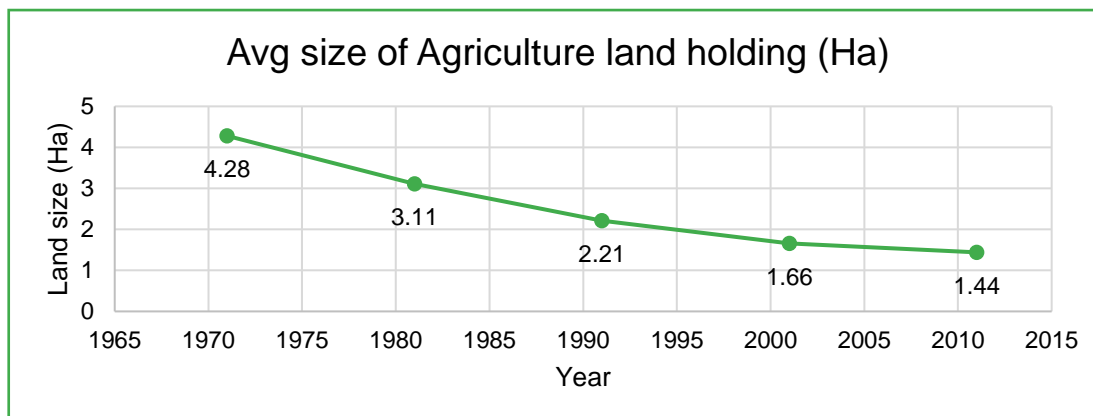
**Table 20: Crop / commodity production data in Maharashtra**

| Crop / commodity       | Area in ('000 Ha)   | Production ('000 MT)              | Year    | Farmers sale price (avg.)       | Consumers purchase price or Retailer's sale price (avg.) |
|------------------------|---------------------|-----------------------------------|---------|---------------------------------|----------------------------------------------------------|
| Bajra                  | 1,035               | 1,126                             | 2010-11 | Rs.15.2 per kg                  | Rs. 21.22 per kg                                         |
| Banana                 | 82                  | 3600                              | 2011-12 | Rs.439.8 per quintal            |                                                          |
| Cashew                 | 184.20              | 224.64                            | 2012-13 | Rs. 46,550 per quintal          | Rs.578.71 per kg                                         |
| Cotton                 | 41.46               | 74 lakh bales (yield 303 kg / Ha) | 2012-13 | Rs.45 per kg                    | Rs.61.62 per kg                                          |
| Flower - marigold      | 18.90               | 104.00                            | -       | -                               | -                                                        |
| Goat                   | 3531 ('000 numbers) | 273 (goat milk)                   | 2010-11 | -                               | -                                                        |
| Chickpea (bengal-gram) | 1,423               | 1,300                             | 2010-11 | -                               | -                                                        |
| Grapes                 | 86.0                | 774.0                             | 2010-11 | Rs.43 per kg                    | Rs.65.17 per kg                                          |
| Guava                  | 37                  | 322                               | 2011-12 | Rs. 13.4 per kg                 | Rs. 22.10 per kg                                         |
| Sorghum (Jowar)        | 4.05                | 2.67                              | 2011-12 | Rs.15.2 per kg                  | Rs.21.22 per kg                                          |
| Maize                  | 868                 | 2,518                             | 2010-11 | Rs.13.1 per kg                  | Rs.19.82 per kg                                          |
| Mango                  | 482                 | 503                               | 2011-12 | Rs. 5500 per quintal (alphonso) | Rs. 82.46 per kg                                         |
| Mosambi                | 99.00               | 245.00                            | 2012-13 | Rs.16.3 per kg                  | Rs.27.34 per kg                                          |
| Onion                  | 415.00              | 4905.00                           | 2010-11 | Rs.24.50 per kg                 | Rs. 39.53 per kg                                         |
| Orange                 | 133                 | 443                               | 2012    | Rs.19.2 per kg                  | Rs. 32.16 per kg                                         |
| Paddy (rice)           | 1,518               | 2,688                             | 2010-11 | Rs.1688.83 per quintal          |                                                          |
| Pomegranate            | 82.00               | 492.0                             | 2010-11 | Rs.45 per kg                    | Rs.68.01 per kg                                          |
| Red chillies           | 34604 ha            | 71749 tons                        | 2010-11 | Rs.39.5 per kg                  | Rs. 60.21 per kg                                         |
| Soybean                | 3010                | 3969                              | 2011    | Rs. 1,871 per quintal           |                                                          |
| Tomato                 | 52.00               | 738.00                            | 2010-11 | Rs.8.5 per kg                   | Rs. 16.29 per kg                                         |
| Pigeon pea (Tur)       | 1,301               | 976                               | 2010-11 | Rs. 41.1 per kg                 | Rs. 56.66 per kg                                         |
| Turmeric               | 13,876 ha           | 66,791 tons                       | 2010-11 | Rs.58.5 per kg                  | Rs. 86.52 per kg                                         |

Source: Departments of Agriculture, Animal Husbandry, Economics and Statistics, National Horticulture Board, Indian Horticulture Database, Spices Board

#### 4.1.7 Challenges faced in agricultural productivity

Most of the states' population is dependent on agriculture and allied sector for their livelihood, despite declining share in the total GSVA (about 12.2 percent during 2016-17 as against 15.3 percent during 2001-02). Reduction in average size of agricultural holdings (from 4.28 Ha to 1.44 Ha), and increase number of marginal and small farmers, and their dependency on monsoon and weather, are some of the key reasons put forward for low profitability - a major concern for the State.

**Figure 5: Time series data on average size of agricultural landholding (ha)**

Source: Vision 2030, Planning Department, Government of Maharashtra

Even though, the share of the allied activities in the agriculture and allied sector is comparatively less, its contribution to rural livelihood is high. The increasing consumption of fruits and vegetables, milk and milk products, poultry, meat and fish due to economic prosperity and consequent changing lifestyle indicates substantial potential for growth and should be tapped to for enhancing farmer's income.

The state's agricultural sector is dominated by small and marginal farmers, any commodity downturn significantly impacts them. Further, as agriculture in the State is diversified and relatively integrated with the global value chains, international prices of commodities like Soybean, Cotton, Sugar (covering 44 percent of the State's cropped area) strongly influence domestic prices. Commodities with little footprint outside the country are influenced by in-country trade policies. For instance, over the years, the prices of Pulses (which cover about 20 percent of the total cropped area in the State) while influenced by domestic consumption, were affected by the inconsistent trade policies of the Central Government. Thus, periodic farm distress in sectors linked to domestic and global markets is expected. With broad shifts in the global prices in commodities such as Pulses, Soybean, Sugar and Milk there are instances of farmers not even being able to cover their cost of production.

Women farmers face several additional barriers to the transition to high value agriculture and agribusiness. While ever more numbers of women are joining agriculture, they are less able to transition than men, and, further, their ownership of agricultural assets has stagnated. Unlike men who in addition to production, also serve as actors in the upper levels of the value chains, including intermediaries or village-level traders and processors, wholesalers, retailers, or exporters, women are left out and generally concentrated at the lower levels of the value chains. This division of labour is mostly a reflection of social and cultural ethos of the Indian society that discourages women to travel by themselves or even own agricultural land. An important effect of this is that it curtails access of women to resources and services, including credit, training, extension, inputs, and trade and marketing networks.

Women do not have collateral to avail loan or opportunities to participate in extension training because selection of candidates is often based on ownership of land titles or other formal records. Moreover, there are fewer or no women service providers in extension, credit, input supply, trade or marketing. Despite the crucial role that women play in harvesting and post-harvest management activities, there is little or no training in quality control, hygiene, sanitation, and higher - value addition areas targeted at women.

### 1.3.1.8 Relevant social baseline primary data

The table below indicates the risks faced by different categories of farmers. Analysis for eight commodities (turmeric, gram, soybean, tur, chilli, ladyfinger (okra), and goat), is at **Appendix E**.

From the findings, the vulnerable group in terms of access to storage, lack of forward linkages, market intelligence, infrastructure is the SC and ST population as they have little / no access to such facilities. The other most vulnerable group are women headed households among the small and marginal farmers who lack access to credit facilities as well:

**Table 21: Risk matrix**

| Main challenges                                                               | Risk categorisation (Marginal farmers) |    |     |        |     | Risk categorisation (Small farmers) |    |     |        |     |
|-------------------------------------------------------------------------------|----------------------------------------|----|-----|--------|-----|-------------------------------------|----|-----|--------|-----|
|                                                                               | SC                                     | ST | OBC | Others | WHH | SC                                  | ST | OBC | Others | WHH |
| Poor Farm Productivity and Traditional Farming Techniques                     | H                                      | S  | M   | M      | S   | H                                   | H  | M   | M      | S   |
| Lack of storage facility                                                      | S                                      | S  | H   | H      | S   | H                                   | H  | M   | M      | S   |
| Lack of forward linkages (lack of knowledge and access to formalised markets) | S                                      | S  | H   | H      | S   | S                                   | S  | M   | M      | S   |
| Lack of market intelligence services for agri. Commodities                    | S                                      | S  | H   | H      | S   | S                                   | S  | H   | H      | S   |
| Lack of infrastructure (primary processing units)                             | S                                      | S  | H   | H      | S   | S                                   | S  | H   | H      | S   |
| Inadequate bank finance due to small landholdings                             | H                                      | H  | M   | M      | S   | H                                   | H  | M   | M      | S   |
| Shortage of labour for farm operations                                        | L                                      | L  | M   | M      | L   | L                                   | L  | H   | H      | L   |

Source: Productive Partnership Data compiled during the Field Survey  
 S=Substantial, H= High, M= Moderate, L=Low

The table below indicates vulnerability of farmers based on their social categories and land holdings. A small and marginal farmer from the SC/ST category is at Substantial risk, whereas, small and marginal farmer from the general and OBC category is at high risk.

**Figure 6: Vulnerability Assessment**

|               |                        |                 |             |
|---------------|------------------------|-----------------|-------------|
|               | Marginal / Small / WHH | HIGH            | SUBSTANTIAL |
| Land Category | Big Farmer             | LOW             | MODERATE    |
|               |                        | General / OBC   | SC/ST       |
|               |                        | Social Category |             |

Source: Productive Partnership Data compiled during the Field Survey

## 4.2 Environment Baseline

This section presents the existing environmental status of the project area based on review of primary data, stakeholder consultation and secondary information / data specific to the project collected from the respective departments, literature / journals review and websites.

### 4.2.1 Topography

Maharashtra is in the north centre of Peninsular India and is spread over a geographic area of 3,07,713 sq.km. The state is located between 15° 45' N to 22° 06' N latitude and 72° 36'E to 80° 54' E longitude<sup>1</sup>. Maharashtra topography comprises of Western Ghats or Sahyadri hill and Deccan Plateau. Detailed review of topography is presented in **Appendix F**.

### 4.2.2 Geology and Soil

Maharashtra's geology comprises of Deccan trap, alluvial deposit, Proterozoic rock, Gondwana system and Lameta and Bagh Beds. Detailed review of geology is presented in **Appendix F**.

#### 1.3.1.9 Soil

The nutrition management of soil is done through testing of soil and issuing soil health cards to the farmers. The soil health card testing infrastructure available in State is given in the table below:

**Table 22: Soil Health Card Testing Infrastructure in Maharashtra**

| Item                                                    | Quantity                          |
|---------------------------------------------------------|-----------------------------------|
| No of government laboratories                           | 31                                |
| Registered laboratories with agriculture department     | 234                               |
| Total laboratories                                      | 255                               |
| Capacity of testing of soil samples by 255 laboratories | 22.50 lakhs soil samples per year |

Source: Department of Agriculture, Government of Maharashtra, 2019

The status of the soil health cards issued in the State is given below:

**Table 23: Status of Soil Health Cards issued till July 2019**

| Item                                                          | Quantity                                                                                                                               |
|---------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Soil Health card issued in 2015-16 and 2016-17 (First cycle)  | <ul style="list-style-type: none"> <li>● No of cards issued 131.45 lakhs</li> <li>● No of soil samples tested – 27.22 lakhs</li> </ul> |
| Soil Health card issued in 2017-18 and 2018-19 (Second cycle) | <ul style="list-style-type: none"> <li>● No of cards issued 130.35 lakhs</li> <li>● No of soil samples tested 27.94 lakhs</li> </ul>   |
| Target of issue of soil health card in year 2019-20           | 2.08 lakhs samples                                                                                                                     |
| Soil samples already taken till July 2019                     | 1.82 lakhs samples (88 percent)                                                                                                        |
| Soil samples already tested till July 2019                    | 1.10 lakhs (32 percent)                                                                                                                |
| No of soil health card already issued by July 2019            | 00.66 lakhs                                                                                                                            |

Source: Department of Agriculture, Government of Maharashtra, 2019

Soil type in Maharashtra is predominantly black cotton soil. The chemical characteristics of major soil type in Maharashtra are as indicated in the table below.

<sup>1</sup> Dr Shelar S K and Dr Madhuri S K; Conservation Strategies of Biodiversity in Maharashtra, India, International Journal of Applied Research 2016; 2(4); 713 -716

**Table 24: Maharashtra Soil Chemical Characteristics**

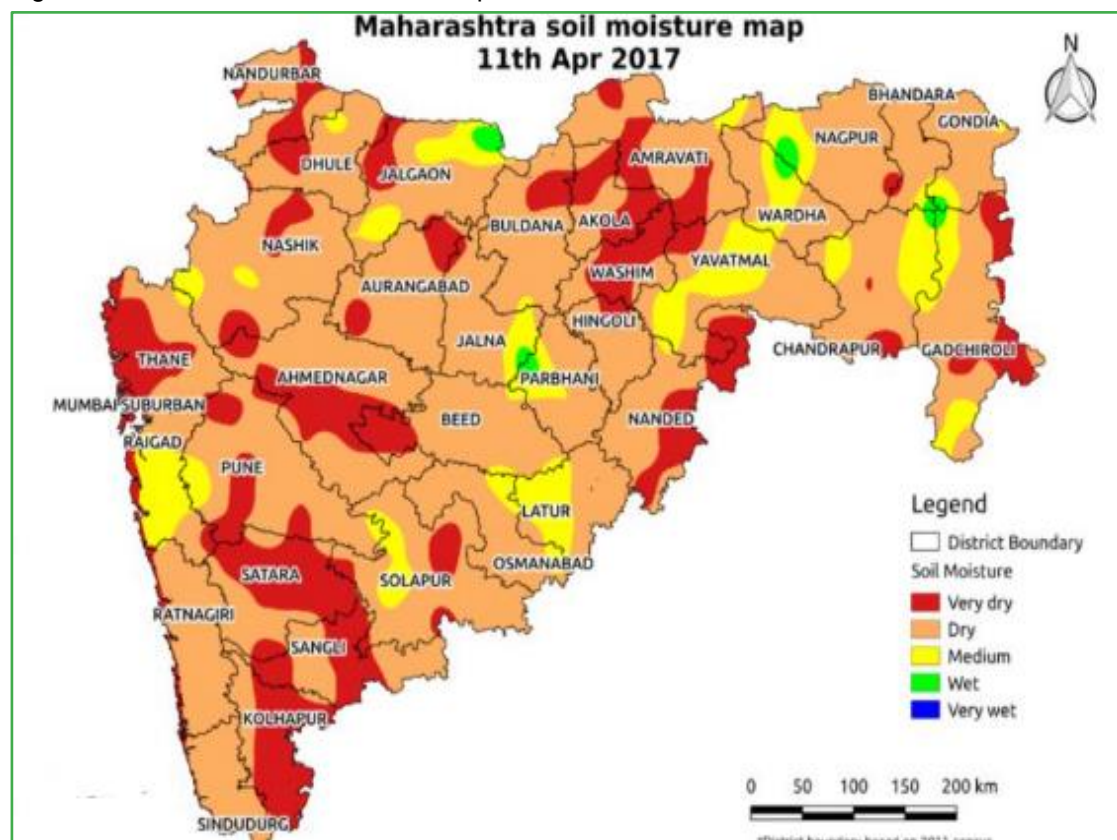
| Parameters                                            | Laterite Soil | Medium Black Soil | Coastal Saline Soil |
|-------------------------------------------------------|---------------|-------------------|---------------------|
| pH                                                    | 5.8 – 6.4     | 6.9 – 7.2         | 7.3 – 8.4           |
| EC dS m <sup>-1</sup>                                 | 0.06 – 0.08   | 0.11 – 0.14       | 3.0 – 4.2           |
| Organic Carbon percent                                | 0.51 – 1.8    | 0.46 – 1.29       | 0.2 – 0.78          |
| Organic Matter percent                                | 0.87 – 3.10   | 0.79 – 2.22       | 0.34 – 1.34         |
| CEC C mole (P+) kg <sup>-1</sup>                      | 28.4 – 31.69  | 34.4 – 40.86      | 41.4 – 49.4         |
| Av. Nitrogen kg ha <sup>-1</sup>                      | 273.5 - 311.4 | 247.8 - 259.4     | 302.3 - 312.4       |
| Av. P <sub>2</sub> O <sub>5</sub> kg ha <sup>-1</sup> | 9.0 – 9.8     | 15.6 – 18.4       | 16.5 – 23.4         |
| Av. K <sub>2</sub> O kg ha <sup>-1</sup>              | 229.8 - 249.3 | 260.4 - 282.5     | 972.0 - 982.6       |
| Zn mg kg <sup>-1</sup>                                | 2.90 - 3.60   | 2.40 - 3.51       | 3.10 - 3.25         |
| Cu mg kg <sup>-1</sup>                                | 3.20 - 4.46   | 2.91 - 3.56       | 3.80 - 5.87         |
| Mn mg kg <sup>-1</sup>                                | 32.6 - 47.9   | 25.1 - 31.6       | 22.6 - 29.1         |
| Fe mg kg <sup>-1</sup>                                | 48.3 - 49.4   | 21.4 - 25.8       | 23.8 - 29.2         |

Source: Distribution of nutrients in Different soil types in Maharashtra, International Journal of Chemical studies, IJCS 2018 pp 275 - 279

### 1.3.1.10 Soil Moisture

The soil moisture map of Maharashtra as on June 2017 is indicated in the Figure below. The map indicates that during summer almost 75 percent of the state has very dry to dry soil moisture.

Figure 7: Maharashtra Soil Moisture Map



Source: AAPAH Innovations

Soil moisture in the month of August 2017 is indicated in **Appendix F**.

#### 4.2.3 Area under INDGAP

GAP is a certification of good agricultural practices by Quality Council of India (QCI). The commodity wise area under GAP in Maharashtra is given below.

**Table 25: Area under GAP in Maharashtra (in Ha)**

| S. No. | Commodity   | Area in Ha |
|--------|-------------|------------|
| 1      | Grape       | 40,000     |
| 2      | Mango       | 8,000      |
| 3      | Pomegranate | 2,500      |
| 4      | Vegetables  | 18,000     |

Source: APEDA – grapenet, mangonet, pomonet, vegetablenet, 2019

#### 4.2.4 Climate and Rainfall

Maharashtra has typical monsoon climate, with hot, rainy and cold weather seasons. Dew, frost, hail could also occur sometimes due to the seasonal weather. Summers are in the months of March, April and May and temperature ranges between 22 °C to 39 °C. Winter prevails from November to February and the temperature varies from 12 °C to 34 °C. Winters are cool and dry with clear sky, gentle breeze and pleasant weather.

Rainfall in Maharashtra differs from one region to another. Thane, Raigad, Ratnagiri and Sindhudurg districts receive heavy rains at an average of 2000 mm annually. But the districts of Nasik, Pune, Ahmednagar, Dhule, Jalgaon, Satara, Sangli, Solapur and parts of Kolhapur get less than 50 mm of rainfall. Rainfall particularly concentrates on the Konkan and Sahyadrian Maharashtra regions. Central Maharashtra receives less rainfall. However, under the influence of the Bay of Bengal, eastern Vidarbha receives good rainfall in July, August and September months.

Large variation in the quantity of rainfall can be observed within different parts of the state. The total rainfall in the state during the year 2018 was 73.6 percent of the normal. Out of the 355 talukas excluding Mumbai city and Mumbai suburbs districts in the state, nine talukas received scanty rainfall, 183 talukas (51.5 percent) received deficient rainfall, 138 talukas received normal rainfall and 25 talukas received excess rainfall<sup>2</sup>. Region wise actual rainfall received are as indicated in the table below:

**Table 26: Region wise Rainfall Received (in mm)**

| Rainfall During |        | Konkan | Nashik | Pune  | Aurangabad | Amravati | Nagpur | Maharashtra   |
|-----------------|--------|--------|--------|-------|------------|----------|--------|---------------|
| June            | Normal | 660.2  | 127.7  | 166.0 | 145.8      | 154.1    | 187.5  | 223.3         |
|                 | 2017   | 788.3  | 138.4  | 167.9 | 171.5      | 138.1    | 118.5  | 219.1 (98.1)  |
|                 | 2018   | 903.4  | 119.4  | 146.2 | 170.8      | 169.3    | 189.8  | 237.9 (106.5) |
| July            | Normal | 1164.7 | 235.5  | 330.6 | 201.2      | 261.0    | 412.3  | 402.6         |
|                 | 2017   | 1096.1 | 219.6  | 266.7 | 73.8       | 147.1    | 274.4  | 288.9 (71.8)  |
|                 | 2018   | 1264.2 | 156.7  | 311.8 | 109.1      | 227.5    | 387.8  | 342.6 (85.1)  |
| August          | Normal | 757.1  | 189.0  | 216.7 | 197.3      | 210.0    | 352.4  | 303.3         |
|                 | 2017   | 769.8  | 163.8  | 136.7 | 212.1      | 124.7    | 227.2  | 235.2 (77.5)  |

<sup>2</sup> Economic Survey of Maharashtra Report 2018-19

| Rainfall During |        | Konkan | Nashik | Pune  | Aurangabad | Amravati | Nagpur  | Maharashtra    |
|-----------------|--------|--------|--------|-------|------------|----------|---------|----------------|
| September       | 2018   | 567.2  | 145.5  | 187.0 | 184.9      | 186.1    | 268.3   | 231.4 (76.3)   |
|                 | Normal | 379.0  | 158.6  | 158.2 | 176.9      | 166.7    | 209.5   | 202.1          |
|                 | 2017   | 511.6  | 123.2  | 205.4 | 131.4      | 102.3    | 125.7   | 180.4 (89.3)   |
| October         | 2018   | 117.5  | 32.6   | 54.8  | 23.7       | 49.9     | 102.2   | 57.0 (28.2)    |
|                 | Normal | 115.4  | 50.8   | 91.6  | 58.6       | 46.1     | 53.5    | 67.4           |
|                 | 2017   | 151.8  | 88.8   | 114.9 | 80.8       | 50.1     | 45.6    | 86.5 (128.3)   |
| June to October | 2018   | 45.1   | 3.5    | 30.5  | 6.0        | 0.0      | 0.0     | 12.8 (19.0)    |
|                 | Normal | 3076.4 | 761.6  | 963.1 | 779.8      | 837.9    | 1,215.2 | 1,198.7        |
|                 | 2017   | 3317.6 | 733.8  | 891.6 | 669.6      | 562.3    | 791.4   | 1,010.1 (84.3) |
|                 | 2018   | 2897.4 | 457.7  | 730.3 | 494.5      | 632.8    | 948.1   | 881.7 (73.6)   |

Source: Economic Survey of Maharashtra 2018-19

#### 4.2.5 Agroclimatic Zone Feature

Maharashtra can be divided in to nine agro-climatic zones based on rainfall, soil type and vegetation. These are namely:

1. North Konkan Costal Zone
2. South Konkan Costal Zone
3. Western Ghat Zone
4. Sub-mountain Zone
5. Western Maharashtra Plain Zone
6. Scarcity Zone / Western Drought Prone Area
7. Central Maharashtra Plateau Zone / Central Plateau Assured Rainfall
8. Central Vidarbha Zone / Central Vidarbha Moderate Rainfall
9. Eastern Vidarbha Zone / Eastern Vidarbha high Rainfall.

Characteristics of these agroclimatic zones are indicated in the table below:

**Table 27: Characteristics of Agro – Climatic Zones**

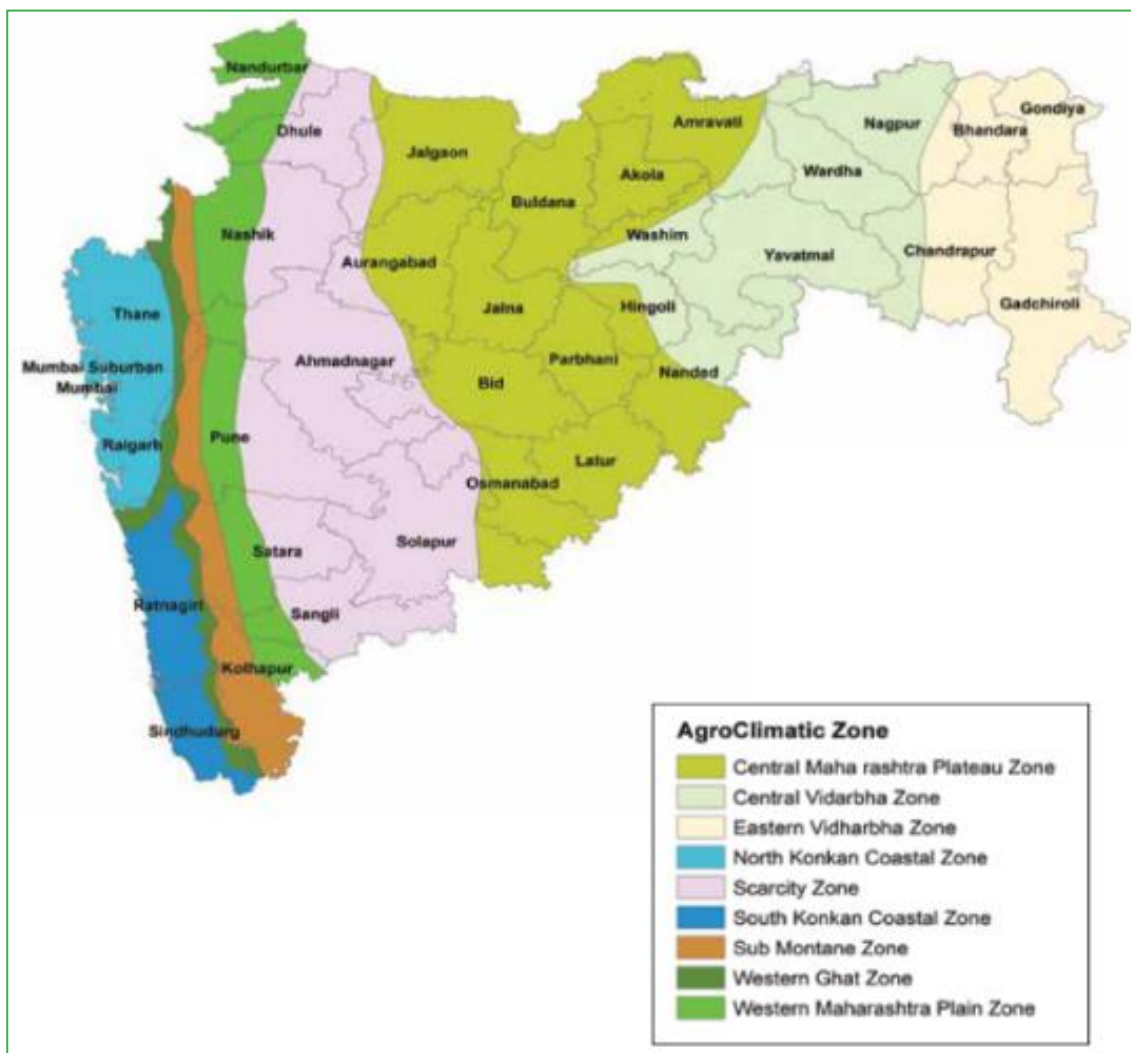
| S. No. | Zone                     | District                                               | Characteristics                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------|--------------------------|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1      | North Konkan Costal Zone | Thane and Raigad                                       | Very high rainfall, more than 3,000 mm/year. High humidity in rainy season. Temperature range between 22 – 33°C. Coarse alluvial non-lateritic soil poor in Phosphorous and Potassium. Rice is the major crop and some vegetable and pulses. It has small forest cover.                                                                                                                                                                     |
| 2      | South Konkan Costal Zone | Ratnagiri and Sindhudurg                               | Very high rainfall, more than 3,000 mm/year. Precipitation dictated by S-W monsoon from June to September. Temperature ranges from 20 -30 degree Celsius. May is the hottest month. Coastal alluvial lateritic soil rich in Nitrogen and Potassium and poor in Phosphorous. Rice is the major crop along with fruits especially mango.                                                                                                      |
| 3      | Western Ghat Zone        | Kolhapur, Satara, Pune, Ahmednagar, Nashik, Sindhudurg | Very narrow strip of highlands extending from North to South along the crest of Sahyadri mountain range. Altitude varies from 1000 to 2000 AMSL. Very heavy rainfall in some areas in excess of 4000 mm/year. Daily temperature ranges from 30 to 40 degree Celsius. Lateritic reddish-brown soil low in Phosphorous and Potassium. About 25 percent of area is under forest. Rice, sorghum, groundnut and fruit trees are important crops. |
| 4      | Sub-mountain Zone        | Nashik, Pune, Satara, Sangli, Kolhapur                 | Narrow strip of lower elevation located in the eastern side of the Sahayadari range. Rainfall ranges from 700 to 2500 mm/year dictated by the S-W monsoon. Day temperature varies from 28 to 35 degree Celsius. Soil are reddish-brown to black, rich in                                                                                                                                                                                    |

| S. No. | Zone                                                                | District                                                                                                   | Characteristics                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------|---------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        |                                                                     |                                                                                                            | Nitrogen and poor in Phosphorous. Important crops are Kharif cereals, groundnut, sugarcane, vegetable, chillies and fruit trees.                                                                                                                                                                                                                                                                                             |
| 5      | Western Maharashtra Plain Zone                                      | Dhule, Ahmednagar, Sangli, Nashik, Pune, Satara, Solapur and Kolhapur                                      | Mostly plain strip. Rainfall varies from 700 to 1200 mm/year well distributed during the S-W monsoon. Maximum temperature reaches 40°C during summer. Soil is generally light black with fare level of NPK, well drained and suited for irrigation. Major crops are sorghum, millet, groundnut, wheat and sugarcane.                                                                                                         |
| 6      | Scarcity Zone / Western Drought Prone Area                          | Dhule, Nashik, Aurangabad, Ahmednagar, Pune, Satara, Solapur and Sangli.                                   | Characterised by low and unpredictable rainfall of 500 to 700 mm/year in 40 – 45 days. Common dry spell will last for 2 to 10 weeks. Delayed onset and early cessation of S-W monsoon are very common. Summer temperature reaches above 42 °C. Soil types are medium black vertisoils, coarse, shallow, poor in Nitrogen and Phosphorous. Common crops are millet sorghum, groundnut and pulses and the yields are very low. |
| 7      | Central Maharashtra Plateau Zone / Central Plateau Assured Rainfall | Aurangabad, Jalna, Beed Osmanabad, Parbhani, Nanded, Buldhana, Akola, Amravati, Jalgaon, Dhule and Solapur | Large plateau covering the central part of the state. Well distributed rainfall ranging from 700 to 900 mm/year dictated by S-W monsoon. Summer temperature will reach about 40 °C. Soil are Vertisoils and entisoils varying from medium black to reddish brown. Sorghum is the most important crop, but cotton, oilseed, millet, groundnut, pulses and sugarcane occupy significant area.                                  |
| 8      | Central Vidarbha Zone / Central Vidarbha Moderate Rainfall          | Wardha, Nagpur, Yavatmal, Chandrapur, Aurangabad, Jalna, Parbhani, Nanded                                  | Rainfall of 1200 mm/year well distributed within the S-W monsoon months. Maximum temperature of 35 – 40-degree Celsius in summer. Humidity of about 75 percent in rainy season. Soil are black derived from basalt rock, medium to heavy texture and generally fertile. Cropping pattern involve cotton, sorghum, pulses, wheat and oilseed.                                                                                 |
| 9      | Eastern Vidarbha Zone / Eastern Vidarbha high Rainfall              | Bhandara, Gadchiroli, Chandrapur, Nagpur and Gondiya                                                       | Soil derived from parent material of mixed origin are reddish brown. Almost 50 percent of the area under forest cover. Rainfall vary from 1300 to 1800 mm / year and well distributed in the monsoon months. Humidity is about 75 percent in the rainy season. Rice, pulses, sorghum and oilseed are important crops.                                                                                                        |

Source: Report on Maharashtra Water Sector Improvement Project, Proposal for Agricultural Support Services, Department of Agriculture, Maharashtra State

The Agro-climatic zone map of Maharashtra is shown below:

**Figure 8: Agro-Climatic Zone Map of Maharashtra**



Source: Department of Agriculture, Government of Maharashtra

#### 4.2.6 Land Utilization and Cropping Intensity

The land use statistics as per the Economic statistics of Maharashtra 2018-19 is as indicated in the table below:

**Table 28: Maharashtra Land Use Pattern**

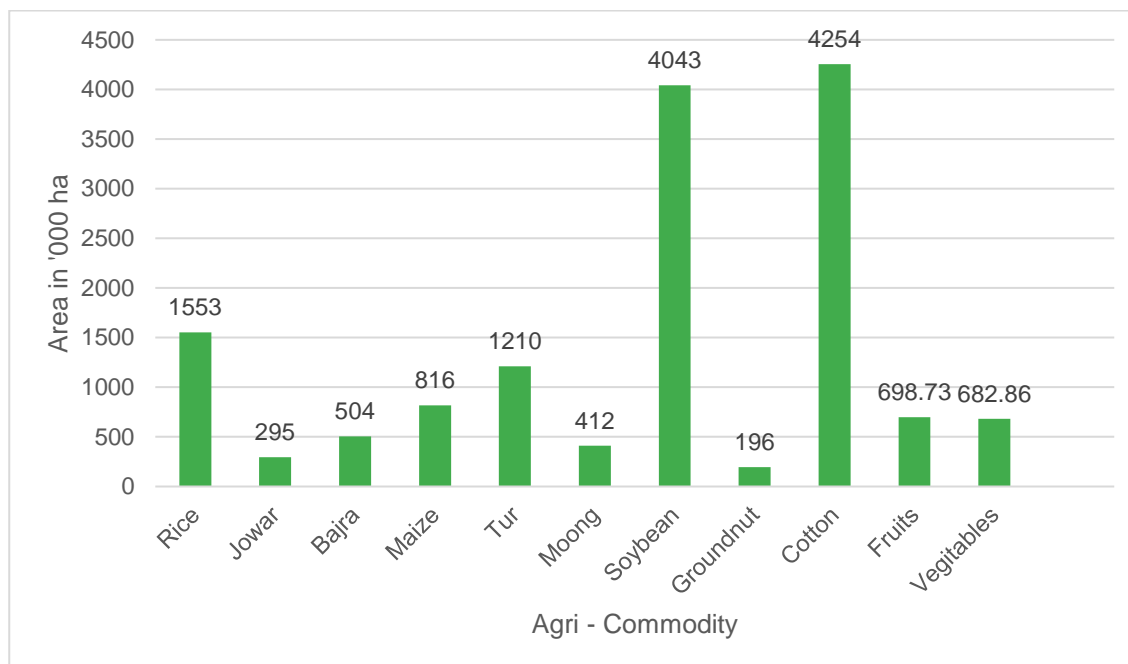
| Land Use                           | Area in lakh Ha | Percentage   |
|------------------------------------|-----------------|--------------|
| Total geographical area            | 307.58          |              |
| Gross cropped area                 | 232.24          |              |
| Net area sown                      | 169.10          | 55.0 percent |
| Forest                             |                 | 17.0 percent |
| Land not available for cultivation |                 | 11.0 percent |
| Other uncultivated land            |                 | 8.0 percent  |
| Fallow Land in Maharashtra         |                 | 9.0 percent  |

| Land Use                          | Area in lakh Ha | Percentage    |
|-----------------------------------|-----------------|---------------|
| Cropping intensity of Maharashtra |                 | 137.3 percent |

Source: Economic Survey of Maharashtra 2017-18

As per the land utilization statistics for the year 2016-17 out of the total 307.58 lakh Ha geographical area, the gross cropped area was 232.24 lakh Ha while the net sown area was 169.10 lakh Ha Area under principal crops in the year 2018-19 (tentative) as per economic survey of Maharashtra report 2018-19 are as indicated in the Figure below:

**Figure 9: Area under principal crops**



Source: Economic Survey of Maharashtra 2017-18

#### 4.2.7 Cropping Pattern

Kharif season sowing in the year 2018 was complete in 151.03 lakh Ha which was 0.05 percent more than the previous year. The area under cereals, pulses and cotton decreased while area of oilseeds and sugarcane crop increased as compared to the last year. The production of cereals and pulses is expected to decrease by 6 percent to 35 percent respectively while the production of oilseeds, cotton and sugarcane crop is expected to increase by 16 percent, 17 percent and 10 percent respectively as compared to the last year.

Area under Rabi crops is 50 percent less compared to the previous year mainly due to deficient rainfall in September and October 2018. The area of cereals, pulses and oilseeds decreased by 56 percent, 40 percent and 58 percent respectively as compared to the previous year.

During 2018-19, the area of summer crops is 0.84 lakh Ha which is 41 percent less than the previous year (1.33 lakh Ha). Area under cereals, pulses and oilseeds decreased by 19 percent, 34 percent and 62 percent respectively.

The district-wise cropping intensity is indicated in **Appendix F**.

#### 4.2.8 Water Resource

The average water availability in Maharashtra is 163.82 km<sup>3</sup>. According to inter-state water tribunal awards, the allocated quantity of water to the state is 125.94 km<sup>3</sup>. Almost 55 percent of the dependable yield is available from the four river basins namely Krishna, Godavari, Tapi and Narmada east of Western Ghats - these four river basins comprise 92 percent of the cultivatable land and more than 60 percent of the rural population. Balance 45 percent of the state's water resource are contributed by West Flowing Rivers which are mainly monsoon specific rivers emanating from the Ghats and draining into the Arabian sea and are not utilized due to geographical constraints.

All surface water management related activities are managed by Maharashtra Water Resource Department. Until June 2016 the department has been successful in creating an irrigation potential of 49.57 lakh Ha and a storage capacity of 33,385 Million cubic meter<sup>3</sup>. It has also constructed 77 hydropower projects with an installed capacity of 3,682 MW.

Ground Water Year Book of Maharashtra and Dadra and Nagar Haveli report 2016-17 by the Central Ground Water Board presents the ground water level in different parts of the state. The study shows that water level less than two meter below ground level (mbgl) been observed in 7 percent of wells covering about 23,302 sq. km. area (23.30 lakh Ha). Water level in this range is observed in major parts of Raigad, Pune, Nashik, Thane, Kolhapur, Sindhudurg, Amravati, Nagpur, Bhandara and Gondia districts and as isolated patches in parts of most of the districts.

About 36 percent of wells shows water level between 2 to 5 m bgl covering about 1,09,633 sq. km. area (109.63 lakh Ha). Water level in this range is observed in most parts of Satara, Sangli, Kolhapur, Pune, Raigad, Thane, Nashik, Nandurbar, Yavatmal, Chandrapur, Gadchiroli, Gondia, Bhandara, Nagpur and Wardha districts and as isolated patches in parts of all districts.

About 42 percent of wells show water level between 5 and 10 m bgl covering about 1,32,612 sq. km. area (132.6 lakh Ha). Water level in this range are observed in major parts of Solapur, Osmanabad, Latur, Parbharni, Beed, Ahmednagar, Aurangabad, Jalna, Jalgaon, Nashik, Dhule, Buldhana, Washim, Akola, Nanded, Yavatmal, Wardha and Nagpur districts. Small isolated patches showing this range of water level been observed in almost all the districts.

Deeper ground water level, ranging from 10 to 20 m bgl, is observed as isolated patches, mostly in northern parts of Maharashtra in the Tapi and Purna River basins in Jalgaon, Buldhana, Akola, Amravati, Nashik, Nandurbar, Dhule, and major parts of Ahmednagar, Aurangabad, Jalna, Latur, Nanded, Parbharni, Hingoli, Beed, Ratnagiri, Sindhudurg and districts. About 14 percent of the wells fall in this category covering about 39,251 sq. km. area (39.25 lakh Ha).

Groundwater level pertaining to more than 20 m bgl, covering about 2,215 sq. km. area (2.22 lakh Ha) was observed in parts of Jalgaon, Akola, Buldhana Amravati and Nashik, Osmanabad and Latur districts.

##### 1.3.1.11 Ground Water Quality

Minimum, maximum and the average values of the chemical parameters analysed in the 1078 ground water samples collected from wells representing shallow aquifer are summarized in the following table:

---

<sup>3</sup> Water Resource Department, Government of Maharashtra, India accessed on 21.04.2019.

**Table 29: Ground Water Quality Maharashtra**

| S. No. | Parameters                           | Minimum | Maximum | Average |
|--------|--------------------------------------|---------|---------|---------|
| 1      | pH                                   | 6.6     | 8.8     | 7.80    |
| 2      | EC $\mu$ S/cm @ 25°C                 | 40.0    | 9301    | 953     |
| 3      | TDS (mg/L)                           | 21      | 4933    | 495     |
| 4      | TH (mg/L)                            | 20      | 3600    | 360     |
| 5      | Ca <sup>++</sup> (mg/L)              | 2       | 701     | 76      |
| 6      | Mg <sup>++</sup> (mg/L)              | 1.2     | 482     | 41      |
| 7      | Na <sup>+</sup> (mg/L)               | 1       | 222     | 58      |
| 8      | K <sup>+</sup> (mg/L)                | 0       | 86      | 6.65    |
| 9      | CO <sub>3</sub> <sup>--</sup> (mg/L) | 0       | 36      | 1.37    |
| 10     | HCO <sub>3</sub> <sup>-</sup> (mg/L) | 12      | 744     | 242     |
| 11     | Cl <sup>-</sup> (mg/L)               | 7       | 1872    | 138     |
| 12     | NO <sub>3</sub> <sup>-</sup> (mg/L)  | 1       | 64      | 27      |
| 13     | SO <sub>4</sub> <sup>--</sup> (mg/L) | 0       | 1482    | 101     |
| 14     | F <sup>-</sup> (mg/L)                | 0       | 1.9     | 0.31    |

Source: Central Ground Water Board

The quality of irrigation water depends primarily on the presence of dissolved salts and their concentrations. The Electrical Conductivity (EC), Sodium Absorption Ratio (SAR) and Residual Sodium Carbonate (RSC) are the most important quality criteria, which influence the water quality and its suitability for irrigation. The amounts of dissolved ions in water is best represented by the parameter electrical conductivity. Maximum number of samples fall under the category of medium and high salinity water while nearly 9.37 percent of samples fall under low salinity water and 4.55 percent of samples in very high salinity water. This shows that the ground water in the pre-monsoon season from shallow aquifers in the State should be used for irrigation with proper soil and crop management practices. Further the Sodium Adsorption Ratio (SAR) and Residual Sodium Carbonates were also calculated, and the results indicates that ground water quality of Maharashtra is suitable for irrigation purpose.

#### 4.2.9 Irrigation Practices

As per economic survey of Maharashtra 2018-19, the irrigated area in the command area under the jurisdiction of Water Resource Department, is 39.50 lakhs Ha in 2017-18.

Area under irrigation in the state is 17.8 percent of the total gross area under cultivation. Out of which 55 percent is irrigated by wells and 45 percent by surface irrigation. The year – wise data on micro-irrigation scheme is in table below:

**Table 30: Micro Irrigation Schemes from 2009-10 to 2018-19**

| S. No. | Year    | Expenditure (Rs. Lakh) | (Area Lakh Ha) | Beneficiary No. |
|--------|---------|------------------------|----------------|-----------------|
| 1      | 2009-10 | 132.26                 | 1.19           | 131,133         |
| 2      | 2010-11 | 505.06                 | 2.15           | 227,556         |
| 3      | 2011-12 | 705.34                 | 2.86           | 295,018         |
| 4      | 2012-13 | 516.48                 | 1.42           | 165,866         |
| 5      | 2013-14 | 188.31                 | 0.74           | 80,740          |
| 6      | 2014-15 | 688.41                 | 2.14           | 252,676         |
| 7      | 2015-16 | 445.98                 | 1.36           | 146,142         |
| 8      | 2016-17 | 584.00                 | 1.91           | 209,987         |

| S. No. | Year         | Expenditure (Rs. Lakh) | (Area Lakh Ha) | Beneficiary No.  |
|--------|--------------|------------------------|----------------|------------------|
| 9      | 2017-18      | 687.70                 | 2.09           | 264,180          |
| 10     | 2018-19      | 357.60                 | 1.12           | 154,542          |
|        | <b>Total</b> | <b>4811.14</b>         | <b>16.98</b>   | <b>1,927,840</b> |

Source : Economic Survey of Maharashtra 2018-19

Districtwide area covered under Micro Irrigation from 1986-87 to 2018-19 (Area in Hectare) is in table below:

**Table 31: District Wise Area Covered under Micro Irrigation from 1986-87 to 2018-19**

| S. No. | District               | 1986-87 to 2018-19 |                |                |
|--------|------------------------|--------------------|----------------|----------------|
|        |                        | Drip               | Sprinkler      | Total          |
| 1      | Thane                  | 5,567              | 129            | 5,697          |
| 2      | Palghar                | 325                | 16             | 342            |
| 3      | Raigad                 | 1,681              | 47             | 1,727          |
| 4      | Ratnagiri              | 3,984              | 84             | 4,067          |
| 5      | Sindhudurg             | 2,418              | 44             | 2,462          |
|        | <b>Konkan Division</b> | <b>13,975</b>      | <b>319</b>     | <b>14,294</b>  |
| 6      | Nashik                 | 139,418            | 14,873         | 154,291        |
| 7      | Dhule                  | 70,608             | 3,340          | 73,948         |
| 8      | Nandurbar              | 27,436             | 1,451          | 28,887         |
| 9      | Jalgaon                | 295,735            | 11,405         | 307,140        |
| 10     | A.nagar                | 116,267            | 33,190         | 149,457        |
|        | <b>Nashik Division</b> | <b>649,464</b>     | <b>64,258</b>  | <b>713,723</b> |
| 11     | Pune                   | 85,045             | 7,019          | 92,064         |
| 13     | Solapur                | 172,768            | 8,565          | 181,333        |
| 12     | Sangli                 | 78,810             | 19,617         | 98,427         |
| 14     | Satara                 | 35,859             | 14,522         | 50,381         |
| 15     | Kolhapur               | 17,548             | 2,104          | 19,652         |
|        | <b>Pune Division</b>   | <b>390,030</b>     | <b>51,826</b>  | <b>441,856</b> |
| 16     | A.bad                  | 105,900            | 14,938         | 120,838        |
| 17     | Jalana                 | 84,088             | 25,206         | 109,294        |
| 18     | Beed                   | 48,154             | 17,483         | 65,637         |
| e      | Latur                  | 40,269             | 46,625         | 86,894         |
| 20     | O.bad                  | 44,317             | 18,268         | 62,585         |
| 21     | Nanded                 | 55,930             | 40,592         | 96,522         |
| 22     | Parbhani               | 49,675             | 15,775         | 65,450         |
| 23     | Hingoli                | 20,461             | 27,674         | 48,135         |
|        | <b>Aurangabad</b>      | <b>448,794</b>     | <b>206,561</b> | <b>655,354</b> |
| 24     | Buldhana               | 82,319             | 83,894         | 166,213        |
| 25     | Akola                  | 21,171             | 40,569         | 61,740         |
| 26     | Washim                 | 8,630              | 43,802         | 52,432         |
| 27     | Amrawati               | 61,842             | 61,443         | 123,285        |
| 28     | Yeotmal                | 21,611             | 68,264         | 89,875         |

| S. No.                    | District   | 1986-87 to 2018-19 |                |                  |
|---------------------------|------------|--------------------|----------------|------------------|
|                           |            | Drip               | Sprinkler      | Total            |
| <b>Amaravati Division</b> |            | <b>195,574</b>     | <b>297,971</b> | <b>493,545</b>   |
| 29                        | Wardha     | 12,212             | 39,344         | 51,556           |
| 30                        | Nagpur     | 14,400             | 15,763         | 30,163           |
| 32                        | Bhandara   | 1,441              | 1,905          | 3,346            |
| 31                        | Chandrapur | 2,941              | 10,614         | 13,555           |
| 33                        | Gondia     | 1,215              | 1,391          | 2,606            |
| e                         | Gadchiroli | 99                 | 698            | 797              |
| <b>Nagpur Division</b>    |            | <b>32,308</b>      | <b>69,715</b>  | <b>102,023</b>   |
| <b>State total</b>        |            | <b>1,730,144</b>   | <b>690651</b>  | <b>2,420,795</b> |

### 1.3.1.12 Electrification of Agricultural Pumps

The pumps installed in Maharashtra for irrigation purposes are given in the table below:

**Table 32: Number of agricultural pumps installed in Maharashtra**

| Number of Agricultural Pumps installed (in Lakhs) |         |         |         |
|---------------------------------------------------|---------|---------|---------|
| 2015-16                                           | 2016-17 | 2017-18 | 2018-19 |
| 38.82                                             | 39.67   | 40.82   | 42.02   |

Source: Economic Survey of India, 2016 to 2019

### 4.2.10 Practice of Organic / Low input Farming

Organic products are grown under a system of agriculture without the use of chemical fertilizers and pesticides following environmentally and socially responsible approach. Organic farming can be achieved by enriching soil by natural means like mulching, crop rotation and using organic fertilizers, management of soil temperature, conservation of soil and rainwater, integration of animal husbandry by products such as use of cow dung, renewable energy etc.

Agricultural and Processed Food Products Export Development Authority (APEDA) provides consolidated organic agricultural statistics, for the year 2017-18 under National Programme for Organic Production (NPOP). As per the statistics the area under Organic Certification process during the last five years (cultivated and wild harvest both) in the state of Maharashtra are as indicated in the following table:

**Table 33: Area under Organic Certification process - Maharashtra**

| Year       | 2013-14   | 2014-15    | 2015-16     | 2016-17     | 2017-18    |
|------------|-----------|------------|-------------|-------------|------------|
| Area in ha | 87,941.66 | 217,649.19 | 266,299.239 | 292,391.781 | 304,074.81 |

Source: APEDA

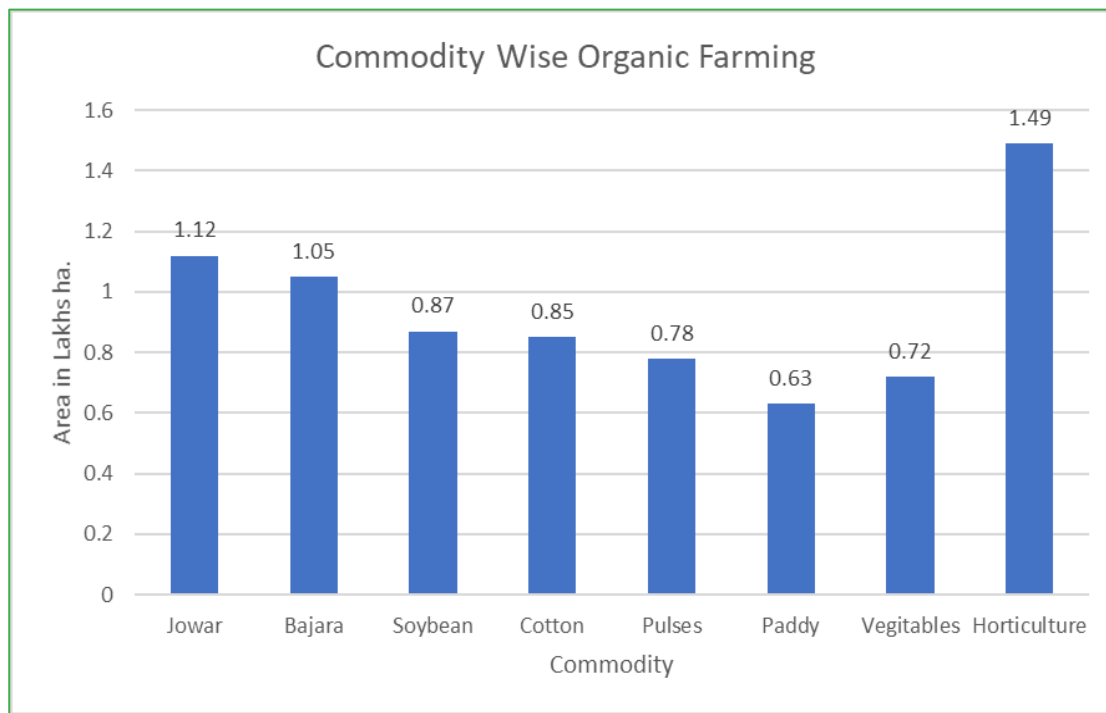
As per the statistics, out of 304,074.81 Ha area under certification in Maharashtra, 235,690.55 Ha is under cultivated area. Out of this cultivated area, 108,029.96 Ha is organic area and remaining 127,660.592 Ha is conversion area<sup>4</sup>.

National Programme on Organic Production (NPOP) defined the regulatory mechanism for organic produce in the country and is regulated under two different Acts for export and import market. USDA has also accepted the conformity assessment system of NPOP. Due to this, the

<sup>4</sup> [https://apeda.gov.in/apedawebsite/organic/data.htm#Summary\\_Statistics](https://apeda.gov.in/apedawebsite/organic/data.htm#Summary_Statistics), accessed on 7.03.2019

products certified by any Indian accredited certification agency under NPOP can be exported to Europe, Sweden and USA without the requirement of re-certification.

**Figure 10: Crop Wise Area under Organic Farming in Maharashtra**



Source: [http://niti.gov.in/writereaddata/files/Maharashtra\\_Report\\_0.pdf](http://niti.gov.in/writereaddata/files/Maharashtra_Report_0.pdf); accessed on 2.5.2019

Agencies like ECOCERT, NOKA, CONTROL UNION are engaged in certification of organic farming in the state<sup>5</sup>.

Ministry of Agriculture, Cooperation and Farmers Welfare, Department of Agriculture, Cooperation and Farmers Welfare is implementing Integrated Nutrient Management (INM) and Organic Farming component under National Mission for Sustainable Agriculture.

#### 4.2.11 Agricultural Pests in Maharashtra

The total number of pests attacking major crops has increased significantly from 1940s. For instance, the number of pests which are harmful for crops such as rice has increased from 10 numbers to 17 numbers whereas for wheat have increased from 2 numbers to 19 numbers. The increased damage to crops from pests and subsequent losses poses a serious threat to food security. Major Incidence of pest / disease in Maharashtra are as indicated in the table below:

**Table 34: Major Incidence of Pest / Disease - Maharashtra**

| Districts                  | Name of Crop | Pest / Disease | Intensity |
|----------------------------|--------------|----------------|-----------|
| Latur, Osmanabad, Solapur  | Pomegranate  | Oily Spot      | Moderate  |
| Jalgaon                    | Banana       | Sigatoka       | Moderate  |
| Wardha                     | Citrus       | Gimmosis       | Moderate  |
| Nagpur, Wardha, Chandrapur | Citrus       | Gimmosis       | Moderate  |

<sup>5</sup>

| Districts                                                                          | Name of Crop | Pest / Disease                                      | Intensity                     |
|------------------------------------------------------------------------------------|--------------|-----------------------------------------------------|-------------------------------|
| Nagpur, Katol, Saoner, Umred, Dhiwapur                                             | Soybean      | Tobacco Caterpillar                                 | Moderate – Sever              |
| Wardha, Nagpur                                                                     | Gram         | Helicoverpa                                         | Low - Moderate                |
| Washim, Katol Saoner, Umred, Dhiwapur, Wardha, Chandrapur, Neemtala, Balar         | Soybean      | Spodoptera, Hairy caterpillar, Green semi looper    | Above ETL, Moderate to Severe |
| Nagpur, Bhandara Chandrapur                                                        | Rice         | Army worm                                           | Moderate                      |
| Washim, Nagpur, Katol, Saone, Umred, Dhiwapur, Wardha, Chandrapur, Neemtala, Balar | Soybean      | Spodoptera, Hairy caterpillar and Green Semi Looper | Above ETL, Moderate to Severe |

Source: Directorate of Plant Protection Quarantine and Storage, Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture and Farmer Welfare, GoI, 2017

Details on crop wise pest details are indicated in **Appendix F**.

#### 4.2.12 Agrochemical Consumption

Insecticides, fungicides and herbicides are commonly used pesticides. India is the fourth largest global producer of agrochemicals after the US, Japan and China. This segment generated a value of USD 4.4 billion in FY15 and is expected to grow at 7.5 percent per annum to reach USD 6.3 billion by FY20. Approximately 50 percent of the demand comes from domestic consumers and the rest from exports. During the same period, domestic demand is expected to grow at 6.5 percent per annum and exports at 9 percent per annum<sup>6</sup>.

Per hectare consumption of pesticides was highest in Punjab (0.74 kg), followed by Haryana (0.62 kg) and Maharashtra (0.57 kg).

Bio-pesticide have the potential to control crop losses and reduce negative environmental externalities. Bio-pesticides constitutes around 3 percent of pesticide market in India. So far only 14 biopesticides have been registered under the Insecticides Act 1968 in India. Consumption of bio-pesticides has increased from 219 MT in 1996-97 to 683 MT in 2000-01 and further to around 5635 MT in 2015-16<sup>7</sup>.

Consumption of chemical and bio-pesticides in the state of Maharashtra are as indicated in the following table:

**Table 35: Use of Pesticides in Maharashtra (in MT)**

| Year    | Chemical Pesticides | Bio-pesticides |
|---------|---------------------|----------------|
| 2015-16 | 11,665              | 1,173          |
| 2016-17 | 13,496              | 1,454          |
| 2017-18 | 15,568              | 1,271          |
| 2018-19 | 15,705              | 2,252          |

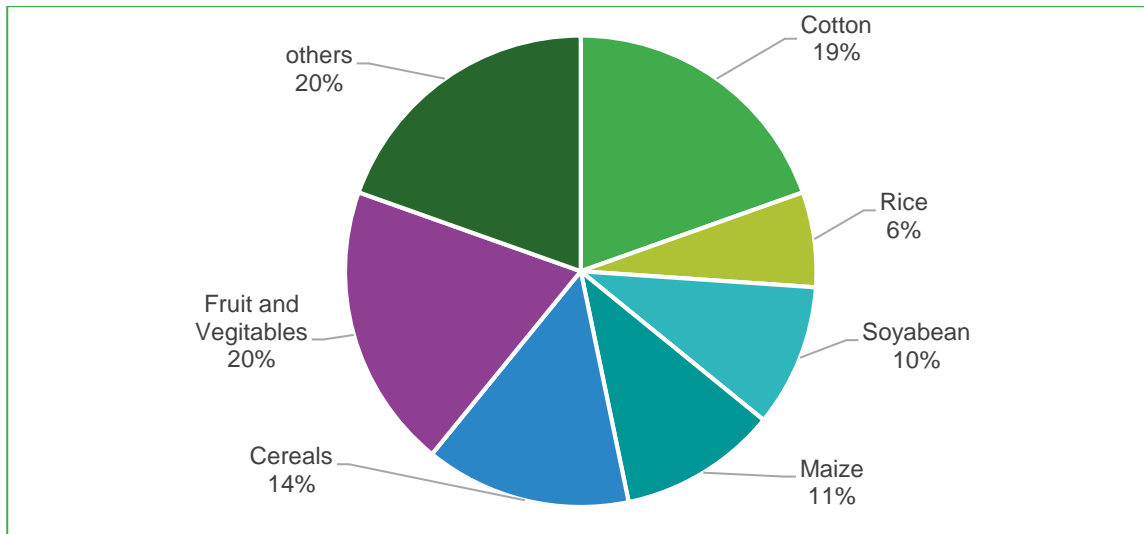
Source: Economic Survey of Maharashtra 2017-18

Regarding the global pesticide share across agricultural crops, vegetable accounts 20 percent and cotton account for 19 percent followed by soybean, maize and cereals. Figure below indicates crop wise pesticide share in India.

<sup>6</sup> Next Generation Indian Agriculture – Role of Crop Protection Solutions; A Report on Indian Agrochemical Industry July 2016

<sup>7</sup> Subhash SP, Prem Chand, Pavithra S, Balaji SJ and Suresh Pal, Pesticide Use in Indian Agriculture: Trend, Market Structure and Policy Issues. ICRA

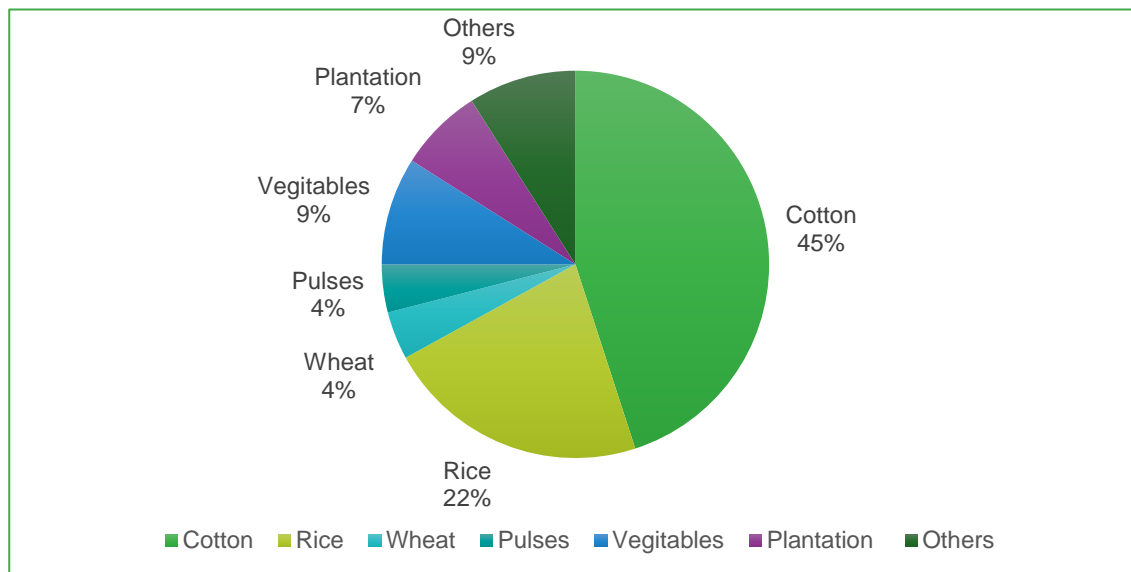
**Figure 11: Global Agri-commodity Category wise percent share of pesticide**



Source: Institute of Agri Business Management, Bikaner, 2015

The national share of pesticide uses 45 percent in cotton, 22 percent in rice followed by vegetable, pulses, and wheat.

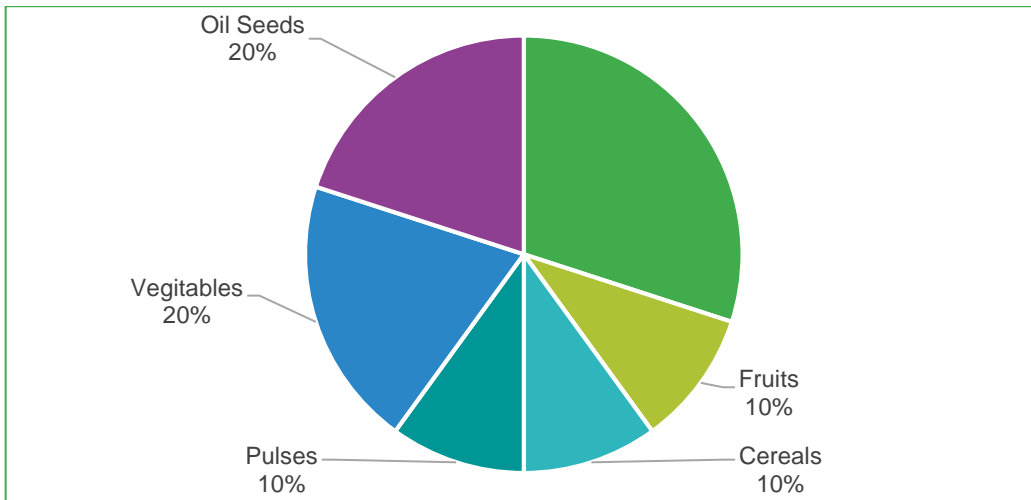
**Figure 12: National Agri-commodity Category wise percent share of pesticide**



Source: Institute of Agri Business Management, Bikaner, 2015

The pesticide shares in Maharashtra have 30 percent in cotton, 20 percent each in vegetable and oil seeds followed by fruits, pulses and cereals each 10 percent.

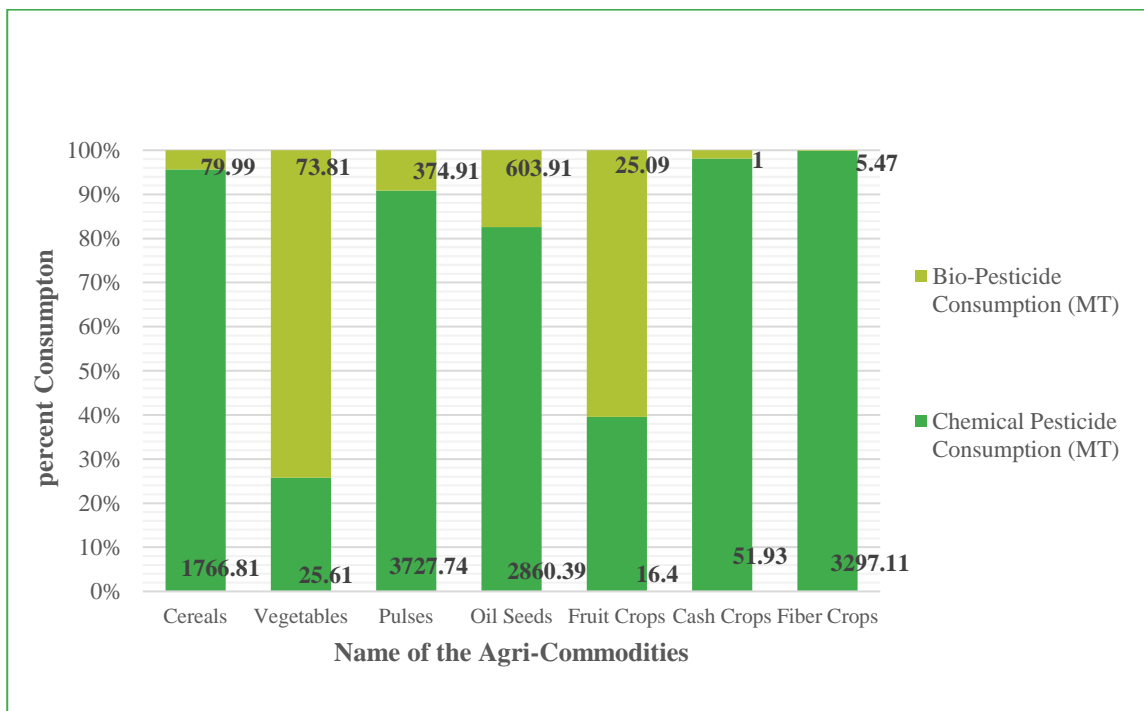
**Figure 13: Crop wise percent Pesticide Share in Maharashtra**



Source: Department of Agriculture, Maharashtra Year 2019

Agro-commodity wise consumption share of bio-pesticide and chemical pesticides used in Maharashtra is given in the following:

**Figure 14: Agri-commodity wise consumption of chemical and bio-pesticides in Maharashtra in MTs (2018-19)**



Detailed List of banned pesticides in India is presented in **Appendix F**.

### 1.3.1.13 Advisories Given to Farmers under Integrated Pest Management (IPM)

The details of advisories given to farmers under IPM in Maharashtra is provided in table below:

**Table 36: Advisories Given to Farmer under IPM in Maharashtra**

| S. No. | Year                                 | Area Covered (Lakh Ha) | Online Agro-advisories provided by Agricultural Universities | Agro-advisories provided through SMS |
|--------|--------------------------------------|------------------------|--------------------------------------------------------------|--------------------------------------|
| 1      | 2018-19                              | 127                    | 13,055                                                       | 602.15                               |
| 2      | 2019-20 (Progress till 19 July 2019) | 88.84                  | 29,846                                                       | 7.78                                 |

Source: Department of Agriculture, Government of Maharashtra, 2019

### 1.3.1.14 Training given to agricultural officers in IPM

The training given to the officers under IPM are given in table below:

**Table 37: Training given to Agricultural Officer under IPM in Maharashtra**

| S. No. | Year    | Officer trained by Agricultural Universities | Officer trained by National Institute of Plant Health Management, Hyderabad | Total Officers trained |
|--------|---------|----------------------------------------------|-----------------------------------------------------------------------------|------------------------|
| 1      | 2017-18 | 1854                                         | 75                                                                          | 1929                   |
| 2      | 2018-19 | 11882                                        | 89                                                                          | 11971                  |

Source: Department of Agriculture, Government of Maharashtra, 2019

## 4.2.13 Fertilizer Consumption Scenario

Fertilizers are natural and artificial substances containing the chemical element that improve growth and productiveness of plant. Fertilizer enhance the natural fertility of the soil or replace the chemical element taken from soil by previous crops.

The type of fertilizer used in India are Straight nitrogenous fertilizers such as Ammonium Sulphate, Calcium Ammonium Nitrate, Ammonium Chloride and Urea, Straight phosphatic fertilizers such as single super phosphate and triple super phosphate and NP / NPK complex Fertilizers such as urea, ammonium phosphate, ammonium phosphate Sulphate, Diammonium phosphate (DAP), Mono ammonium phosphate (MAP), Nitro phosphate, Nitro phosphate with potash, NP / NPKs

In Maharashtra more than 50 percent of soil is deficient in zinc and deficiency of iron and manganese is also apparent in many districts. Maharashtra ranks third with a share of 11 percent in all India consumption of fertilizers. Per hectare consumption of Maharashtra is 124.8 kg in 2018-19.

Chemical fertilizer consumption in Maharashtra is as indicated in the table below:

**Table 38: Chemical Fertilizer Consumption (in lakh MT) and on per hectare basis (kg)**

| Year    | Total Consumption (in lakh MT) | Per hectare consumption (kg) |
|---------|--------------------------------|------------------------------|
| 2015-16 | 59.63                          | 122.5                        |
| 2016-17 | 61.74                          | 126.1                        |
| 2017-18 | 61.69                          | 124.0                        |
| 2018-19 | 62.10                          | 124.8                        |

Source: Economic Survey of Maharashtra 2018-19

As per Economic survey of Maharashtra 2018-19, the region wise usage of nitrogenous, phosphatic and potassic chemical fertilizers for the year 2017-18 and anticipated use in the year 2018-19 are as indicated in the table below.

**Table 39: Region-wise use of Chemical Fertilizer (in '00 MT)**

| Chemical fertilizers | Year    | Konkan       | Nashik       | Pune         | Aurangabad   | Amravati     | Nagpur       |
|----------------------|---------|--------------|--------------|--------------|--------------|--------------|--------------|
| Nitrogenous          | 2017-18 | 366          | 3762         | 3,739        | 3,814        | 1,649        | 1,765        |
| Phosphatic           |         | 71           | 2,084        | 1,823        | 2,602        | 1,265        | 959          |
| Potassic             |         | 56           | 1,786        | 1,480        | 1,286        | 566          | 362          |
| Total                |         | 493          | 7,632        | 7,042        | 7,702        | 3,481        | 3,086        |
| Nitrogenous          | 2018-19 | 556          | 3,864        | 4,381        | 4,532        | 1,587        | 1,420        |
| Phosphatic           |         | 235          | 2,030        | 2,397        | 3,042        | 1,254        | 809          |
| Potassic             |         | 268          | 1,882        | 2,283        | 1,957        | 631          | 443          |
| Total                |         | <b>1,059</b> | <b>7,776</b> | <b>9,061</b> | <b>9,531</b> | <b>3,472</b> | <b>2,672</b> |

Source: Economic survey of Maharashtra 2018-19

The above data shows that fertilizer consumption is higher in Aurangabad, Pune and Nashik regions of Maharashtra.

Utilization of fertilizer nutrients by crops vary from 30 – 50 percent in case of Nitrogen, 15 – 20 percent in case of phosphorous and less than 5 percent in case of micronutrients. Fertilizers are mostly used for crops such as cotton, sugarcane, banana, tomato, chilly and onion. However, 70 percent fertilizer is applied for cotton and very less quantity for pulses and oil seeds<sup>8</sup>.

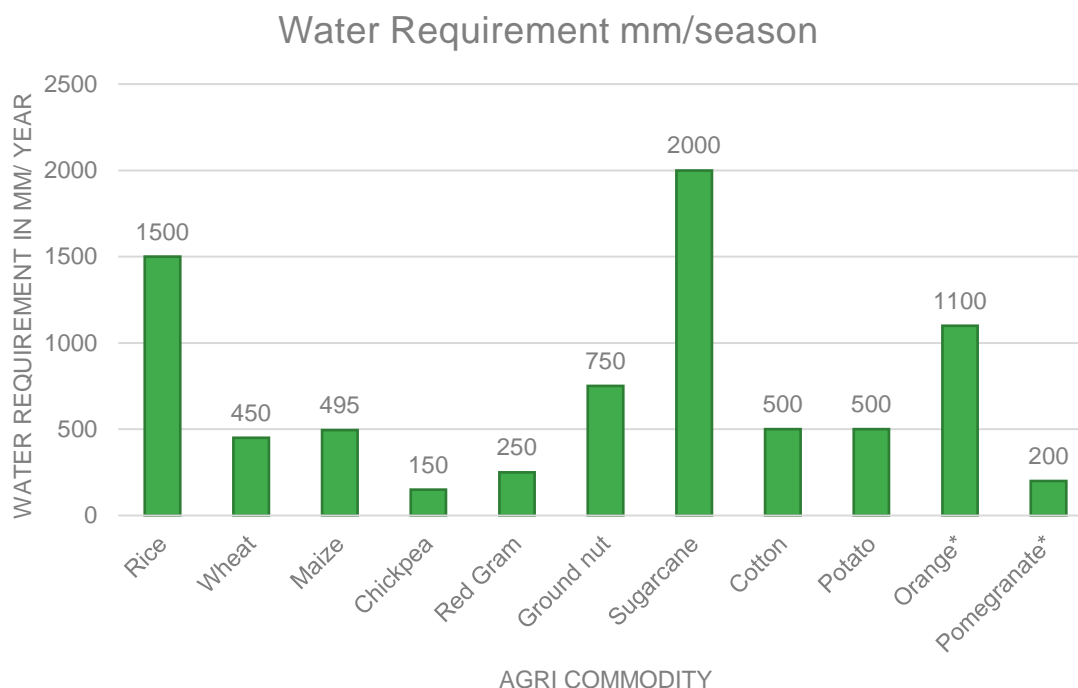
Studies have shown that soil which receives plant nutrients only through chemical fertilizers showed a decline in productivity, despite being supplied by enough nutrients through fertilizers. The decline of productivity is attributed to deficiency in secondary and micronutrients. The physical condition of soil deteriorates due to long-term use of chemical fertilizers especially the nitrogenous ones. Further, excess use of nitrogenous fertilizers leads to ground water and environmental pollution apart from destroying the ozone layer through N<sub>2</sub>O production.

#### 4.2.14 Crop Wise Water Requirement

Roots take water from the soil. This water dissolved with nutrients from the soil is transported to the plant for use. Water is thereafter released into the atmosphere by the plants through the process of transpiration. The water needs of a crop is usually expressed in mm/day, mm/month or mm/season. Irrigated water can be stored in the soil around the root zone and can be gradually utilized by the plant. Water requirement of some of the major crops grown in Maharashtra are as indicated below:

<sup>8</sup> Comprehensive District Agricultural Plan 2012-17, Department of Agriculture and allied Departments. Government of Maharashtra.

**Figure 15: Crop Wise Water Requirement (mm/year)**



Source: Water productivity mapping of major Indian crops by NABARD; Note: For orange and pomegranate its mm /year, 2018

#### 4.2.15 Crop Varieties and Yield / Productivity

As per water productivity mapping of major Indian crops by NABARD, the yield of some crop varieties are as follows:

- Rice – 3.6 MT / Ha World average is 4.5 MT/ Ha Total land area under rice cultivation in Maharashtra is 14.1 lakh Ha and production is 17.47 lakh MT
- Wheat – 3.1 MT / Ha World average is 3.31 MT/ Ha Maharashtra productivity is low at 1.7 MT / Ha
- Maize – 3.04 MT / Ha Total land under Maize cultivation in Maharashtra is 6 lakh Ha Maharashtra maize productivity is low at 2.74 MT / Ha
- Chickpea / Gram – 0.9 MT / Ha Total land under gram cultivation in Maharashtra is 13.1 lakh Ha and the yield is 0.89 MT / Ha
- Red Gram – 0.66 MT / Ha Total land under red gram cultivation in Maharashtra is 11.6 lakh Ha and the yield is 0.79 MT / Ha
- Groundnut – 1.3 MT / Ha Total land under groundnut cultivation in Maharashtra is 2.6 lakh Ha and the yield is 1.15 MT / Ha
- Cotton – 0.542 MT lint / Ha Which is lower than the world average of 0.784 MT Lint / Ha Total land under Cotton production in Maharashtra is 35.4 Lakh Ha
- Potato – 15.32 MT / Ha

As per Department of Horticulture report 2017, Maharashtra holds the second position amongst major fruit producing states in the country with 11.2 percent share (103.78 Lakh M.T). The state holds 6<sup>th</sup> position in terms of vegetable production with 5.9 percent share (10.36 Lakh M.T).

As per Horticulture Statistics at a Glance 2017, yield of horticulture produce in the State is as shown in table below.

**Table 40: Crop Area and Production in Maharashtra (2016-17)**

| S. No. | Crop           | Area (lakh Ha) | Production (in '000 M.T) | Yield MT/Ha |
|--------|----------------|----------------|--------------------------|-------------|
| 1      | Pomegranate    | 1.37           | 1578                     | 11.54       |
| 2      | Sapota         | 0.18           | 156                      | 12.84       |
| 3      | Beans          | 0.05           | 45                       | 9.27        |
| 4      | Bottle Guard   | 0.02           | 36                       | -           |
| 5      | Cabbage        | 0.09           | 189                      | 21.22       |
| 6      | Cucumber       | 0.05           | 62                       | -           |
| 7      | Chillies (dry) | 0.17           | 35.9                     | 2.08        |
| 8      | Okra           | 0.14           | 148                      | 10.26       |
| 9      | Onion          | 4.72           | 6773                     | 14.36       |
| 10     | Potato         | 0.23           | 541                      | 23.71       |
| 11     | Tomato         | 0.44           | 957                      | 21.93       |
| 12     | Watermelon     | 0.06           | 176                      | -           |
| 13     | Mandarin       | 1.08           | 985                      | 9.16        |
| 14     | Sweet Lime     | 0.55           | 657                      | -           |
| 15     | Grapes         | 1.04           | 2138                     | 20.56       |
| 16     | Mango          | 1.57           | 515                      | 3.28        |

## 5 Stakeholder Consultation Analysis

The stakeholder analysis process for the ESMF of the proposed project aims to identify and classify project stakeholders that include beneficiaries and any individual or group who is potentially affected by a project/ activity or can themselves affect or influence a project/ activity.

This section assesses outcome of the stakeholder consultations and their responses in the context of SMART. This includes perceptions and concerns raised by individuals and groups on the prevailing status of the agriculture sector in the state and any expectations that they may have from the proposed activities under the project.

Focused Group Discussions and semi-structured interviews were conducted in order to involve all the stakeholders in the agriculture value chain. To get a representative sample, each commodity identified under SMART was studied to identify the agroclimatic zone which best represent the commodity value chain. Once the commodity and corresponding agroclimatic zone were finalized, the selection of CBO for a commodity was done on a random basis. During the stakeholder consultation with the CBOs, corresponding value chain linkages were identified such as Market, Retailers, Traders, Food Processing Industries. To the extent possible the linkages were also consulted, and their feedback were noted, to cover a representative sample across the entire value chain. During the stakeholder consultation process, small and marginal farmers were also interviewed to get their specific issues and feedbacks. The key inputs that have been used to develop this analysis are:

- Results of 20 CBOs, covering eight commodities and 22,133 farmers.

### 5.1 Stakeholder Identification and Profiling

Stakeholder identification and profiling is essential to develop an engagement strategy and information disclosure process that is tailored to the needs of different stakeholder groups as well as to prioritise the available project resources. The table below illustrates the spectrum of stakeholders that were engaged with as part of ESMF:

**Table 41: Stakeholder identification and profiling for SMART project**

| Particular                                                                   | State | District | Block/Cluster | Village |
|------------------------------------------------------------------------------|-------|----------|---------------|---------|
| <b>State level</b>                                                           |       |          |               |         |
| Department of Agriculture/ATMA                                               |       |          |               |         |
| Agri Marketing                                                               |       |          |               |         |
| Animal Husbandry                                                             |       |          |               |         |
| Maharashtra State Rural Livelihood Mission (MSRLM).                          |       |          |               |         |
| Mahila Arthik Vikas Mahamandal (MAVIM)                                       |       |          |               |         |
| Corporate Engagement through Village Social Transformation Foundation (VSTF) |       |          |               |         |
| <b>Agriculture value-chain players</b>                                       |       |          |               |         |
| Farmers                                                                      |       |          |               |         |
| Aggregators                                                                  |       |          |               |         |

| Particular                   | State | District | Block/Cluster | Village |
|------------------------------|-------|----------|---------------|---------|
| Commission Agents            |       |          |               |         |
| Traders                      |       |          |               |         |
| Retailers                    |       |          |               |         |
| Market                       |       |          |               |         |
| <b>Institution Level</b>     |       |          |               |         |
| CLFs                         |       |          |               |         |
| CMRCs                        |       |          |               |         |
| FPOs                         |       |          |               |         |
| FPCs                         |       |          |               |         |
| PACS                         |       |          |               |         |
| SHGs/Farmer Groups           |       |          |               |         |
| <b>Primary Producers</b>     |       |          |               |         |
| General                      |       |          |               |         |
| SC/ ST                       |       |          |               |         |
| Women / WHH                  |       |          |               |         |
| Sheep & Goat rearing farmers |       |          |               |         |

The stakeholder profile varies not only owing to the socio-economic conditions, but also because of their vulnerabilities. The expectations and the impact of these stakeholders on the project will therefore signify variations depending on their abilities to participate and benefit from the project activities. It is therefore important that the stakeholder profile is captured, and SMART appreciates the existing variations. It should be noted that the identification and management of stakeholders is an iterative process requiring change and regular review.

The following tables puts across the outcomes of the stakeholder analysis in a better perspective, as well as help in making informed decisions on the projects.

**Table 42: Definition for the Quadrants**

| Quadrant                           | What they mean                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| High Influence and High Importance | These stakeholders are important to the implementation of the project and can affect the project outcomes. They may be a source of catalysing the project as well as pose significant risk if their interests do not converge with the project. These stakeholders would need to be engaged in an appropriate and positive manner.                |
| Low Influence and High Importance  | These stakeholders are important to the implementation of the project but may have limited influence on project outcomes. Their capacities and involvement in the project would have to be suitably enhanced. Lack of their participation and involvement in the project may pose a risk to the success of the project.                           |
| High Influence and Low Importance  | Stakeholders in this quadrant would require limited consultation. They are unlikely to be affected by the projects activities or outcomes but may have the potential to impact project outcomes. Therefore, the actions of such stakeholders would need careful monitoring and will have to be backed with appropriate actions under the project. |
| Low Influence and Low importance   | These stakeholders will need to be consulted but may not know how the issue affects them. People very low on the influence scale may need methods and attention.                                                                                                                                                                                  |
| Beneficiaries                      | In the case of these stakeholders the capacity needs to be built in keeping the special societal and cultural needs. Capacity building is important to ensure that they can maximise output from the various input services or other engagements envisaged under the project.                                                                     |

| Quadrant            | What they mean                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project Manager (s) | Manager(s) are crucial in terms of planning for the project. They continue to have control over the projects, and their understanding based on the monitoring and evaluation and regular reporting shapes the improvement in the project design. Their capacity and systems to understand the special needs of the beneficiaries and incorporate changes in programmes suiting the special needs based on field level indicators is crucial for the project. |
| Decision Makers     | Decision makers shape the policy and regulations crucial to maximise the benefits under the project. They need to well align with the managers to incorporate or address any major shift in the policy and is likely to have huge impact.                                                                                                                                                                                                                    |
| Affected People     | <b>Affected people are those types of stakeholders which have minimal linkage with the project, however are likely to be impacted in case of implementation of the project. In most of the cases, they must adjust to the impacts or need to have high influence to ensure changes to mitigate the impacts.</b>                                                                                                                                              |

**Table 43: Matrix assessing the various stakeholders presently involved in SMART**

| Stakeholders                            | Influencers | Importance | Beneficiaries | Managers | Decision makers | Affected groups |
|-----------------------------------------|-------------|------------|---------------|----------|-----------------|-----------------|
| Line Departments                        | √           | High       | √             | √        | √               |                 |
| Value-chain actors                      | √           | High       | √             | √        | √               |                 |
| Board of Directors                      | √           | High       | √             | √        | √               |                 |
| Small and Marginal farmers              |             | Low        | √             |          |                 | √               |
| Large farmers                           | √           | High       | √             |          |                 |                 |
| Block level officials / Zilla Panchayat |             | Medium     |               |          | √               |                 |
| Women                                   |             | Low        | √             |          |                 | √               |
| SC/ST and other vulnerable Population   |             | Low        | √             |          |                 | √               |
| Training Institutes                     |             | Moderate   |               |          | √               |                 |

## 5.2 Analysis of Stakeholder Consultation

Based on the stakeholder analysis and profiling of the various stakeholders, various concerns and challenges have emerged. The following tables highlights concerns of beneficiaries as producers and beneficiaries in the value chain. A crop-wise compilation of issues faced by the stakeholders is provided in the following table.

**Table 44: Key Findings of Stakeholder Consultations**

| Commodities | Key issues and challenges                                                                                                                                                               |                                                                                                                     |                                                                                                                                                 |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
|             | Production                                                                                                                                                                              | Post-harvest                                                                                                        | Marketing                                                                                                                                       |
| Paddy       | <ul style="list-style-type: none"> <li>Higher cost of labour during sowing</li> <li>Higher cost of fertilizer</li> <li>Need for advanced machineries</li> <li>Lower rainfall</li> </ul> | Lack of storage facility                                                                                            | <ul style="list-style-type: none"> <li>Distance from market making transportation, an issue</li> <li>Lack of facilities on marketing</li> </ul> |
| Maize       | <ul style="list-style-type: none"> <li>Pest attacks</li> <li>Higher cost of seeds and fertilizers</li> <li>Higher cost of labour</li> </ul>                                             | <ul style="list-style-type: none"> <li>Lack of storage facility</li> <li>Lack of labourers' availability</li> </ul> | <ul style="list-style-type: none"> <li>Distance from market</li> <li>Fluctuating prices</li> </ul>                                              |

## Commodities Key issues and challenges

| Commodities | Key issues and challenges                                                                                                                                |                                                                                                                                                                               |                                                                                                                                                                                             |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             |                                                                                                                                                          | <ul style="list-style-type: none"> <li>Lack of pre-cooling and drying facilities</li> <li>Shortage of working capital</li> </ul>                                              |                                                                                                                                                                                             |
| Wheat       | <ul style="list-style-type: none"> <li>Pest and diseases attacks</li> <li>Higher cost of seeds and fertilizers</li> <li>Higher cost of labour</li> </ul> | Clearing the field                                                                                                                                                            | <ul style="list-style-type: none"> <li>Distance from market</li> <li>Realizing optimal prices for produce</li> </ul>                                                                        |
| Chillies    | <ul style="list-style-type: none"> <li>Attack of leaf curl disease</li> <li>Higher cost of labour</li> </ul>                                             | <ul style="list-style-type: none"> <li>Lack of drying facilities</li> <li>Lack of advanced technologies in processing</li> </ul>                                              | <ul style="list-style-type: none"> <li>Lack of packaging facilities</li> <li>Lack of marketing facilities</li> </ul>                                                                        |
| Cashews     | <ul style="list-style-type: none"> <li>High cost of fertilizers</li> <li>Low rainfall</li> </ul>                                                         | Lack of storage facilities                                                                                                                                                    | <ul style="list-style-type: none"> <li>Lack of suitable transport facilities</li> <li>Lack of suitable retailers</li> </ul>                                                                 |
| Jowar       | <ul style="list-style-type: none"> <li>Proper moisture at the time of sowing</li> <li>Diseases and pest attacks</li> <li>Untimely rains</li> </ul>       | <ul style="list-style-type: none"> <li>Timely harvest avoiding broken grains</li> <li>Lack of drying, cleaning and grading facilities</li> </ul>                              | <ul style="list-style-type: none"> <li>Attractive packaging to improve marketability</li> <li>Reliable pricing mechanism for selling</li> </ul>                                             |
| Gram        | Untimely rains                                                                                                                                           | <ul style="list-style-type: none"> <li>Lack of storage facilities</li> <li>Lack of sorting and grading facilities</li> </ul>                                                  | <ul style="list-style-type: none"> <li>Lack of packaging facilities</li> <li>Realizing optimal prices for produce</li> </ul>                                                                |
| Cotton      |                                                                                                                                                          | Need for processing facilities at FPC such as bale breaker etc.                                                                                                               |                                                                                                                                                                                             |
| Soy bean    | <ul style="list-style-type: none"> <li>Diseases and pest attacks</li> <li>Untimely rains</li> <li>Higher cost of seeds and fertilizers</li> </ul>        | <ul style="list-style-type: none"> <li>Lack of storage facilities</li> <li>Higher cost of labour and need for harvesting equipment</li> </ul>                                 | Fluctuating prices                                                                                                                                                                          |
| Turmeric    |                                                                                                                                                          | <ul style="list-style-type: none"> <li>Shortage of processing machineries</li> <li>Lack of storage facilities</li> </ul>                                                      | <ul style="list-style-type: none"> <li>Low price realization</li> <li>Lack of marketing facilities</li> </ul>                                                                               |
| Pomegranate | <ul style="list-style-type: none"> <li>Higher cost of seeds and fertilizers</li> <li>Higher cost of labour</li> </ul>                                    | <ul style="list-style-type: none"> <li>Lack of storage including cold storage facilities</li> <li>Lack of processing facilities</li> </ul>                                    | <ul style="list-style-type: none"> <li>Requirement of branding</li> <li>Product is marketable in metropolitan areas and transportation is an issue</li> <li>Handling competition</li> </ul> |
| Banana      | Control of viral diseases                                                                                                                                | <ul style="list-style-type: none"> <li>Fixing of purchase prices</li> <li>Handling and storage of fruits; requirement of reefer vans, fork lift and pallet trucks</li> </ul>  | <ul style="list-style-type: none"> <li>Fluctuating prices with price variation between export and local markets (as prices lower)</li> </ul>                                                |
| Onion       | <ul style="list-style-type: none"> <li>Diseases and pest attacks</li> <li>Higher cost of seeds and fertilizers</li> <li>Higher cost of labour</li> </ul> | <ul style="list-style-type: none"> <li>Fixing of purchase prices</li> <li>Lack of storage facilities</li> <li>Lower availability of labour and higher labour costs</li> </ul> | Fluctuating prices                                                                                                                                                                          |
| Millets     |                                                                                                                                                          | Inadequate processing facilities                                                                                                                                              | <ul style="list-style-type: none"> <li>Requirement of branding</li> <li>Lack of marketing facilities</li> </ul>                                                                             |
| Brinjal     | Control of pests and diseases                                                                                                                            |                                                                                                                                                                               | Fluctuating prices                                                                                                                                                                          |
| Tomato      | <ul style="list-style-type: none"> <li>Diseases and pest attacks</li> <li>Higher cost of seeds and fertilizers</li> </ul>                                |                                                                                                                                                                               | <ul style="list-style-type: none"> <li>Fluctuating prices</li> <li>Lack of adequate marketing opportunities including export</li> </ul>                                                     |

| Commodities                                     | Key issues and challenges                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                              |                                                                                                              |
|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Grapes                                          | Climatic variations                                                                                                                                                                                                                                                                                                                                                                                                                          | <ul style="list-style-type: none"> <li>Requirement of pre-cooling vans</li> <li>Requirement of primary storage at territory level</li> </ul> | Lack of organized domestic markets with stable prices and timely payments                                    |
| Potato                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                              | Lack of cold storage facilities                                                                                                              | Lack of access to suitable markets                                                                           |
| Chikoo                                          | <ul style="list-style-type: none"> <li>Tree rejuvenation cost is higher</li> <li>Higher cost of fertilizers</li> </ul>                                                                                                                                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>Higher cost of labourers</li> <li>Lack of adequate food processing units</li> </ul>                   | <ul style="list-style-type: none"> <li>Distance from market</li> <li>Lack of marketing facilities</li> </ul> |
| Goat rearing                                    | <ul style="list-style-type: none"> <li>Requirement of weighing machine for goats</li> <li>Requirement of storage facilities for fodder</li> <li>Requirement of shelter for goats</li> <li>Requirement of training on nutrition of goats</li> <li>Requirement of mini slaughter houses</li> <li>Non-availability of water for goats during summer season</li> <li>Lack of marketing facilities and hence exploitation by middlemen</li> </ul> |                                                                                                                                              |                                                                                                              |
| Slaughter houses                                | Facility underutilized and facing losses; attempts made to privatise facility but employees protesting against it                                                                                                                                                                                                                                                                                                                            |                                                                                                                                              |                                                                                                              |
| Retail                                          | <ul style="list-style-type: none"> <li>Lack of cold storage facilities</li> <li>Inadequate warehousing facilities</li> <li>Irregular supply of commodities</li> </ul>                                                                                                                                                                                                                                                                        |                                                                                                                                              |                                                                                                              |
| Traders                                         | <ul style="list-style-type: none"> <li>Lack of cold storage facilities</li> <li>Inadequate warehousing facilities</li> <li>Lack of grading and packing facilities</li> </ul>                                                                                                                                                                                                                                                                 |                                                                                                                                              |                                                                                                              |
| Processed food industry for chikoo, mango, amla | Marketing and branding of produce                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                              |                                                                                                              |
| Banks                                           | Banks wary of providing loans to farmers due to lack of repayment as mentioned in one district; however, MSRLM consultations with bank officials reveal that they are willing to lend to FPOs, with RBI guidelines                                                                                                                                                                                                                           |                                                                                                                                              |                                                                                                              |

Source: Field survey

A detailed illustration of feedbacks received during stakeholder consultation along with photographs of representative samples are presented in **Appendix G** of the report.

The table below highlights some of the key issues emerging from the stakeholder analysis for the vulnerable groups, and mitigation measures:

**Table 45: Key issues emerging from the stakeholder analysis and suggested measures**

| Stakeholder | Issues                                                                                    | Suggested measures                                                                       |
|-------------|-------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| Women       | Inadequate representation in general CBOs                                                 | In the village level institutions, efforts to be made to enrol women as members          |
|             | Lack of capacity to represent issues related to them in CBOs                              | Training and capacity building programmes especially targeting women                     |
|             | Lack of leadership for their effective participation and decision making at CBO/FPO level | Promoting women participation in various extension activities proposed under the Project |
|             | Lack of access to institutional credit                                                    | Linkages with banks and assistance in loan approvals                                     |

| Stakeholder                              | Issues                                                                                 | Suggested measures                                                                                                                                                                                                                                                                                                     |
|------------------------------------------|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                          | Lack of access to market / market knowledge                                            | Capacity building and information dissemination in local language (vernacular)                                                                                                                                                                                                                                         |
| SC/ST                                    | Lack of specific information related to existing participation levels                  | <ul style="list-style-type: none"> <li>• In the village level institutions, information generation on their participation</li> <li>• Training and capacity building programmes especially targeting SC/ST members</li> <li>• Promoting SC/ST participation in various activities proposed under the Project</li> </ul> |
|                                          | Lack of capacity to represent issues related to them                                   |                                                                                                                                                                                                                                                                                                                        |
|                                          | Lack of leadership for their effective participation and decision making at CBO levels |                                                                                                                                                                                                                                                                                                                        |
|                                          | Lack of access to land                                                                 |                                                                                                                                                                                                                                                                                                                        |
|                                          | Lack of access to institutional credit                                                 |                                                                                                                                                                                                                                                                                                                        |
|                                          | Lack of awareness on access to government schemes                                      |                                                                                                                                                                                                                                                                                                                        |
|                                          | Lack of alternate fall-back options for income                                         |                                                                                                                                                                                                                                                                                                                        |
|                                          | Limited understanding on value-chain and management                                    |                                                                                                                                                                                                                                                                                                                        |
| Landless and Other vulnerable population | Lack of access to employment opportunities                                             | <ul style="list-style-type: none"> <li>• In the village level institutions, efforts to promote their engagement, especially in MAP</li> <li>• Training and capacity building programmes especially targeting landless and other vulnerable</li> </ul>                                                                  |
|                                          | Lack of access to institutional credit                                                 |                                                                                                                                                                                                                                                                                                                        |
|                                          | Lack of access to government support                                                   |                                                                                                                                                                                                                                                                                                                        |
|                                          | Lack of access to trainings                                                            |                                                                                                                                                                                                                                                                                                                        |
|                                          | Lack of alternate fall-back options                                                    |                                                                                                                                                                                                                                                                                                                        |

### 5.3 Stakeholder Engagement Plan

SMART will regularly engage with project stakeholders throughout the project’s lifecycle. This would be in line with the World Bank’s requirement for stakeholder engagement, detailed in the Environmental and Social Framework (ESF), which came into effect on October 1, 2018.

This section defines a strategy for stakeholder engagement (SEP), including public information disclosure and consultation, throughout the designing and implementation of SMART. The SEP outlines the ways in which PCMU and PIUs will communicate with stakeholders and includes a mechanism by which people can raise concerns, provide feedback<sup>9</sup>, or make complaints about SMART, the PIU, and the project(s) themselves.

The involvement of the local population is essential to the success of SMART in order to ensure smooth collaboration between project staff and local communities and to minimize and mitigate environmental and social risks related to the proposed project(s). As part of SEP first step is identification of relevant stakeholders for SMART, as mentioned in section 5.1 above. The table below specifies **the key planned stakeholder engagement activities** that SMART must take up during the course of project.

<sup>9</sup> Details on the GRM is provided in the subsequent sections

**Table 46: Planned stakeholder engagement activities**

| Stage                                                                                                  | Target stakeholders                                                                                                                                                                                                                                                 | Topic (s) of engagement                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Method(s) used                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Location / frequency                                                                                                                                                                                                                                                                                                                                                                                                                              | Responsibilities                                                                                                                                                                        |
|--------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| STAGE 1: PROJECT PREPARATION (PROJECT DESIGN, SCOPING, RESETTLEMENT PLANNING, ESMF/RPF/SEP DISCLOSURE) | <b>Project Affected People:</b> <ul style="list-style-type: none"> <li>● People potentially affected by land acquisition</li> <li>● People residing in project area</li> <li>● Vulnerable households</li> </ul>                                                     | <ul style="list-style-type: none"> <li>● ESMF, ESMP, RPF, SEP, RAP (if prepared) disclosures</li> <li>● Land acquisition process</li> <li>● Assistance in gathering official documents for authorized land uses</li> <li>● Compensation rates, methodology</li> <li>● Compensation packages</li> <li>● Project scope and rationale</li> <li>● Project E&amp;S principles</li> <li>● Resettlement and livelihood restoration options</li> <li>● Grievance mechanism process</li> </ul> | <ul style="list-style-type: none"> <li>● Public meetings, separate meetings for women and vulnerable</li> <li>● Face-to-face meetings</li> <li>● Mass/social media communication (as needed- content to be in local language)</li> <li>● Disclosure of written information: brochures, posters, flyers, website Information boards or desks - In Talathi office / CBOs (in local language)</li> <li>● Grievance mechanism</li> <li>● SMART monthly newsletter (if available)</li> </ul> | <ul style="list-style-type: none"> <li>● In project collector's office, Tehsildar's office and Panchayat <i>Bhawan (village)</i> for disclosure of Drafts ESMF, RPF, SEP, RAP (if triggered)</li> <li>● In Talathi / Tehsildar's office at beginning of construction that would affect the area</li> <li>● Continuous communication through mass/social media and routine interactions</li> <li>● Throughout RAP development as needed</li> </ul> | <ul style="list-style-type: none"> <li>● PCMU team</li> <li>● PIU / Specialists responsible for land acquisition</li> <li>● RAP consultant</li> </ul>                                   |
|                                                                                                        | <b>Other Interested Parties (External)</b> <ul style="list-style-type: none"> <li>● Collector, Tehsildar, Talathi in districts / block</li> <li>● Representatives in villages</li> </ul>                                                                            | <ul style="list-style-type: none"> <li>● ESMF, ESMP, RPF, SEP, RAP disclosures</li> <li>● Land acquisition process</li> <li>● Identification of land plots and uses</li> <li>● Resettlement and livelihood restoration options (if needed)</li> <li>● Project scope, rationale and E&amp;S principles</li> <li>● Grievance mechanism process</li> </ul>                                                                                                                               | <ul style="list-style-type: none"> <li>● Face-to-face meetings</li> <li>● Joint public/community meetings with PAPs</li> </ul>                                                                                                                                                                                                                                                                                                                                                          | <ul style="list-style-type: none"> <li>● Throughout RAP development as needed</li> <li>● Project launch meetings at the block level (tehsildar's office)</li> <li>● Quarterly meetings in affected villages and Tehsil / Block</li> <li>● Disclosure meetings in Panchayat and Block</li> </ul>                                                                                                                                                   | <ul style="list-style-type: none"> <li>● PCMU E&amp;S Team &amp; management</li> <li>● PIU</li> <li>● Specialists responsible for land acquisition</li> <li>● RAP consultant</li> </ul> |
|                                                                                                        | <b>Other Interested Parties (External)</b> <ul style="list-style-type: none"> <li>● Press and media</li> <li>● NGOs</li> <li>● Private players</li> <li>● Workers' organizations</li> <li>● Training institutions</li> <li>● Line Government Departments</li> </ul> | <ul style="list-style-type: none"> <li>● ESMF, ESMP, RPF, SEP, RAP disclosures</li> <li>● Grievance mechanism</li> <li>● Project scope, rationale and E&amp;S principles</li> </ul>                                                                                                                                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>● Public meetings, trainings/workshops (separate meetings specifically for women and vulnerable as needed)</li> <li>● Mass/social media communication</li> <li>● Disclosure of written information: Brochures, posters, flyers, website</li> <li>● Information boards or desks in Panchayat</li> <li>● Grievance mechanism</li> </ul>                                                                                                            | <ul style="list-style-type: none"> <li>● Project launch meetings in Block</li> <li>● Meetings in affected villages and blocks, as needed</li> <li>● Communication through mass/social media (as needed)</li> <li>● Information desks with brochures/posters in</li> </ul>                                                                                                                                                                         | <ul style="list-style-type: none"> <li>● PCMU</li> <li>● PCMU E&amp;S team</li> <li>● PIU coordinator / Social Specialist</li> </ul>                                                    |

| Stage                                             | Target stakeholders                                                                                                                                                                                                                                               | Topic (s) of engagement                                                                                                                                                                                                                                                                                               | Method(s) used                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Location / frequency                                                                                                                                                                                                                                                          | Responsibilities                                                                                                                                                                                   |
|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                   |                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>● Notice board for employment recruitment, in case of civil works</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                        | affected villages (continuous)                                                                                                                                                                                                                                                |                                                                                                                                                                                                    |
|                                                   | <b>Other Interested Parties (External)</b> <ul style="list-style-type: none"> <li>● Other Government Departments from which permissions/clearances are required;</li> <li>● Other project developers, donors</li> </ul>                                           | <ul style="list-style-type: none"> <li>● Legal compliance issues</li> <li>● Project information scope and rationale and E&amp;S principles</li> <li>● Coordination activities</li> <li>● Land acquisition process</li> <li>● Grievance mechanism process</li> <li>● ESMF/ESMP/RPF/SEP disclosures</li> </ul>          | <ul style="list-style-type: none"> <li>● Face-to-face meetings</li> <li>● Invitations to public / community meetings</li> <li>● Submission of required reports</li> </ul>                                                                                                                                                                                                                                                                                                                                  | <ul style="list-style-type: none"> <li>● Disclosure meetings</li> <li>● Reports as required</li> </ul>                                                                                                                                                                        | <ul style="list-style-type: none"> <li>● PCMU</li> <li>● PCMU E&amp;S team</li> <li>● PIU Coordinator / social specialist</li> </ul>                                                               |
|                                                   | <b>Other Interested Parties (Internal)</b> <ul style="list-style-type: none"> <li>● Other block / tehsil staff</li> <li>● Supervision Consultants</li> <li>● Supervision contractors, sub-contractors, service providers, suppliers, and their workers</li> </ul> | <ul style="list-style-type: none"> <li>● Project information: scope and rationale and E&amp;S principles</li> <li>● Training ESMF/ESMP requirements and other management plans</li> <li>● Grievance mechanism process</li> <li>● E&amp;S requirements</li> <li>● Feedback on consultant/contractor reports</li> </ul> | <ul style="list-style-type: none"> <li>● Face-to-face meetings</li> <li>● Trainings/workshops</li> <li>● Invitations to public/community meetings</li> </ul>                                                                                                                                                                                                                                                                                                                                               | As needed                                                                                                                                                                                                                                                                     | <ul style="list-style-type: none"> <li>● PCMU</li> <li>● PCMU E&amp;S team</li> <li>● PIU coordinator / social specialist</li> </ul>                                                               |
| STAGE 2: CONSTRUCTION AND MOBILIZATION ACTIVITIES | <b>Project Affected People</b> <ul style="list-style-type: none"> <li>● People potentially affected by land acquisition</li> <li>● People residing in project area</li> <li>● Vulnerable households</li> </ul>                                                    | <ul style="list-style-type: none"> <li>● Grievance mechanism</li> <li>● Health and safety impacts (EMF, community H&amp;S, community concerns)</li> <li>● Employment opportunities</li> <li>● Project status</li> </ul>                                                                                               | <ul style="list-style-type: none"> <li>● Public meetings, open houses, trainings/workshops</li> <li>● Separate meetings as needed for women and vulnerable</li> <li>● Individual outreach to PAPs as needed</li> <li>● Disclosure of written information: brochures, posters, flyers, website</li> <li>● Information boards in Panchayats</li> <li>● Notice board(s) at construction sites (in local language)</li> <li>● Grievance mechanism</li> <li>● SMART monthly newsletter, if available</li> </ul> | <ul style="list-style-type: none"> <li>● Quarterly meetings during construction seasons</li> <li>● Communication through mass/social media as needed</li> <li>● Notice boards updated weekly</li> <li>● Routine interactions</li> <li>● Brochures in local offices</li> </ul> | <ul style="list-style-type: none"> <li>● PCMU</li> <li>● Management team</li> <li>● PCMU E&amp;S staff</li> <li>● Supervision and RAP consultants</li> <li>● Contractor/sub-contractors</li> </ul> |
|                                                   | <b>Other Interested Parties (External)</b> <ul style="list-style-type: none"> <li>● Governmental committees for land use and compensation</li> <li>● Talathi and representatives in villages</li> </ul>                                                           | <ul style="list-style-type: none"> <li>● Project scope, rationale and E&amp;S principles</li> <li>● Grievance mechanism</li> <li>● Project status</li> </ul>                                                                                                                                                          | <ul style="list-style-type: none"> <li>● Face-to-face meetings</li> <li>● Joint public/community meetings with PAPs</li> </ul>                                                                                                                                                                                                                                                                                                                                                                             | As needed (monthly during construction season)                                                                                                                                                                                                                                | <ul style="list-style-type: none"> <li>● PCMU management</li> <li>● PCMU E&amp;S staff</li> </ul>                                                                                                  |

| Stage                                     | Target stakeholders                                                                                                                                                                                                                                                                                               | Topic (s) of engagement                                                                                                                                                                                                                                                              | Method(s) used                                                                                                                                                                                                                                                                                           | Location / frequency                                                                                                                                                   | Responsibilities                                                                                                                                                   |
|-------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                           |                                                                                                                                                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>World Bank compensation requirements</li> </ul>                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                        | <ul style="list-style-type: none"> <li>PIU coordinator / social specialist</li> <li>Supervision and RAP consultants</li> <li>Contractor/sub-contractors</li> </ul> |
|                                           | <b>Other Interested Parties (External)</b> <ul style="list-style-type: none"> <li>Press and media</li> <li>NGOs</li> <li>Businesses and business organizations</li> <li>Workers' organizations</li> <li>Training Institutions</li> <li>State departments</li> <li>General public, tourists, jobseekers</li> </ul> | <ul style="list-style-type: none"> <li>Project information - scope and rationale and E&amp;S principles</li> <li>Project status</li> <li>Health and safety impacts</li> <li>Employment opportunities</li> <li>Environmental concerns</li> <li>Grievance mechanism process</li> </ul> | <ul style="list-style-type: none"> <li>Public meetings, open houses, trainings/workshops</li> <li>Disclosure of written information: brochures, posters, flyers, website, Information boards in block / Panchayat</li> <li>Notice board(s) at construction sites</li> <li>Grievance mechanism</li> </ul> | Same as for PAPs                                                                                                                                                       | <ul style="list-style-type: none"> <li>PCMU management</li> <li>PCMU E&amp;S staff</li> <li>PIU coordinator / social specialist</li> </ul>                         |
|                                           | <b>Other Interested Parties (Internal)</b> <ul style="list-style-type: none"> <li>Other district / block / village staff</li> <li>Supervision Consultants</li> <li>Contractor, sub-contractors, service providers, suppliers and their workers</li> </ul>                                                         | <ul style="list-style-type: none"> <li>Project information: scope and rationale and E&amp;S principles</li> <li>Training on ESMF/ESMP requirements and other sub-management plans</li> <li>Worker grievance mechanism</li> </ul>                                                     | <ul style="list-style-type: none"> <li>Face-to-face meetings</li> <li>Trainings/workshops</li> <li>Invitations to public/community meetings</li> </ul>                                                                                                                                                   | Daily, as needed                                                                                                                                                       | <ul style="list-style-type: none"> <li>PCMU management</li> <li>PCMU E&amp;S staff</li> <li>PIU</li> </ul>                                                         |
| <b>STAGE 3: OPERATION AND MAINTENANCE</b> | <b>Project Affected People:</b> <ul style="list-style-type: none"> <li>People residing in project area</li> <li>Vulnerable households</li> </ul>                                                                                                                                                                  | <ul style="list-style-type: none"> <li>Satisfaction with engagement activities and GRM</li> <li>Grievance mechanism process</li> <li>Damage claim process</li> </ul>                                                                                                                 | <ul style="list-style-type: none"> <li>Outreach to individual PAPs</li> <li>SMART / PIU website</li> <li>Grievance mechanism</li> <li>SMART newsletter</li> </ul>                                                                                                                                        | <ul style="list-style-type: none"> <li>Outreach as needed</li> <li>Meetings in affected villages / CBOs (as needed/requested)</li> <li>Monthly (newsletter)</li> </ul> | <ul style="list-style-type: none"> <li>PCMU management</li> <li>PCMU E&amp;S team</li> </ul>                                                                       |
|                                           | <b>Other Interested Parties (External)</b> <ul style="list-style-type: none"> <li>Press and media</li> <li>NGOs</li> <li>Businesses and business organizations</li> <li>Workers' organizations</li> <li>Training institutions</li> <li>Local Government Departments</li> <li>General public, tourists</li> </ul>  | <ul style="list-style-type: none"> <li>Grievance mechanism process</li> <li>Issues of concern</li> <li>Status and compliance reports</li> </ul>                                                                                                                                      | <ul style="list-style-type: none"> <li>Grievance mechanism</li> <li>SMART website</li> <li>Face-to-face meetings</li> <li>Submission of reports as required</li> </ul>                                                                                                                                   | As needed                                                                                                                                                              | <ul style="list-style-type: none"> <li>PCMU management</li> <li>PCMU E&amp;S team</li> </ul>                                                                       |

## 5.4 Information disclosure

The SMART website will be used to disclose project documents, including those on environmental and social performance. This will begin with disclosure of this draft SEP and the draft ESMF and RPF. Besides the draft disclosure documents (and the final documents in future), project brochures and updates will be posted. An easy-to-understand guide to the terminology used in the environmental and social reports or documents will also be posted on the website. In addition, the site will provide details about the Grievance Redress Mechanism and contact details for the Grievance Redress Officers at the project and district / block levels. PCMU will update and maintain the website regularly, at least quarterly.

## 6 Potential Impact Assessment – Environment and Social

The Environmental and Social Management Framework (ESMF) prepared for SMART shall help in screening, assessment, management of environmental and social issues of the project at an early stage in project planning and integrate appropriate measures during the subproject design, implementation and operation. The framework will help provide specific guidance on the policies and procedures to be followed for environmental and social assessment along with roles and responsibilities of the implementing agencies.

### 6.1 Objectives of ESMF

The main objectives of the ESMF for SMART are to:

- Avoid any direct, indirect, potentially adverse and irreversible environmental and social impacts / risks of projects that it lends to;
- Minimize or mitigate adverse environmental and social impacts / risks;
- Ensure that environmental and social management plans meet the relevant requirements of regulations of GoM, and environmental and social safeguard requirements of The World Bank;
- Guide PCMU, and other stakeholders in preparing subprojects and / or activities for appraisal and in monitoring, reporting, and undertaking corrective actions, if any;
- Ensure that effective mechanisms are in place for safeguard compliance during project implementation, and to undertake corrective actions, if required; and
- Develop institutional capacity of stakeholder institutions on safeguard compliance, etc.

### 6.2 Social and environmental impact evaluation criteria

For the purpose of evaluating the impacts on various social aspects, the criterion has been developed based on understanding of the project and certain assumptions which were considered relevant in categorising the impacts. However, it is to be appreciated that the diversity of the impacts for the proposed activities under the SMART may at times be difficult to categorise; it is assumed that a rational attempt can be made towards categorising the impacts through the below mentioned significance criterion. Despite that, as the social and environmental impacts in some cases are interspersed, separate methods have been considered to categorise the impacts. The detail of the criterion that has been used to evaluate impacts on various social aspects is as following:

### 6.3 Context

The context refers to spatial or geographical extent of impact due to proposed project. The study proposes following classification of impacts:

- Local (low spread), when an impact is restricted within 500m of the project site;
- Medium (medium spread) when an impact is spread from 500m to 3km of the project site; and
- Regional (high spread) when impact is spread beyond 3km of the project site.

## 6.4 Duration

The duration of impact considers whether the impact would be short-term, medium-term or long-term and has been assessed based on the time taken to recover back to its pre-project state. For the proposed project, impacts were classified based on their existence in temporal scale as follows:

- Short term (low duration) when impacting for a duration of six months; this will result in the recovery of the effected component within a year
- Medium (medium duration) when impacting between six months and two years; this will result in the recovery of the effected component within 1 to 3 years
- Long term (high duration) when impacting beyond two years; and will result in recovery of prevailing conditions beyond 3 years.

## 6.5 Type

The type of impact refers to whether the effect is considered beneficial or adverse. Beneficial impacts would improve resource conditions. Adverse impacts would deplete or negatively alter resources.

To help understand, environmental and social issues associated with SMART, the PCMU undertook a study in nine agro-climatic zones, as well as, analysed data of 20 CBOs, covering eight commodities. Further, data from secondary sources was studied and analysed, and accordingly, an Environmental and Social Management Framework (ESMF) has been prepared, that ensures compliance of all project activities with the environmental regulations of GoM and the safeguard policies of the World Bank. The framework (ESMF) follows the Environment and Social regulations of Government of Maharashtra and the safeguard policies of the World Bank. The table below presents the Social Management Framework for sub components proposed under SMART, based on the above criteria.

**Table 47: Social Management Framework**

| Project Component / Sub-component                                                                                                                                                                                                                                           | Anticipated social impact                                                                                                                                                                                                                                                                                                                                                                   | Impact categorization                                                                                       | Measures incorporated in project design                                                                                                                                                                                                                       | Mitigation measures suggested                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Implementation schedule                                                               | Responsible                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|----------------------------|
| Component A:<br>Enhancing Institutional Capacity to Support Agricultural Transformation                                                                                                                                                                                     | <ul style="list-style-type: none"> <li>● Institutionalisation</li> <li>● Enhanced mechanism to promote sector by complying with the States' and Bank's policies</li> <li>● Streamlined M&amp;E will result in easy analysis of project impacts</li> <li>● Sharing of international good practices and regular capacity building through explained capacity building institutions</li> </ul> | <ul style="list-style-type: none"> <li>● Positive</li> <li>● Long term</li> </ul>                           | <ul style="list-style-type: none"> <li>● Project commits to comply with the strategy document to build capacities and necessary skill-sets.</li> <li>● Project commits to comply with the State's and Bank's safeguard policies</li> </ul>                    | <ul style="list-style-type: none"> <li>● To appoint safeguard specialist for the entire period of project.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Planning and Implementation                                                           | PCMU                       |
| Component B: Expanding Market Access and Supporting Enterprise Growth<br>Market Access Support. (PP, MAP and Innovations)<br><br>Priority Sector Investments in Infrastructure- SMART Cotton, Exports Facility and Livestock Services<br><br>Capacity Building Support Sub- | Land requirement for any of the commodity could affect the livelihood of the land users.                                                                                                                                                                                                                                                                                                    | <ul style="list-style-type: none"> <li>● Minor</li> <li>● Local</li> <li>● Short term/ Long term</li> </ul> | The project does not involve any land acquisition and Physical displacement for any community. Where public land is involved, the project will get the land encumbrance free. If, however, any land is required, it would be procured through direct purchase | <ul style="list-style-type: none"> <li>● The project will not finance any PP that entails land acquisition.</li> <li>● The project will not finance any direct purchase of land.</li> <li>● The PIU through the CBO must provide evidence that any land required and available with it, is free of any encumbrances.</li> <li>● In case there is direct purchase of land by CBO, such sale deed will be based on prevailing market rates and verifiable.</li> <li>● The SPCMU as a part of monitoring will ensure that the land being made available for the sub project implementation is encumbrance free.</li> <li>● In case of civil works, labour management plan will be prepared and followed as per the Bank requirements.</li> </ul> | <ul style="list-style-type: none"> <li>● Planning and Implementation phase</li> </ul> | PCMU , PIU & Regional team |

| Project Component / Sub-component                                     | Anticipated social impact                                                                                                                                                                                                                                              | Impact categorization                                                                                                  | Measures incorporated in project design                                                         | Mitigation measures suggested                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Implementation schedule           | Responsible               |
|-----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------|
| Component B: Expanding Market Access and Supporting Enterprise Growth | Increased income opportunity for CBO producers will also encourage more people to join CBOs; improved income source Increasing the opportunities for market linkages and income sources by networking / linkages with existing and new markets through Private Players | <ul style="list-style-type: none"> <li>● Moderate</li> <li>● Positive</li> <li>● Long Term</li> </ul>                  | An increase in the linkages to the organised markets will increase the income of the producers. | <ul style="list-style-type: none"> <li>● Producers could be provided guidance on how to invest in activities resulting in increase in income and avail services like insurance etc.</li> <li>● The SC/ST and HHs and other vulnerable population could be identified for specific training related to forming saving groups. The usage of the income earned from project to further strengthen resource base as well as to be diversify the income source could be taken up.</li> </ul>                                                                                                                                                                                                                                                                                                                                                           | Implementation                    | PCMU / PIU /Regional team |
| Component B: Expanding Market Access and Supporting Enterprise Growth | Increased empowerment Women                                                                                                                                                                                                                                            | <ul style="list-style-type: none"> <li>● Major</li> <li>● Positive</li> <li>● Long Term</li> <li>● Regional</li> </ul> |                                                                                                 | <ul style="list-style-type: none"> <li>● To ensure that women participation is increased under the project, following measures could be taken for the enhancement of the impact:</li> <li>● Number of women accessing project services and benefits would be recorded with the objective that this upward trend through the project implementation.</li> <li>● Women's active participation in CBOs and in boards to be monitored. Issues seen as constraints and obstacles to be removed by the PIU through consultations with them and other CBO members.</li> <li>● Participation of women in training programmes to be ensured through appropriate design, location and timing choices to suit their requirements</li> <li>● The training and IEC programmes to focus on the latest market trends to meet the market demand, using</li> </ul> | Planning and Implementation phase | PCMU / PIU /Regional team |

| Project Component / Sub-component                                     | Anticipated social impact                                                                                                                                                                                        | Impact categorization                                                                                                  | Measures incorporated in project design                                                                                                  | Mitigation measures suggested                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Implementation schedule             | Responsible               |
|-----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|---------------------------|
|                                                                       |                                                                                                                                                                                                                  |                                                                                                                        |                                                                                                                                          | <p>local language and technology widely understood, so that they make informed choices.</p> <ul style="list-style-type: none"> <li>● Proposed training programmes to include gender sensitisation of producers and board members to reduce incidence of discrimination and harassment that women face while participating.</li> <li>● The training programmes to include information and details on ensuring fair and transparent community procurement, payment process and maintenance of infrastructure created.</li> <li>● Equal access to women and other poor /vulnerable groups to avail of employment opportunities generated through PP, MAP and Enterprise.</li> <li>● Guidelines to address the social component (including Gender) will be developed in course of the project implementation based on the lessons learnt</li> </ul> |                                     |                           |
| Component B: Expanding Market Access and Supporting Enterprise Growth | Increased Empowerment and reduction in vulnerability of the small & marginal farmers, esp. SC/ST & WHH HHs with increased income opportunities through engagement project activities for livelihood development. | <ul style="list-style-type: none"> <li>● Minor</li> <li>● Positive</li> <li>● Regional</li> <li>● Long Term</li> </ul> | The project design provides for inclusion and equal opportunities for small & marginal farmers including SC/ST & women headed households | <ul style="list-style-type: none"> <li>● To ensure that vulnerable have equal access to project benefits under the project, following measures are suggested:</li> <li>● Customised training programmes will be organised to help SC/ST, &amp; vulnerable farmers. Others to avail benefits under the project.</li> <li>● Ensure adequate representation of SC/ST participants in all the training batches.</li> <li>● Number of SC/ST HHs and other vulnerable population accessing</li> </ul>                                                                                                                                                                                                                                                                                                                                                 | ● Planning and Implementation phase | PCMU / PIU /Regional team |

| Project Component / Sub-component                                     | Anticipated social impact                                                                                                                         | Impact categorization                                                                                                            | Measures incorporated in project design   | Mitigation measures suggested                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Implementation schedule                                                               | Responsible               |
|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------|
|                                                                       |                                                                                                                                                   |                                                                                                                                  |                                           | <p>project services and benefits be recorded with the objective that this participation level should show an upward trend through the project implementation.</p> <ul style="list-style-type: none"> <li>● The project will develop a database on the membership and representation of women, SC / ST and other vulnerable groups in the CBOs.</li> <li>● The project will monitor the participation of SC/ST HHs and other vulnerable population participation in CBOs and boards.</li> <li>● Specific IEC will be planned and implemented to raise the general awareness on agriculture and allied sector and improved practices.</li> <li>● The training programmes to include information and details on ensuring fair and transparent village level procurement and payment process.</li> </ul> |                                                                                       |                           |
| Component B: Expanding Market Access and Supporting Enterprise Growth | Reduced migration in communities where lack of supplemental income sources during non-agricultural seasons forces households to migrate for work. | <ul style="list-style-type: none"> <li>● Minor</li> <li>● Positive</li> <li>● Long term</li> <li>● Regional and Local</li> </ul> | Established linkages to organised markets | <ul style="list-style-type: none"> <li>● To maximise this impact following action could be taken:</li> <li>● Database of migratory farmers (seasonal) with reasons</li> <li>● Awareness programmes for market linkages or bank linkage programme either directly or through coverage under existing scheme.</li> <li>● Induction training programme for the new CBO members</li> <li>● In a sample village, where migration is routine, track through focussed socioeconomic surveys the impact of the programme, with reduced migration as one indicator.</li> </ul>                                                                                                                                                                                                                                | <ul style="list-style-type: none"> <li>● Planning and Implementation phase</li> </ul> | PCMU / PIU /Regional team |

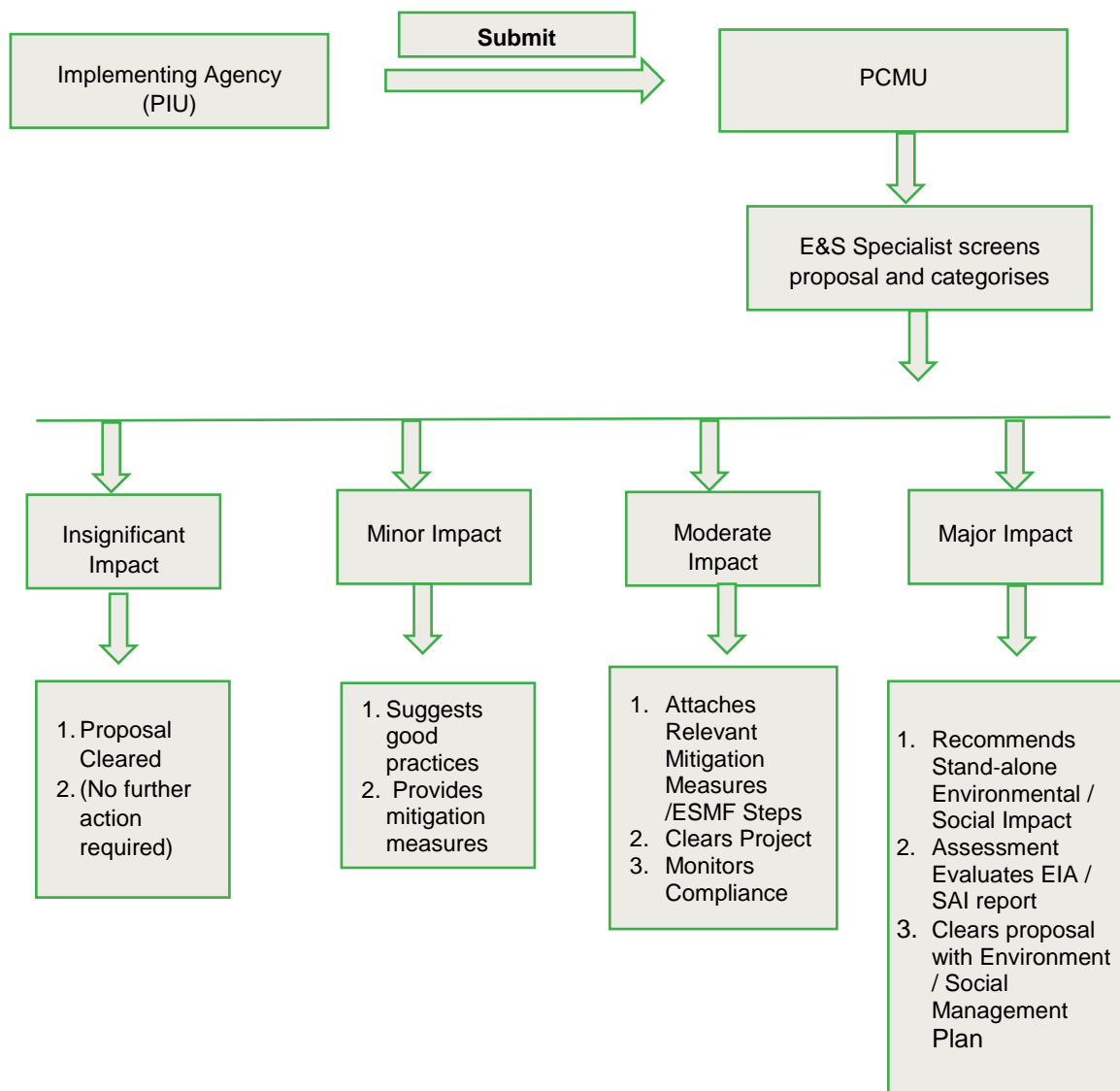
| Project Component / Sub-component                                     | Anticipated social impact                                                                                                                                    | Impact categorization                                                                                             | Measures incorporated in project design                                                                                                                                                      | Mitigation measures suggested                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Implementation schedule           | Responsible               |
|-----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------|
| Component B: Expanding Market Access and Supporting Enterprise Growth | Mismatch between the resource availability and the type of produce, could add pressure on the resources available with landless, marginal and small farmers. | <ul style="list-style-type: none"> <li>Moderate</li> <li>Negative</li> <li>Regional</li> <li>Long term</li> </ul> | <ul style="list-style-type: none"> <li>Demand supply analysis</li> </ul>                                                                                                                     | <ul style="list-style-type: none"> <li>The CBO in their proposal should have measure they will adopt to ensure that their proposed activities have taken into consideration existing resources constraints.</li> <li>CBOs / farmers to be made aware of good post-harvest management practices.</li> <li>IEC will include focus on the most effective and affordable post-harvest practices</li> <li>Improved awareness on safe &amp; cost-effective storage management practices</li> </ul> | Planning and Implementation       | PCMU / PIU /Regional team |
| Component B: Expanding Market Access and Supporting Enterprise Growth | Increased debt of CBOs / farmers due to poor / inadequate repaying capacity                                                                                  | <ul style="list-style-type: none"> <li>Major</li> <li>Negative</li> <li>Short term</li> <li>Regional</li> </ul>   | Linkages with the Banks (financial institutions)                                                                                                                                             | <ul style="list-style-type: none"> <li>Gender sensitive training of the FIs</li> <li>Training of the CBOs on terms of payments / loans</li> <li>Specific training for women-led CBOs</li> </ul>                                                                                                                                                                                                                                                                                              | Planning and Implementation phase | PCMU / PIU /Regional team |
| Component C – Building Risk Mitigation Mechanism                      | Incorrect information can increase distress and burden of the farmers                                                                                        | <ul style="list-style-type: none"> <li>Major</li> <li>Negative</li> <li>Long term</li> <li>Regional</li> </ul>    | Marketing intelligence cell for wider information dissemination among CBOs / farmers                                                                                                         | <ul style="list-style-type: none"> <li>Information is shared with small &amp; marginal and other vulnerable farmers, including women-led CBOs</li> <li>Content / input data validation mechanism</li> <li>Capacity building on usage and application.</li> <li>Sharing of the analysis with concerned stakeholders.</li> </ul>                                                                                                                                                               | Planning and Implementation phase | PCMU / PIU /Regional team |
| Component C – Building Risk Mitigation Mechanism                      | Land requirement for warehouse could affect livelihood, housing, access to livelihood / housing                                                              | <ul style="list-style-type: none"> <li>Minor</li> <li>Local</li> <li>Short term/ Long term</li> </ul>             | <ul style="list-style-type: none"> <li>The project does not involve any land acquisition and Physical displacement for any community for construction / renovation of warehouses.</li> </ul> | <ul style="list-style-type: none"> <li>The project will not finance any warehouse that entails land acquisition.</li> <li>The project will not finance any direct purchase of land.</li> <li>The PIU through the CBO must provide evidence that any land</li> </ul>                                                                                                                                                                                                                          | Planning and Implementation phase | PCMU / PIU /Regional team |

| Project Component / Sub-component | Anticipated social impact | Impact categorization | Measures incorporated in project design                                                                                                                                                                                                                                                                                    | Mitigation measures suggested                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Implementation schedule | Responsible |
|-----------------------------------|---------------------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------|
|                                   |                           |                       | <ul style="list-style-type: none"> <li>● In most cases, the refurbishment would take place on the existing land.</li> <li>● Where public /private land is involved, the project will get the land encumbrance free.</li> <li>● If, however, any land is required, it would be procured through direct purchase.</li> </ul> | <ul style="list-style-type: none"> <li>● required and available with it, is free of any encumbrances.</li> <li>● In case there is direct purchase of land by CBO, such sale deed will be based on prevailing market rates and verifiable.</li> <li>● The PCMU as a part of monitoring will ensure that the land being made available for the warehouse construction / refurbishment is encumbrance free.</li> <li>● In case of civil works, labour management plan will be prepared and followed as per the Bank requirements. Labour Management Framework is detailed in Chapter 15 of this report</li> </ul> |                         |             |

## 6.6 Process flow for the implementation of ESMF

All the proposed investments under the project will follow the following process for the implementation of ESMF as shown in figure below:

Figure 16: ESMF Process Flow Chart for Proposed Investments



In case the proposed project falls under the category having major impact, the implementing agency will be required to conduct separate Environmental Impact Assessment (EIA) / Social Impact Assessment (SIA). Preparation of ESAP, ESMP, RAP, IPP, and Pest Management Plan, etc. will be sub-project (PP/ MAP) specific depending upon the key risks and impacts. Details on preparation of RAP / IPP are given in the subsequent section.

## 6.7 Social Management Framework

The social management framework (SMF) is a road map to be adopted by the Project for incorporation of social development principles into the main project planning, execution and operation. It details the methodology for activities to be carried out under the project and its components. The SMF incorporates key issues pertaining to the screening criteria, gender equity, tribal development, capacity building and monitoring and evaluation.

The SMF would guide the SMART project in undertaking impact assessments and preparing management plans for works under the project while ensuring sensitivity to social and cultural concerns. The SMF shall facilitate implementation of SMART activities in compliance with social development principles of the World Bank.

The SMF shall facilitate the project implementing agencies / departments in identifying sites with no potential adverse social impacts for undertaking activities where land is required and identifying training needs and master trainers for capacity building on social development. The officials of implementing agencies / departments will be provided training on SMF implementation to facilitate achieving social development outcomes of SMART.

The SMF should be discussed with the concerned stakeholder's and details (summary, and /or full document) should be disclosed (in local languages) at project's website, implementing agencies' (PIU) website and appropriate locations at the field level (CBO offices, Gram Panchayat office, etc.). The definition of terms to be used in the RAP is presented in **Appendix H**.

### 6.7.1 Land Requirement

Land requirement is one amongst the guiding principles of social assessment envisaged under SMART as for a particular sub-project implementation it entails number of safeguards issues with respect to resettlement and rehabilitation. As reported by the SMART PCMU, the project is intended to undertake sub-project activities only on the land resource already available with Government departments /agencies or are within the existing Right of Way (RoW) or made available through community contributions /voluntary land donation. As a matter of principle, activities that require land acquisition will not be taken up under SMART (except voluntary land donation for community assets through appropriate processes). This Chapter discusses mechanisms and processes for obtaining land, if required and entitlements for project affected families.

### 6.7.2 Resettlement Framework

The civil work under the project could involve construction of warehouses / aggregation units, cold-storage units, renovation / construction of slaughter houses, and cattle sheds, etc. The extent of resettlement is expected to be minimal. Though minimal, the mitigation of the social and resettlement impacts in the project requires a framework for addressing the impacts in the individual project phases related to resettlement. This Resettlement Framework (RF), which consists of resettlement planning and entitlement provisions, has been worked out based on assessment of the current conditions in the project districts. This RF outlines the principles and approaches to be followed in minimizing and mitigating the adverse social and economic impacts due to the project (details on entitlement matrix in the section below).

#### 1.3.1.15 Purpose of Resettlement Policy Framework

Resettlement Policy Framework (RPF) has been formulated based on the applicable and relevant laws relating to the project and based on the Bank OP 4.12 on involuntary resettlement. The objective of RPF is to avoid if possible, if not minimize impacts and finally mitigate the adverse

social impacts on the population affected by the planning, design and implementation of the project. The framework emphasizes that the involuntary resettlement will be avoided and minimized by exploring different design options, if feasible. In other words, exploring various options and considering the best option which has minimum or no impact.

The nature and magnitude of social impact will be assessed through social impact assessments. A Resettlement Action Plan (RAP) or Abbreviated Resettlement Action Plan (ARAP), as applicable will be prepared in compliance with the Social Safeguards provided in the ESMF and implemented to mitigate the adverse impacts to assist the affected people and to enable them to improve their living standards. The measures available in the RAP /ARAP shall be implemented prior to the commencement of civil works. All the Bank-approved social safeguard documents (RAP, ARAP, IPDP, etc.) will be disclosed 120 days prior to the start of the construction.

The broad categories of economic and social adverse impacts that would be mitigated are:

- Loss of land and assets
- Loss of shelter or homestead lands
- Loss of income or means of livelihood
- Loss of access to productive resources, shelter/residences
- Loss of collective impacts on groups such as loss of community assets, common property resources and others.

### 6.7.3 Social Management (Resettlement and Rehabilitation)

The principal objectives of this R&R Policy are to:

- Minimize displacement and to identify the non-displacing or least-displacing alternatives
- Explore different alternatives /options to avoid physical displacement and involuntary relocations (such as alternative sites, wherever possible etc.)
- Plan the Resettlement and Rehabilitation of Project Affected Families (PAFs), including special needs of vulnerable sections;
- Compensate and assistance to the Project Affected People (PAPs) irrespective of their legal rights, in maintaining /restoring their former living standards, income earning capacity, and production levels.
- Carry out detailed planning along with implementation arrangements, in case PAPs lose land /structures and or displaced and or economically affected adversely
- Facilitate harmonious relationship between the Implementing Authority (Acquiring Body) and PAFs through cooperation and regular interaction;
- Ensure that the affected persons are meaningfully consulted and provided opportunities to participate in the planning and implementation stages of the resettlement program in order to suitably accommodate their inputs and make this policy more participatory in nature and broad based in its scope.

#### 1.3.1.16 Resettlement and Rehabilitation Principles

- The Resettlement and Rehabilitation policy is based on the principle that the affected persons are not worse-off on account of the project than they were before. This approach to frame the R&R Policy ensures greater acceptability of the project to the people and is expected to facilitate its effective implementation.
- PAP /PAF will be categorized as titleholders and non-titleholders. The vulnerable sections among each of the above categories will receive additional support.

- The negative impact on persons affected by the project would be avoided or minimized.
- Where the negative impacts are unavoidable, the project-affected persons will be assisted in regaining their standard of living. Vulnerable Groups will be identified and assisted to improve their standard of living.
- All information related to resettlement preparation and implementation will be disclosed to all concerned (in a language /format understood by the affected), and people's participation will be ensured in planning and implementing the project.
- The PAPs will receive compensation for lost assets at replacement cost and the compensation will be available prior to the taking over of assets.
- Broad entitlement framework of different categories of PAP has been assessed and is given in the entitlement matrix. PAFs will be surveyed / enumerated as of the cut – off date. Provisions will be kept in the budget for those who were not present at the time of enumeration. However, anyone moving into the project area after the cut-off date will not be entitled to assistance.
- Appropriate grievance Redressal mechanism will be established at the district level to ensure speedy resolution of disputes.
- All consultations with PAPs shall be documented. Consultations will continue during the implementation of resettlement and rehabilitation works.

#### 6.7.4 Social Regulatory Framework

The Subprojects that would be financed under SMART needs to be consistent and complied with and meet the requirements of the following applicable acts, notifications, and policies. The compensation and assistance provided to the project affected will be based on the applicable acts, legislations, regulations besides the Operational Policies of the World Bank.

##### National and State

- The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act 2013.
- Right to Information Act, 2005
- The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement (Maharashtra), Rules, 2014

##### Operational Policies of the World Bank

- OP/BP 4.10 Indigenous People
- OP/BP 4.12 Involuntary Resettlement

#### 6.7.5 Categorization of sub-projects

During the screening process, the social risks will be assessed through the screening formats submitted by the borrower along with the loan application. Screening formats are given in **Appendix I**. Based on the screening, the social category of the project is determined and necessary SIA and related RAP/ ARAP as applicable shall be prepared. Based on the magnitude of impact to the Project Affected Persons (PAPs) through screening of projects, projects have been categorized as either Sa, Sb or Sc outlined in Table below:

**Table 48: Categorization of sub-projects: Social**

| Category  | Description                                      |                                        | Type of project                                                                                                                                                                                                                      |
|-----------|--------------------------------------------------|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | Level of issues                                  | Management measures                    |                                                                                                                                                                                                                                      |
| <b>Sa</b> | Significant adverse impacts expected             | Social Impact Assessment (SIA) and RAP | <ul style="list-style-type: none"> <li>● If it involves acquisition of private land or permanent loss of private assets and livelihood</li> <li>● If it involves physical displacement of 200 and more PAPs are affected.</li> </ul> |
| <b>Sb</b> | Moderate adverse social impacts expected         | SIA and Abbreviated RAP                | <ul style="list-style-type: none"> <li>● If the affected people are not physically displaced and less than 10 percent of their productive is lost;</li> <li>● If fewer than 200 people are displaced</li> </ul>                      |
| <b>Sc</b> | No social issues expected hence, Socially benign | Social Screening Report                | <ul style="list-style-type: none"> <li>● No private land acquisition or no impacts to PAPs</li> <li>● Construction stage impacts on assets near right of way</li> </ul>                                                              |

The social categorization will be done based on the social screening information provided by the CBOs/ field staff. However, based on the outcome of social impact assessment, the category will be revisited at the time of appraisal of each subproject.

### 6.7.6 Social Impact Assessment and Resettlement Action Plan

A social impact assessment will be undertaken for all projects with high to moderate social impacts to assess the potential social impacts of the proposed projects. Based on the outcome of such assessment the corresponding mitigation instrument -- Abbreviated Resettlement Action Plan (ARAP) will be prepared for Sb Category Projects and Full Resettlement Action Plan (FRAP) will be prepared for Sa category projects. SIA process includes undertaking of the following steps:

- consultations with the stakeholders
- census survey of PAPs
- socio-economic surveys of the Project Affected Persons
- focus group discussion with specific interest groups

In case the baseline socio-economic survey data is more than two (2) years old at the time of implementation of the project, the key socio-economic data will be updated.

**Contents of the Resettlement Action Plan (RAP) shall include the following as a basic minimum:**

- Executive Summary
- Project description
- Objectives and Study Methodology
- Socio-Economic Profile of the project area
- Regulatory Policies with respect to Social Safeguards
- Proposed Improvements under the project
- Options considered for minimizing adverse impacts
- Assessment of Project impacts
- Baselines Socio Economic Survey
- Public Consultation & Disclosure and Plan
- Nature and magnitude of impacts
- Type of impacts

- Compensation and R&R assistance
- Livelihood Restoration and Income Generation Plan
- Gender Dimensions and Action Plan
- Grievance Redress Mechanism
- Implementation Schedule and Budget
- Institutional Arrangements
- Implementation Arrangements
- Monitoring and Evaluation

#### 1.3.1.17 Abbreviated Resettlement Action Plans (ARAPs)

ARAP will be prepared where impacts on the entire displaced population are minor and less than 200 persons are affected; an ARAP would be prepared covering the following minimum elements:

- A census survey of displaced persons and valuation of assets
- Description of compensation and other resettlement assistance to be provided
- Consultations with displaced people about acceptable alternatives
- Institutional responsibility for implementation and procedures for grievance redress
- Arrangements for monitoring and implementation
- A timetable and budget.

The SIA/RAP will be disclosed followed by a consultation and the suggestions, comments of the stakeholders will be incorporated in the RAP. The final RAP will be disclosed on the websites of the implementing agencies and related CBOs. The Hindi / vernacular version of full report will also be disclosed in the project sites.

### 6.7.7 Resettlement planning

The various tasks related to resettlement planning are specified below:

#### 1.3.1.18 Dissemination of selected sites:

Salient features of the finalized sites /locations will be displayed at the notice boards of the District Panchayat and the concerned Gram Panchayat. This shall include (a) map of the district / block showing the sites to be covered; and (b) list of villages to be benefited.

#### 1.3.1.19 Selection of sites

The selection of sites for new construction /upgradation shall be based on consultation with the concerned CBOs /stakeholders, and community that may be directly or indirectly affected. The following criteria shall be adopted as pre-requisites for taking up sites by the State Governments:

- The proposed investment /alignment involves little or no loss of land or structures, and the remaining land and /or structures remain viable for continued use;
- In the event of impacts not being avoidable, there is a scope for obliterating, reducing, and /or supporting losses through one or more of the following mechanisms<sup>10</sup>:
  - i. Design modifications by reduction of the land width, alignment shifts, modifications in cross-sections etc., to the extent required from safety considerations,

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<sup>10</sup> Sites where no scope exists for addressing the social impacts through any of the mechanisms shall not be taken up for SMART during that particular year. Such sites will be taken up after these issues are resolved by the community and there is a demand for the construction to the PCMU

- ii. Voluntary land donation by the land owner through a written Memorandum of Understanding /Affidavit and/ or land acquisition through LA Act /or direct purchase, and,
- iii. Civil society support mechanism (PRI /Community) to the vulnerable affected persons.

#### 1.3.1.20 Dissemination of Project Information

After selection of sites and prior to finalization of the type of investments, a brochure providing an overview of the project in the state will be available for distribution in each of the Gram Panchayat /concerned PIU along the proposed site. The dissemination of information shall

- sensitize the communities on the project related issues
- demonstrate the expectations of the project from the communities, including mechanisms for beneficiary role, if any.

#### 1.3.1.21 Consultations with the Affected Persons

Within a week of selection of sites, the concerned PIU / Gram Panchayat (GP) shall organise a meeting involving the affected persons to communicate how the concerns of the communities have / have not been incorporated into the project design. The affected persons would be consulted at least twice: once while planning and then to explain the contents of plans when these are finalised (the structure and format for recording the consultation sessions are presented in **Appendix J**). In addition, consultation would take place throughout the implementation of the Resettlement Action Plan. The methods of consultation would include group consultations with male as well female affected persons, individual consultations with PAFs, community leaders, elected representatives of Panchayat /Local Bodies and other stakeholders who may be deemed suitable for consultation. Details will also be published in the press and electronic media. The following information pertaining to the project design will be highlighted and disseminated:

- Specifications, project costs and construction schedule,
- Likely issues due to project activities,
- Land width required and available,
- Design modifications incorporating comments and suggestions of communities
- Procedure to be adopted for accretion of land / assets (MoU /Affidavit),
- Entitlement provisions for vulnerable groups,
- Disbursal Procedures to Entitled Persons,
- Safety and health concerns during construction works, and
- Inputs required by the local community as construction labour, temporary use of land for diversions etc.

#### 1.3.1.22 Profile of Affected Persons

In order to carry out resettlement planning, implementation and monitoring, it is important to collect baseline socio-economic data of PAPs. For this purpose, census and socio-economic surveys shall be conducted using questionnaire prepared by the Detail Project Report consultant (**Appendix K**). It gives a questionnaire for census survey of PAP. As far as possible, these surveys shall be completed prior to the issuance of Notification under section 3 of the Land Acquisition Act, 2013 to ensure better quality & authenticity of data. Broad information that would be collected during these surveys relate to details of family members, religion, caste, sources of income, occupation, land holdings, ownership and type of structures, other property and assets owned, livestock size, details of losses of assets to the project, etc. These surveys shall be designed to ensure that only genuine persons are classified as project affected and the scope for

frauds /misrepresentations and opportunistic attempts to seek assistance is negated. The extent of impact on Common Property Resources shall also be covered during these surveys. In addition, individuals and group consultations would be carried out to understand the needs and concerns of PAPs about various issues such as compensation, assistance, resettlement options, alternative options, value addition to the project etc.

The census shall enable the identification of vulnerable PAPs, and families that would be suitably identified as titleholders and non-titleholders. The socio-economic conditions of PAP and type and extent of impact would be worked out in order to prepare the Resettlement Action Plan. The RAP would broadly include project description, methodology adopted, minimization of adverse impacts, impact assessment, socio-economic profile of the area, R&R Policy provisions, legal framework and land required for various purposes of the project, consultations during the implementation, institutional arrangements, implementation schedule, estimated budget for RAP as well as monitoring and evaluation arrangements, disclosure etc.

#### 1.3.1.23 Identification of vulnerable PAPs

The project provides for targeted support / assistance to the vulnerable groups. The vulnerability shall be assessed by the PCMU based on the census of the affected persons. The following categories of Project Affected Persons shall be entitled for support as vulnerable groups:

- BPL households (with a valid proof), as per the State poverty line for rural areas;
- BPL households without a proof of the same and belonging to the following social categories:
  - Women headed households with women as sole earner
  - Scheduled Caste/Scheduled Tribe and
  - Physically Challenged person, and is subject to any of the following impacts;
    - Loses more than 10 percent of the total land holding<sup>11</sup>;
    - Loses shelter; and
    - Loses source of livelihood.

#### 1.3.1.24 Integrating R&R issues in Detailed Project Report (DPR)

To ensure that the designs for the project are sensitive to social issues and have incorporated the social considerations, the following information shall be documented as part of the DPR prior to submission for approval:

- Proceedings of the formal consultation (meeting) with the communities,
- Census questionnaires of the PAPs, and
- List of Entitled Persons who will be eligible for support.

#### 1.3.1.25 Dissemination of process of land transfer

The process to be adopted for land transfer will include dissemination of project details such as details of the sites, cost, likely construction schedule, list of PAPs along with entitlements and entitled persons shall be disseminated. The information would be disseminated through posters, pamphlets displayed at the Gram Panchayat office or other prominent places such as school, shop, Chaupal, primary health centre etc.

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<sup>11</sup> The total land holding includes any other land parcels owned elsewhere by the PAP

## 6.8 Mechanisms for Obtaining Land for Project Activities

### 6.8.1 Land Donation

In districts where land donation is the approach for land availability, the following procedure and principles shall be applied.

Due diligence shall be carried out to ascertain category of the land, name of the actual land owner as per land records, obtain proof of the ownership and ensure that land donated for the project is not more than 10 percent of total land owned by the donor or the residual land is viable. The process and screening mechanism for the same have been detailed out in section on SMF.

- A Civil Society support mechanism (PRI /Community /CBO /FPO) will assist the affected households in transferring land and ensuring that entitlements are received as agreed during the process.
- The willingness of the land owner for transfer of land through donation shall be assessed during consultations and if required, supports through PRI and community shall be taken to explain the advantages and disadvantages of the proposed project intervention, particularly among women and other vulnerable population.
- The land donation process will be adopted as per the procedures laid down in the R&R Policy of the State. The steps to be followed for land donation process shall be:
  - i. Disseminate the important project information to the community;
  - ii. Conduct transect walk along with the representatives from the community, revenue department, CBOs /FPOs to identify the locations requiring additional land, land owners, assets likely to be impacted;
  - iii. Conduct survey of the affected households identified during transect walk using the format provided at **Appendix K**
  - iv. Conduct consultation with the affected households and explain the land donation procedure;
  - v. Execute Memorandum of Understanding (MoU) with the affected households as per the format provided in **Appendix L**
  - vi. Ensure that commencement of civil works in the donated land starts only after the MoU is signed and registration is complete
  - vii. Maintain records on land donation including the agreement with donors.
  - viii. Ensure no coercion to elicit land donation and the District team / PIU will be responsible to verify and ensure that there is no force donation.

### 6.8.2 Lease /Rent of Land Parcels

In case, there is a requirement of land /property /building to be taken on lease /rental basis, a rental deed shall be executed on a stamp paper between land owner and concerned stakeholder as per the specifications of the Maharashtra state land rules.

### 6.8.3 Government Land

The procedure for inter departmental transfer of land should be followed through the concerned PIUs. The land alienation proposal will be initiated by the Deputy Commissioner based on the land requisition proposal. A certificate from the circle officer of the concerned revenue circle with details of the land (Patta no. etc.) should be obtained along with the proposal for all the sub-projects submitted under SMART by the PIUs /DIUs. A due diligence exercise shall be carried out to ascertain presence of any squatter or encroacher in the required land area for each sub-project site initiation of activity. The process for obtaining government land shall be as follows:

- Screening of the land ownership status: The PIU /DIU shall undertake a screening exercise to confirm the land ownership and utilisation status (refer screening checklist for land utilisation).
- Certification of Land ownership documents from the office of the respective divisional Sub-registrar of lands and Map of the land.
- Confirmation of encumbrance free status of the land as part of the check list.
- In case of involuntary displacement due to the project, the census survey of affected households shall be carried out (refer **Appendix K**).
- In case of any involuntary resettlement due to the proposed project, assistance shall be provided as per the entitlement matrix.

#### 6.8.4 Impact on lands involving traditional and tenurial rights:

The legal provisions at the State level pertaining to the transfer of lands will be followed. The process of land transfer shall consider the existing customary rights of the tribal community on various categories of land. It shall be the responsibility of the PCMU PIU /DIU along with the village level Panchayat members to assess the impact on loss of livelihood and extent of dependence of local community on these lands through consultations.

##### 1.3.1.26 Impacts on Tribal and necessary framework:

The guiding principles enshrined in the constitution of independent India as also various plans and policies safeguard the interests of scheduled tribes. The Gol has, from time to time, issued instructions to the State governments and enacted enabling legislations and amendments to relevant existing laws. These efforts have been made to help the state governments to sensitively deal with ST populations and the problems they are faced on account of development projects. Also, the State governments have been encouraged to pass suitable legislations, wherever possible, to help make necessary legal and administrative arrangements to help the STs in specific situations. There are enough provisions and scope already, in the existing laws to meet the objectives of Environment and Social Management Framework regarding the Scheduled Tribes. However, in order to tie these in with the SMART activities at different project stages, Resettlement Planning exclusive to the tribal community is to be developed. The Resettlement Plan for Tribes must be developed to ensure that there is enough planning and implementation that safeguard the interests of the tribes. This shall take care of the customary systems of decision making and participation in project planning and implementation. This Resettlement Plan of the Tribal community will be applicable in areas inhabited by Scheduled Tribes.

#### 6.8.5 Land Compensation and Entitlements

Wherever Land Acquisition is involved in the projects, compensation for the land and related R&R to the PAPs will be made as per the provisions of the Right to fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (RFCTLARR 2013). The District Administration / concerned authorities will carry out private land acquisition and R&R implementation based on the provisions of RFCTLARR Act, 2013. The project affected assigned land owners will be treated like the project affected land-owners, as per the state's policy on land acquisition.

The need for resettlement and rehabilitation arises when the land which is acquired or alienated or transferred results in involuntary displacement and/or loss of livelihood, sources of income and access to common properties/resources on which people depend for economic, social and cultural needs irrespective of their legal status. Though the squatters and encroachers are not entitled to legal compensation for land that they have occupied, this policy will provide for resettlement and rehabilitation of such persons with the aim of improving their standard of living. This policy will also be applicable to those landowners from whom land would be acquired. In

case of those affected families living in the lands reserved under Development Plans with or without approval of construction of structures will also be assisted for resettlement and rehabilitation as per the Entitlement Framework in this RF.

#### 1.3.1.27 Use of Government Lands

Very often, the lands belonging to other land-owning departments are required to be used for various facilities to be proposed. Generally, necessary permissions and approvals for land alienation take a long time. In case of all Government lands, obtaining “Enter only upon Permission” from land owning agencies or other authorities concerned, prior to contract award is a pre-requisite and the land alienation or conditions for the same must be completed as soon as possible and prior to commencement of construction in those respective facilities / sites.

The entitlement for different categories of impacts is explained in the following entitlement matrix. The principles of the entitlement matrix are in accordance with the RFCTLARR, 2013 and the Safeguards on Involuntary Resettlement (OP 4.12) and Indigenous People (OP 4.10) of World Bank. An entitlement matrix provides the entitlements for different impact categories in the following order. Definition forming the basis for entitlement matrix is placed at **Appendix H**.

Impact to title holders which covers:

- Loss of Land
- Loss of Residential Structures
- Loss of commercial structures
- Impact to tenants and leaseholders a. residential b. commercial
- Impacts to non-title holders
- Residential squatters
- Commercial squatters
- Encroachers
- Impacts to trees, plants and standing crops
- Loss of Livelihoods
- Employers in shops, agricultural labourer’s, sharecroppers etc.,
- Impacts to Vulnerable Households
- Impacts to Community Assets
- Temporary impacts
- Unidentified impacts

#### 1.3.1.28 Entitlement for Project Affected Persons (PAPs)

The entitlement for different categories of impacts is explained in the following entitlement matrix. The principles of the entitlement matrix are in accordance with the RTFCTLARR, and World Bank’s Operational Policy (OP) 4.12 on Land Acquisition. The entitlement matrix presents the entitlements for different impact categories in the following order:

- Impact to title holders which covers
  - i. Loss of Land
  - ii. Loss of Residential Structures
  - iii. Loss of commercial structures
  - iv. Impact to tenants and leaseholders

- v. Residential
- vi. Commercial
- vii. Impacts to trees, plants and standing crops
- viii. Impacts to non-title holders
- ix. Loss of Livelihoods (Permanent loss and Temporary disruption to income)
- x. Employers in shops, agricultural labourer, sharecroppers etc.,
- xi. Impacts to Vulnerable Households
- xii. Impacts to Community Assets
- xiii. Unidentified impacts

#### **6.8.6 Entitlement Framework**

The Entitlement Framework given in table below is adapted based on the present version of the RFCTLARR, 2013. In any case on a project to project basis, specific considerations based on local conditions, status of affected people etc. the entitlement framework will be customized.

Table 49: Entitlement Matrix

| Code | Category of PAP                                                     | Type of Impact                  | Unit of Entitlement              | Entitlement                                                                                                                                                                                                                                                                                                                                                                                                                  | Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------|---------------------------------------------------------------------|---------------------------------|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Impacts to Title holders (Loss of Private Properties)               |                                 |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| A    | Agriculture Land / Non-agriculture land / Homestead Land and assets | Loss of land and assets         | Land Owner                       | <ul style="list-style-type: none"> <li>• Compensation as per RFCTLARR Act, 2013 criteria provided in paragraph 26 of the Act</li> <li>• One-time grant not exceeding Rs. 5,00,000/- for each affected household or annuity policy that shall pay Rs.2000/- per month for 20 years with appropriate indexation to Consumer Price indexation</li> <li>• Right to salvage materials from affected land or structure.</li> </ul> | <p>Higher of</p> <ul style="list-style-type: none"> <li>– market value as per India Stamp Act, 1899 for the registration of sale deed or agreements or</li> <li>– average sale price for similar land ascertained from the highest 50 percent of sale deeds of the preceding 3 years or</li> <li>– consented amount paid for PPPs or private companies. Plus 100 percent solatium and 12 percent interest from date of notification to award. The multiplied factor adopted by state government for distance from urban area to the affected area will be applied.</li> </ul> <p>In case of impacts to assigned lands, the compensation and other benefits will be provided to affected owners at par with the land owners. The provision of infrastructural amenities will be as per the Third schedule of RTFCTLARR Act 2013, wherever alternative resettlement sites are provided. The provision of purchase or lease as available under RTFCTLARR act, 2013, will be exercised wherever appropriate. The acquiring entity shall consider acquisition of residual land or asset, if it is required.</p> |
| B    | Titleholder – Residential Structure                                 | Loss of Structure (Residential) | Titleholder / structure owner(s) | <ul style="list-style-type: none"> <li>• Cash compensation as per the Market Value of the structure and 100 percent solatium.</li> <li>• Each affected family having cattle will be provided one-time financial assistance of Rs. 25,000</li> <li>• Provision of alternative house as per PMAY or equivalent financial assistance in Urban Areas. Provision of House in case</li> </ul>                                      | The value of houses, buildings and other immovable properties will be determined without depreciation and as per the provisions of RTFCTLARR Act 2013. Stamp duty and registration charges will be borne in case of new houses or sites. Houses in urban                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| Code | Category of PAP                                       | Type of Impact                 | Unit of Entitlement       | Entitlement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Remarks                                                                                                                                                                                                                                                       |
|------|-------------------------------------------------------|--------------------------------|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      |                                                       |                                |                           | <p>of rural area as per IAY specifications or equivalent cost of the house.</p> <ul style="list-style-type: none"> <li>● Transportation cost of Rs. 50,000/-</li> <li>● Right to salvage materials from affected land or structure.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | areas may-be provided in multi-storeyed building complexes.                                                                                                                                                                                                   |
| C    | Titleholder-Commercial                                | Loss of structure (commercial) | Land / structure owner(s) | <ul style="list-style-type: none"> <li>● Cash compensation as per the Market Value of the structure and 100 percent solatium.</li> <li>● One-time grant to artisan, small trader and certain others shall get a one-time financial assistance of Rs. 25,000/-</li> <li>● Transportation cost of Rs. 50,000/-</li> <li>● Right to salvage affected materials</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | The value of commercial structures and other immovable properties will be determined without depreciation and as per Section 29 of RTFCTLARR Act 2013.                                                                                                        |
| D    | Tenants-Residential/ commercial/ industrial Structure | Loss of structure              | Individual / Household    | <p>Residential</p> <ul style="list-style-type: none"> <li>● Each affected family that is displaced due to land acquisition shall be given a monthly subsistence allowance equivalent to Rs. 3000/- per month for a period of one year from the date of award.</li> <li>● One-time financial assistance of Rs. 50,000 as transportation cost for shifting of the family, building materials, belongings and cattle.</li> <li>● Right to salvage affected materials</li> </ul> <p>Commercial</p> <ul style="list-style-type: none"> <li>● One-time financial assistance of Rs. 50,000 as transportation cost for shifting of the family, building materials, belongings and cattle.</li> <li>● One-time grant to artisan, small trader and certain others shall get a one-time financial assistance of Rs. 25,000</li> </ul> <p>Agricultural Tenants</p> <p>In case of agricultural tenant's advance notice to harvest crops or compensation for lost crop at market value of the yield determined by agricultural department.</p> | <p>The affected families eligible for this assistance may be from title holder or non-title holder categories as defined u/s 3 (c) of RFCT-LARR, 2013</p> <p>This will be extended also to the physically challenged persons and women-headed households.</p> |
| E    | Impacts to trees, plants and standing crops           |                                |                           | The Collector for the purpose of determining the value of trees, plants and standing crops attached to the land acquired, use the services of experienced persons in the field of agriculture, forestry, horticulture, sericulture, or any other field, as may be considered necessary by him/her.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | The compensation for the affected trees, plants shall be determined as per Section 29 (2) & (3) of the RTFCTLARR Act 2013.                                                                                                                                    |

| Code | Category of PAP                          | Type of Impact            | Unit of Entitlement    | Entitlement                                                                                                                                                                                                                                                                                                                                                                                                                                | Remarks                                                                                                                                                                                                               |
|------|------------------------------------------|---------------------------|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2    | Impacts to Non-title holders (Squatters) |                           |                        |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                       |
| A    | Non-title holders (Squatters)            | Loss of House             | Individual / Household | <ul style="list-style-type: none"> <li>• Compensation at Market Value for the affected structure OR Alternative house with minimum area as per Government norms</li> <li>• One-time Subsistence grant of Rs. 18,000/-</li> <li>• One-time financial assistance of Rs. 5,000/- as transportation cost for shifting of the family, building materials, belongings and cattle.</li> <li>• Right to salvage the affected materials.</li> </ul> | Houses in urban areas may, if necessary, be provided in multi-storied building / complexes. The Titles for alternatives houses shall be provided in the joint name of the wife and husband preferably, if both exist. |
| B    |                                          | Loss of Shop              |                        | <ul style="list-style-type: none"> <li>• Compensation at Market Value for the affected structure.</li> <li>• One-time financial assistance of Rs. 5,000/- as transportation cost for shifting</li> <li>• One-time grant of Rs. 2500/- for loss of trade/self-employment for the business owner</li> <li>• Right to salvage the affected materials.</li> </ul>                                                                              |                                                                                                                                                                                                                       |
| C    | Encroacher                               | Loss of Assets            | Individual             | <ul style="list-style-type: none"> <li>• Cash compensation for the affected structure as per the Market Value</li> <li>• One-time shifting assistance of Rs. 5000/- for Kiosks</li> <li>• Right to salvage material.</li> </ul>                                                                                                                                                                                                            | The value of commercial structures and other immovable properties will be determined by the Market Value of the encroached structure without depreciation                                                             |
| 3. A | Agricultural Labourer                    | Loss of Income Livelihood | Individual             | Subsistence allowance equivalent monthly minimum agricultural / industrial wages for 3 months                                                                                                                                                                                                                                                                                                                                              | Only agricultural labourer's, who are in fulltime /permanent employment of the land owner or those affected full time employees of the business will be eligible for this assistance                                  |
| B    | Employees in shops, sharecroppers        | Loss of Income Livelihood | Individual             | For temporary disruption of livelihood, minimum wages as per collector rate for the period of disruption (average 3 days)                                                                                                                                                                                                                                                                                                                  | Only to regular vendors or roadside shopkeepers whose income is affected during construction period will be eligible for this assistance.<br>Prior notice before start of construction works.                         |
| 4.   | Impact to Vulnerable Displaced People    |                           | Individual/ Household  | <ul style="list-style-type: none"> <li>• Training for skill development. This assistance includes cost of training and financial assistance for travel/conveyance and food.</li> </ul>                                                                                                                                                                                                                                                     | Training will be provided through relevant training institutions                                                                                                                                                      |

| Code | Category of PAP                                                | Type of Impact                 | Unit of Entitlement | Entitlement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Remarks                                                                                                                                                                                                                                                                                                                                                                                          |
|------|----------------------------------------------------------------|--------------------------------|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      |                                                                |                                |                     | <ul style="list-style-type: none"> <li>One adult member of the affected household, whose livelihood is affected, will be entitled for skill development.</li> <li>Additional assistance for vulnerable households whose livelihood/loss of shelter is impacted by the project will be paid additional one-time assistance of Rs. 5000 in case of non-title holder families.</li> <li>In addition to this amount, the Scheduled Castes and the Scheduled Tribes displaced from Scheduled Areas shall receive an amount equivalent to Rs. 50000/- (as per provisions of RTFCLARR Act 2013)</li> <li>Further SC and ST households shall be provided with relaxation in charges in the water supply/sewerage connections.</li> </ul> | The one-time assistance to the Vulnerable PAFs will be paid to only one type of impact for the multiple vulnerable impacts.                                                                                                                                                                                                                                                                      |
| 5    | Loss of Community Infrastructure and Common Property Resources | Loss of community assets       | Community           | Reconstruction of common structure and common property resources                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | The reconstruction of community structures and replacement of CPR shall be done in consultation with the community.                                                                                                                                                                                                                                                                              |
| 6    | Mitigation of Temporary Impacts on Land and Assets             | Temporary loss of land / asset | Household           | Compensation for temporary impact during construction like disruption of normal traffic, damage to adjacent parcel of land/ assets due to the movement of heavy machinery and plant site.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>The contractor shall bear the compensation cost of any impacts on structure during construction or establishment of construction site.</li> <li>All temporary use of lands outside proposed ROW to be through written approval of the landowner and contractor. Locations of construction camps by contractors in consultation with community.</li> </ul> |
| 7    | Unforeseen impacts                                             |                                |                     | Any unforeseen impacts shall be documented and mitigated in accordance with the principles and objectives of the RTFCLARR ACT.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                  |

## 6.9 Budget Provisions

The Resettlement Action Plan will include an itemized budget and an implementation schedule. Suitable provisions will be made in the Project budget for these purposes.

### 6.9.1 Disclosure of Resettlement Policy and other Project Documents

The Resettlement and Rehabilitation Policy, Resettlement Action Plan and other project related document / relevant information shall be translated in local language and notified through the State Government /PCMU. The list of eligible people for benefit and disbursement of benefits shall be separately disclosed at concerned village Panchayat Office / concerned department (in case of peri-urban/urban areas), to ensure transparency. A copy of the same shall also be put up at notice boards of the Legislative Assembly, District Collector Offices, Block Development Offices, District Public Relations Offices, (at the state and district-levels), Urban Local Bodies, Panchayat Offices etc. In addition, a Public Information Centre will be established at respective PIU as part of the project.

English and vernacular versions of all such documents and list of eligible families for benefits under the project shall also be made available on the SMART PCMU and PIU's website.

### 6.9.2 Scope for Making Amendments.

The PIU with the prior approval of the Government of Maharashtra, may from time to time make amendments in this R&R Policy, as and when considered necessary. Any amendment made in the policy shall be done in consultation with the World Bank and duly publicised.

### 6.9.3 Grievance redress mechanism for R&R

There shall be grievance redress /R&R committees to hear and redress the grievances, if any, of the PAFS & PAPs at field and Head Quarter levels (PCMU). This committee will be a separate committee and will address R&R related issues. The Field level grievance committee (FLC) shall be convened by PCMU, where the District Collector shall be the Chairperson, and other members will be the President, Zilla Parishad (District Council) and a representative from a reputed local NGO. The HQ level grievance committee (HLC), shall be convened by PCMU where the Project Director, Additional Project Director, shall be the member. Arbitrators will be appointed to hear grievance cases relating to payment of compensation for land to be acquired under Land Acquisition Act- 2013. An Ombudsman will be appointed for hearing cases not resolved to the satisfaction of the aggrieved PAP/PAF at the levels mentioned above, including cases directly referred by the PCMU.

## 6.10 Inclusion Strategy

In addition, the inclusion strategy of the SMART would focus on:

1. CBOs from each region of Maharashtra have equal opportunity to participate in the competitive business proposal.
2. Project would maintain the State ration of Small and Marginal farmers and SC & ST farmers.
3. The project would keep minimum 30 percent target for participation of women CBOs out of the total CBOs. Environment Management Framework

Each of the identified environmental attributes were assessed across the agriculture value chain which includes primary farm production, transportation, storage facilities such as warehouse / cold storage and Food Processing industry / Market.

The risks have been categorised as high, moderate, low and no impacts based on the extent of impact and its nature as reversible or irreversible.

The baseline environmental and social impact screening matrix is as indicated in the table below:

**Table 50: Screening of Potential Impacts Due to Agriculture and Allied Activities**

| Environmental Attributes          | Primary Production | Transportation  | Storage         | Processing      | Cumulative      |
|-----------------------------------|--------------------|-----------------|-----------------|-----------------|-----------------|
| Soil Quality                      | √<br>High          | x<br>No Impacts | x<br>No Impacts | √<br>moderate   | √<br>High       |
| Water Quality                     | √<br>High          | x<br>No Impacts | x<br>No Impacts | √<br>high       | √<br>High       |
| Air Quality                       | √<br>moderate      | √<br>High       | √<br>Low        | √<br>moderate   | √<br>Moderate   |
| Noise Quality                     | √<br>Low           | √<br>Low        | x<br>No Impacts | √<br>moderate   | √<br>Moderate   |
| Bio diversity and Natural Habitat | √<br>Moderate      | x<br>No Impacts | x<br>No Impacts | x<br>No Impacts | √<br>Moderate   |
| Farmer Health and Safety          | √<br>Moderate      | √<br>Low        | √<br>Low        | √<br>Low        | √<br>Low        |
| Consumer Health and Safety        | √<br>No impacts    | x<br>No Impacts | √<br>Low        | √<br>Low        | √<br>Low        |
| Cultural Heritage                 | x<br>No Impacts    | x<br>No Impacts | x<br>No Impacts | x<br>No Impacts | x<br>No Impacts |

Source: MM Analysis

Each of the impacts identified during the screening stage are discussed in brief in the impact assessment section.

## 6.10.1 Potential Environmental Impact Assessment in Current Practices

### 6.10.1.1 Soil Quality Impact

Environmental impacts on soil quality identified during the study are as follows:

- Survey reveals that only 45 – 50 percent farmers were having soil health cards. In the absence of knowledge on soil health, there is possibility that farmers intent to use excessive fertilizers. This can result in negative impact on soil quality.
- About 80 – 85 percent of farmers surveyed had indicated that they had received training on usage of pesticides. However, since not all farmers were trained, there is a possibility of contamination of soil and farm products due to pesticides and agrochemical residues.
- 40 percent farmers have indicated that they were aware of biofertilizers and biopesticides. The use of chemical pesticides and agrochemicals prevails especially in horticulture and cotton farming segments. Farmers have indicated that the price of bio pesticides and fertilizers are high and hence they can't afford to use them.

### 6.10.1.2 Solid Waste generation and Land Pollution

Environmental impacts on land use due to solid waste generation identified during the study are as follows:

- Food processing industry generates solid waste in the form of vegetable and fruit waste such as seeds, skin etc and related. It was informed during the survey by two food processing industries out of two industries sampled that organic fraction is mostly composted. However, no proper mechanism for waste collection and scientific processing exist.
- Nine fruit and vegetable markets were surveyed and seven out of nine were observed to have no proper mechanism of solid waste collection, segregation and scientific processing.
- Empty containers of chemical fertilizers, pesticides and other agrochemicals are hazardous, and the farmers are not fully aware of the impact. Farmers has responded that they just throw away the containers.
- Solid waste will be generated during the civil construction activities for any proposed expansion of CBOs / Warehouses / Cold storages during the project implementation stage.

### 6.10.1.3 Potential Water Quality Impacts

Environmental impacts on the water quality identified during the study are as follows:

- Ground water and surface water quality can be impacted if the fertilizers and pesticides are not used in correct dosage and at proper time and specified mode of application. Since there is no infrastructure intervention, regulation and monitoring of excess utilisation of fertilisers so there are chances of contamination
- Effluent is also generated from food processing industry in the form of effluent due to cleaning of raw materials, washing of utensils and boiler blow down if applicable. Two food processing industries were consulted. Both the industries have responded that the effluent generated is treated along with sewage in septic tank.

### 6.10.1.4 Air Quality Impacts

Environmental impact on air quality identified during the study are as follows:

- In the absence of knowledge on soil quality, there are chances of excessive fertilizer usage by farmers. This can result in emission of  $N_2O$  from agriculture fields with high amount of nitrogenous fertilizers.
- Burning of crop residue can result in emission of harmful pollutants such as  $CO_2$ ,  $NO_x$ ,  $SO_2$ ,  $CO$ ,  $CH_4$  to atmosphere resulting in deterioration of air quality.
- Air quality is impacted due to emission of  $NO_x$  and particulate matter from vehicles used for transportation of farm produce.
- Air Emission from food processing industry due to burning of fuel in boiler, operation of D.G sets or usage of fuel for other processes.
- Methane is emitted due to microbial fermentation of feed in the digestive track of goat and sheep, cows and buffaloes.
- Air quality is also impacted due to usage of construction machineries during construction of new warehouse / cold storage/ expansion activities.

### 6.10.1.5 Noise quality impacts

Impact on noise quality identified during the study are as follows:

- Noise quality impact during construction stage of warehouse or other facilities due to operation of machineries.
- Noise pollution due to operation of D.G sets from warehouse, markets and retails.
- Noise pollution due to operation of equipment in the food processing industries.

#### 6.10.1.6 Impact on Ecological and Living Organisms

Impact on biodiversity and natural habitat identified during the study are as follows:

- Chemical pesticides if not proven for the target pest can be harmful to other organism dwelling in the farm lands.
- Chemical fertilizers and pesticides if used just prior to sudden rain fall can result in run-off causing impact on the aquatic ecosystem.
- The survey indicates that farmers are made aware of the integrated pest management system and usage of biological measures of pest control. Farmers are using biopesticides such as neem oil, sticky traps to control pest and use big red ants to control seed borer attack. However, the survey also indicates use of chemical pesticides by farmers and names of some of the pesticide revealed to have been in use are Phorate, Zineb, Malathion, Confidor, Karate, Kocide, DDT, Monocrotophos, carbofurans, ridomil, blue copper Z-78, Dithane M-45. Out of these Phorate, DDT and Monocrotophos are classified as class I insecticide by WHO.
- During the survey it was also revealed that goat and sheep rearing farmers do take their livestock to forest for grazing.

#### 6.10.1.7 Potential Health and Safety Impacts on Farmers

Impact on farmers health and safety identified during the study are as follows:

- Safety issued due to injury caused to the farmers and agricultural labours due to usage of farm machineries, hand tools, and other sources such as snake bites, insects bites, falls etc.
- Health impacts due to usage of chemical pesticides and fertilizers without adequate personal protection equipment as indicated for their safe usage.
- Health and safety impacts were also identified for labourers involved in food processing industry, warehouse, cold storage, market due to inadequate usage of personal protection equipment.

#### 6.10.1.8 Health and Safety of Consumers

Impact on the consumer health identified during the study are as follows:

- Consumer health is impacted due to residue of pesticide and agrochemical left in the food grains beyond the Maximum Residue Level (MRL). Neither the CBOs nor the markets and processing units surveyed were having facility for testing of MRL.
- Stakeholder survey with Pune Residue Testing laboratory revealed that there are only two government pesticide testing laboratories in Maharashtra, and they detect only the presence of pesticide and not its quantity and further testing is done only for organic commodities and not for regular commodities.
- Processed food can also include additives more than the permitted limits that can impact the health of the consumers and there is no regular monitoring or testing of the additives.

## 6.10.2 Greenhouse Gas Emission Analysis

In response to terms of reference, greenhouse gas emission analysis has been conducted for six agreed commodities. These commodities include Cotton, Turmeric, Soybean, Okra, Banana and Goat Rearing.

SMART has prepared detailed project report for these commodities and GHG emission estimation has been done using Ex-ACT Value Chain tool developed by Food and Agriculture Organisation of the United Nations. The methodology and tool used is explained below.

### 6.10.2.1 EX-ACT VC tool

EX-ACT VC is a tool derived from EX-ACT (EX-Ante Carbon-balance Tool), developed by FAO in 2009. EX-ACT VC is processing and transportation framework of 8 Excel modules that provides appraisal of crop and livestock-based value chain in developing countries on GHGs emissions.

The EX-ACT VC aims at helping designing performance and identify areas to improve the value chain performance. The methodology provides here an environmental carbon-balance appraisal of the value chain impact, in terms of climate mitigation, adaptation and value chain resilience:

- **The impact on climate mitigation** is reflected through quantitative indicators, derived directly from the EX-ACT tool. These indicators are used to obtain and analyse the mitigation impacts in terms of tCO<sub>2</sub>-e of the project. The carbon footprint of the product is calculated for the whole value chain and at different stages, aiming at analysing the environmental performance of the chain. The equivalent economic return is also determined and could be an important aspect to be considered when attempting, for example, accessing payments for environmental services.
- **Value chain resilience** is assessed using simple quantitative and qualitative indicators. Adaptation indicators measure the reduction of vulnerability of people, livelihoods and ecosystems to Climate Change.

The carbon-balance is defined as the net balance from all GHGs expressed in carbon dioxide (CO<sub>2</sub>) equivalents that is emitted or sequestered due to project implementation as compared to a business-as-usual scenario.

EX-ACT is a land-based accounting system, estimating carbon (C) stock changes (i.e. emissions or sinks of CO<sub>2</sub>) as well as GHG emissions per unit of land, expressed in equivalent MT of CO<sub>2</sub> per hectare per year. The tool helps project designers to estimate and prioritize project activities with high benefits in economic and climate change mitigation terms. The amount of GHG mitigation may also be used as part of economic analysis as well as for the application for funding additional project components.

EX-ACT has been developed using mostly the Intergovernmental Panel on Climate Change 2006 Guidelines for National Greenhouse Gas Inventories (IPCC, 2006) that furnishes EX-ACT with recognized default values for emission factors and carbon values, the so-called Tier 1 level of precision. Besides, EX-ACT is based upon chapter 8 of the Fourth Assessment Report from working group III of the IPCC (Smith, *et al.*, 2007) for specific mitigation options not covered in the IPCC (2006).

The GHG analysis is explained in summarising the project boundary of each commodity, assumptions of interventions, results.

### 6.10.3 Cotton Value Chain

| Item                                                   | Description                                                                                     | Other Assumption                                                                                                                                                                                        |
|--------------------------------------------------------|-------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project Budget                                         | USD 291,571                                                                                     |                                                                                                                                                                                                         |
| Duration of project                                    | 7 years from 2019                                                                               |                                                                                                                                                                                                         |
| Area of cultivation                                    | 9,000 Ha in current scenario<br>9,000 Ha in upgrading scenario                                  | Water saving will be result from measure of soil moisture conservation by promotion, training and capacity building. It is envisaged that 10 percent of water would be saved in the upgrading scenario. |
| Water Consumption at Farm level                        | 16 m <sup>3</sup> /year in current scenario<br>14.4 m <sup>3</sup> / year in upgrading scenario | Water saving will be result from measure of soil moisture conservation by promotion, training and capacity building.                                                                                    |
| <b>Fertiliser use</b>                                  |                                                                                                 |                                                                                                                                                                                                         |
| Urea                                                   | 200 kg/ha/year in current scenario<br>180 kg/ha/year in upgrading scenario                      | Promotion of INM and organic fertilisers. SMART has envisioned achievement of input reduction by 10 percent through imparting training on INM, precision farming practices, etc..                       |
| Diammonium Phosphate                                   | 125 kg/ha/year in current scenario<br>112.5 kg/ha/year in upgrading scenario                    | Promotion of INM and organic fertilisers. SMART has envisioned of input reduction by 10 percent.                                                                                                        |
| Muriate of Potash (MOP)                                | 100 kg/ha/year in current scenario<br>90 kg/ha/year in upgrading scenario                       | Promotion of INM and organic fertilisers. SMART has envisioned of input reduction by 10 percent.                                                                                                        |
| Single superphosphate (SSP)                            | 200 kg/ha/year in current scenario<br>180 kg/ha/year in upgrading scenario                      | Promotion of INM and organic fertilisers. SMART has envisioned of input reduction by 10 percent.                                                                                                        |
| NPK                                                    | 200 kg/ha/year in current scenario<br>180 kg/ha/year in upgrading scenario                      | Promotion of INM and organic fertilisers. SMART has envisioned of input reduction by 10 percent.                                                                                                        |
| <b>Pesticides</b>                                      |                                                                                                 |                                                                                                                                                                                                         |
| Herbicides (kg of active ingredient per year)          | 9947.5 kg/year in current scenario<br>8952.75 kg/year in upgraded scenario                      | Promotion of precision farming practices and training can capacity building. SMART has envisioned of input reduction by 10 percent.                                                                     |
| Insecticides (kg of active ingredient per year)        | 500 kg/year in current scenario<br>450 kg/year kg/year in upgrading scenario                    | Promotion of precision farming practices and training can capacity building. SMART has envisioned of input reduction by 10 percent.                                                                     |
| Fungicides (kg of active ingredient per year)          | Nil                                                                                             |                                                                                                                                                                                                         |
| <b>Energy consumption at Processing level</b>          |                                                                                                 |                                                                                                                                                                                                         |
| Energy Consumption for processing per MT of production | 373 kWh per MT of production current scenario<br>335.7 in upgrading scenario                    | The project will promote energy efficient equipment, machineries and vehicles. SMART has envisioned of improvement of efficiency by 10 percent.                                                         |
| Energy Consumption at Storage                          | Nil                                                                                             |                                                                                                                                                                                                         |

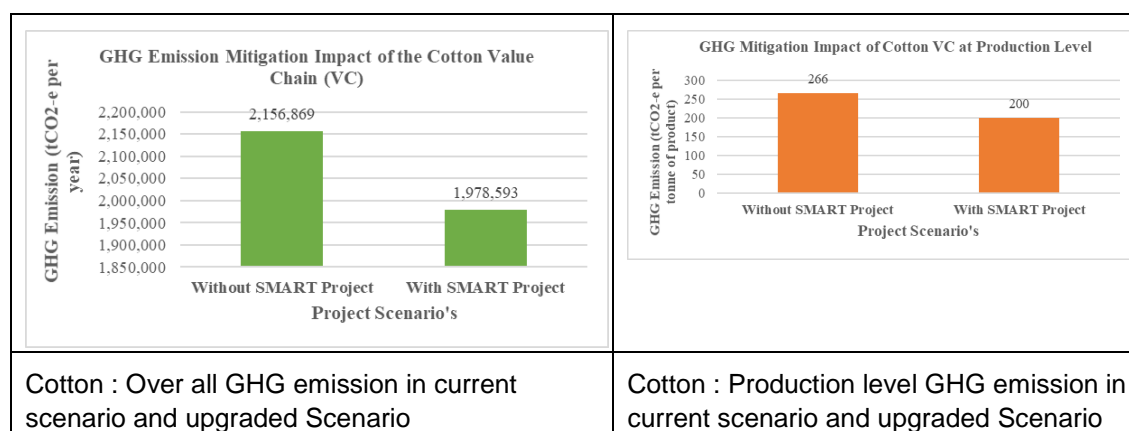
| Item                                                     | Description | Other Assumption                                             |
|----------------------------------------------------------|-------------|--------------------------------------------------------------|
| Consumable input in units per MT of processed production |             |                                                              |
| Transportation                                           |             |                                                              |
| Farm to Processing/ Storage distance in Kms              | 20 km       | No improvement in losses during transportation is envisioned |
| Storage to Wholesale distance in Kms                     | 600 km      | No improvement in losses during transportation is envisioned |

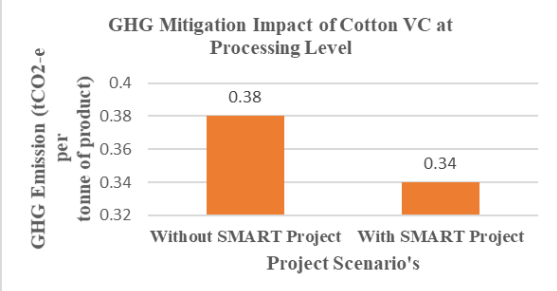
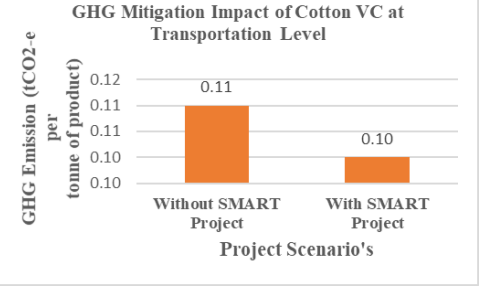
### 6.10.3.1 Results

| Climate Mitigation dimension of the Value Chain                                                     | Current   | Upgrading | Balance  |
|-----------------------------------------------------------------------------------------------------|-----------|-----------|----------|
| GHG impact (tCO <sub>2</sub> -e per year)                                                           | 2,156,869 | 1,978,593 | -178,276 |
| GHG impact (tCO <sub>2</sub> -e per year per hectare)                                               | 239.7     | 219.8     | -19.8    |
| Carbon footprint of production (tCO <sub>2</sub> -e per tonne of product)                           | 266.1     | 199.7     | -66.4    |
| e2-e [emitted (+) / reduced or avoided (-)]                                                         |           | -178,276  |          |
| Annual tCO <sub>2</sub> -e from renewable energy                                                    |           | 0         |          |
| Equivalent project cost per tonne of CO <sub>2</sub> -e reduced or avoided (in US\$ on 20 years)    |           | 0         |          |
| Equivalent value of mitigation impact per year (US\$ 30/tCO <sub>2</sub> -e)                        |           | 5,348,289 |          |
| Equivalent value of mitigation impact per year per Ha (US\$ 30/tCO <sub>2</sub> -e per year per Ha) |           | 594       |          |

Carbon footprint at the different levels of the Cotton Value Chain are given below.

| Carbon footprint at the different levels of the Value Chain | tCO <sub>2</sub> -e per tonne of product |           | Balance |
|-------------------------------------------------------------|------------------------------------------|-----------|---------|
|                                                             | Current                                  | Upgrading |         |
| PRODUCTION                                                  | 266.11                                   | 199.70    | -66.42  |
| PROCESSING                                                  | 0.38                                     | 0.34      | -0.04   |
| TRANSPORT                                                   | 0.11                                     | 0.11      | 0.00    |
| TOTAL                                                       | 266.61                                   | 200.15    | -66.46  |



|                                                                                                                                                 |                                                                                                                                                      |
|-------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p>GHG Mitigation Impact of Cotton VC at Processing Level</p> |  <p>GHG Mitigation Impact of Cotton VC at Transportation Level</p> |
| Cotton : Processing level GHG emission in current scenario and upgraded Scenario                                                                | Cotton : Transportation level GHG emission in current scenario and upgraded Scenario                                                                 |

#### 6.10.4 Turmeric Value Chain

| Item                                                           | Description                                                                                       | Other Assumption                                                                                                                                       |
|----------------------------------------------------------------|---------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project Budget                                                 | USD 786,429                                                                                       |                                                                                                                                                        |
| Duration of project                                            | 5 years from 2019                                                                                 |                                                                                                                                                        |
| Area of cultivation                                            | 280 Ha in current scenario<br>280 Ha in upgrading scenario                                        | The area of the project will remain same in the upgraded scenario as there is no addition of area envisaged to increase the productivity.              |
| Water Consumption at Farm level                                | 12000 cubic meter in current scenario<br>10800 cubic meter in upgraded scenario                   | Water saving will be result from measure of soil moisture conservation by promotion, training and capacity building.                                   |
| Energy Consumption at production level (Consumption of Diesel) | 3410 m <sup>3</sup> /year in current scenario<br>3069 m <sup>3</sup> / year in upgrading scenario | The project will promote energy efficient equipment, machineries and vehicles. SMART has envisioned of improvement of energy efficiency by 10 percent. |
| <b>Fertiliser use</b>                                          |                                                                                                   |                                                                                                                                                        |
| Urea                                                           | 122.4 kg/ha/year in current scenario<br>110.16 kg/ha/year in upgrading scenario                   | Promotion of INM and organic fertilisers. SMART has envisioned of input reduction by 10 percent.                                                       |
| Compost                                                        | 12,000 kg/ha/year in current scenario<br>13,600 kg/ha/year in upgrading scenario                  | Promotion of INM and organic fertilisers. SMART has envisioned of input reduction by 10 percent.                                                       |
| Muriate of Potash (MOP)                                        | 302 kg/ha/year in current scenario<br>272.16 kg/ha/year in upgrading scenario                     | Promotion of INM and organic fertilisers. SMART has envisioned of input reduction by 10 percent.                                                       |
| Single superphosphate (SSP)                                    | 48 kg/ha/year in current scenario<br>43.2 kg/ha/year in upgrading scenario                        | Promotion of INM and organic fertilisers. SMART has envisioned of input reduction by 10 percent.                                                       |
| <b>Pesticides</b>                                              |                                                                                                   |                                                                                                                                                        |
| Herbicides (kg of active ingredient per year)                  | Nil                                                                                               |                                                                                                                                                        |
| Insecticides (kg of active ingredient per year)                | 2.652 in current scenario<br>2.386 in upgraded scenario                                           | Promotion of precision farming practices and training and capacity building.                                                                           |

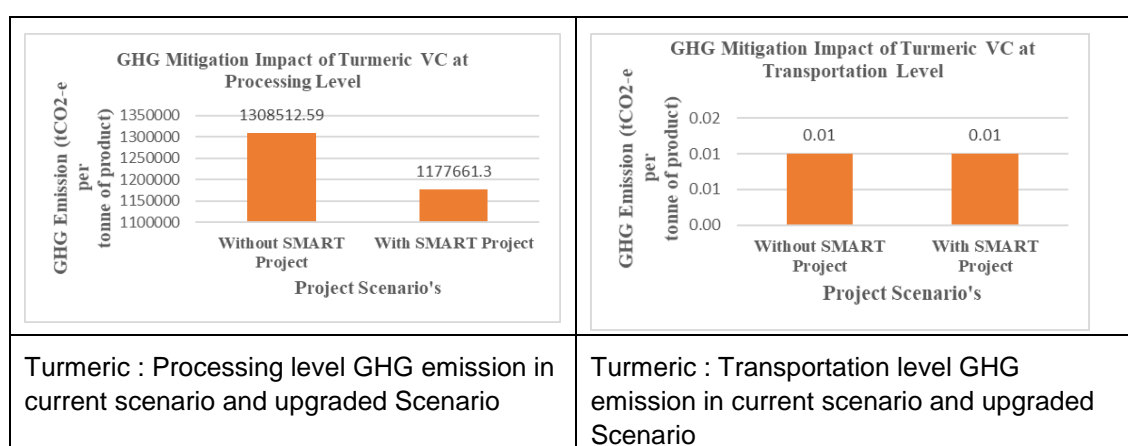
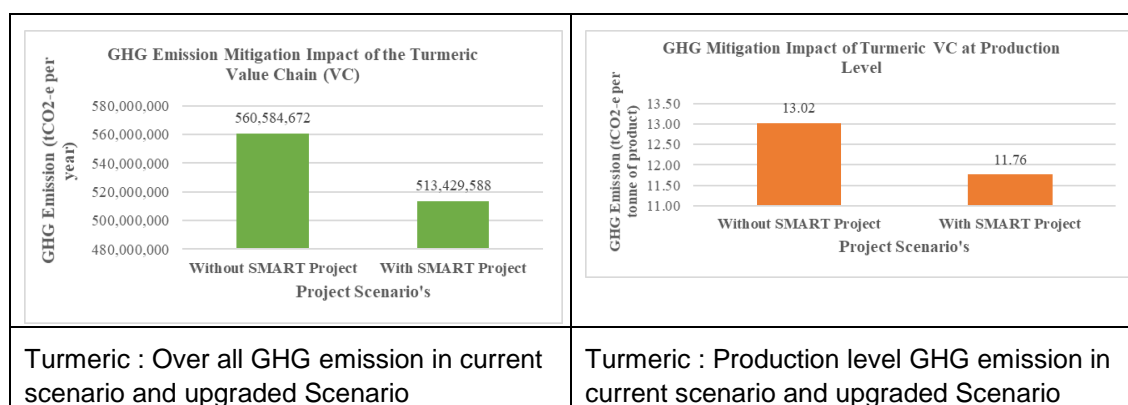
| Item                                                     | Description                                                                        | Other Assumption                                                                                                                                       |
|----------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fungicides (kg of active ingredient per year)            | 3.72 in current scenario<br>3.35 in upgrading scenario                             | Promotion of precision farming practices and training and capacity building.                                                                           |
| <b>Energy consumption at Processing level</b>            |                                                                                    |                                                                                                                                                        |
| Energy Consumption for processing per MT of production   | 10094 cubic meter in current scenario<br>9084 cubic meter in upgrading scenario    | The project will promote energy efficient equipment, machineries and vehicles. SMART has envisioned of improvement of energy efficiency by 10 percent. |
| Energy Consumption at Storage                            | Nil                                                                                |                                                                                                                                                        |
| Consumable input in units per MT of processed production | 10 units per MT of processed production<br>10 units per MT of processed production |                                                                                                                                                        |
| <b>Transportation</b>                                    |                                                                                    |                                                                                                                                                        |
| Farm to aggregator distance in Kms                       | 2.5 km                                                                             | No improvement in losses during transportation is envisioned                                                                                           |
| Aggregator to processing and storage location            | 0 km                                                                               | No improvement in losses during transportation is envisioned                                                                                           |
| Processing and storage location to Retailer              | 20 Km                                                                              | No improvement in losses during transportation is envisioned                                                                                           |

#### 6.10.4.1 Results

| Climate Mitigation dimension of the Value Chain                                                     | Current     | Upgrading   | Balance     |
|-----------------------------------------------------------------------------------------------------|-------------|-------------|-------------|
| GHG impact (tCO <sub>2</sub> -e per year)                                                           | 560,584,672 | 513,429,588 | -47,155,084 |
| GHG impact (tCO <sub>2</sub> -e per year per hectare)                                               | 1,001,044.1 | 916,838.5   | -84,205.5   |
| Carbon footprint of production (tCO <sub>2</sub> -e per tonne of product)                           | 13.0        | 11.8        | -1.3        |
| eCO <sub>2</sub> -e [emitted (+) / reduced or avoided (-)]                                          |             | -47,155,084 |             |
| Annual tCO <sub>2</sub> -e from renewable energy                                                    |             | 0           |             |
| Equivalent project cost per tonne of CO <sub>2</sub> -e reduced or avoided (in US\$ on 20 years)    |             | 1           |             |
| Equivalent value of mitigation impact per year (US\$ 30/tCO <sub>2</sub> -e)                        |             | 899,876     |             |
| Equivalent value of mitigation impact per year per Ha (US\$ 30/tCO <sub>2</sub> -e per year per Ha) |             | 1,607       |             |

Carbon footprint at the different levels of the Turmeric Value Chain are given below.

| Carbon footprint at the different levels of the Value Chain | tCO <sub>2</sub> -e per tonne of product |              | Balance     |
|-------------------------------------------------------------|------------------------------------------|--------------|-------------|
|                                                             | Current                                  | Upgrading    |             |
| PRODUCTION                                                  | 13.02                                    | 11.76        | -1.26       |
| PROCESSING                                                  | 1,308,512.59                             | 1,177,661.34 | -130,851.26 |
| TRANSPORT                                                   | 0.01                                     | 0.01         | 0.00        |
| Total                                                       | 1,308,525.62                             | 1,177,673.10 | -130,852.52 |



### 6.10.5 Soybean Value Chain

| Item                                                           | Description                                                                                               | Other Assumption                                                                                                                                                    |
|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project Budget                                                 | USD 1,763,871                                                                                             |                                                                                                                                                                     |
| Duration of project                                            | 5 years from 2019                                                                                         |                                                                                                                                                                     |
| Area of cultivation                                            | 20,000 Ha in current scenario<br>20,000 Ha in upgrading scenario                                          | Addition of area envisaged to increase the productivity                                                                                                             |
| Yield                                                          | 2 MT per ha<br>Percentage waste<br>20 percent in Current scenario<br>18 percent in upgrading scenario     |                                                                                                                                                                     |
| Water Consumption at Farm level                                | 4,000 cubic meter in current scenario<br>3,600 cubic meter in upgraded scenario                           | Water saving will be result from measure of soil moisture conservation by promotion, training and capacity building. It is envisaged that 10 percent will be saved. |
| Energy Consumption at production level (Consumption of Diesel) | 2,00,000 m <sup>3</sup> /year in current scenario<br>1,80,000 m <sup>3</sup> / year in upgrading scenario | The project will promote energy efficient equipment, machineries and vehicles. SMART has envisioned of improvement of energy efficiency by 10 percent.              |
| <b>Fertiliser use</b>                                          |                                                                                                           |                                                                                                                                                                     |

| Item                                                     | Description                                                                                | Other Assumption                                                                                                                                       |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| Baramati 16                                              | 137.5 kg/ha/year in current scenario<br>123.75 kg/ha/year in upgrading scenario            | Promotion of INM and organic fertilisers. SMART has envisioned of input reduction by 10 percent.                                                       |
| Compost                                                  | Nil kg/ha/year in current scenario<br>27.5 kg/ha/year in upgrading scenario                | Promotion of INM and organic fertilisers. SMART has envisioned of input reduction by 10 percent.                                                       |
| DAP                                                      | 302 kg/ha/year in current scenario<br>272.16 kg/ha/year in upgrading scenario              | Promotion of INM and organic fertilisers. SMART has envisioned of input reduction by 10 percent.                                                       |
| <b>Pesticides</b>                                        |                                                                                            |                                                                                                                                                        |
| Herbicides (kg of active ingredient per year)            | Nil                                                                                        |                                                                                                                                                        |
| Insecticides (kg of active ingredient per year)          | 1.45 in current scenario<br>1.3 in upgraded scenario                                       | Promotion of precision farming practices and training and capacity building. SMART has envisioned of input reduction by 10 percent.                    |
| Fungicides (kg of active ingredient per year)            | Nil                                                                                        |                                                                                                                                                        |
| <b>Energy consumption at Processing level</b>            |                                                                                            |                                                                                                                                                        |
| Energy Consumption for processing per MT of production   | 11,660 kWh in current scenario<br>10,494 cubic meter in upgrading scenario                 | The project will promote energy efficient equipment, machineries and vehicles. SMART has envisioned of improvement of energy efficiency by 10 percent. |
| Energy Consumption at Storage                            | Nil                                                                                        |                                                                                                                                                        |
| Consumable input in units per MT of processed production | 4,00,000 jute bags in current scenario<br>4,00,000 unit of jute bags in upgrading scenario | No change in upgrading scenario                                                                                                                        |
| <b>Transportation</b>                                    |                                                                                            |                                                                                                                                                        |
| Farm to Aggregator                                       | 10 km                                                                                      | No improvement in losses during transportation is envisioned                                                                                           |
| Aggregators to processing and storage location           | 25 km                                                                                      | No improvement in losses during transportation is envisioned                                                                                           |
| Processing and storage location to Retailer              | 10 Km                                                                                      | No improvement in losses during transportation is envisioned                                                                                           |

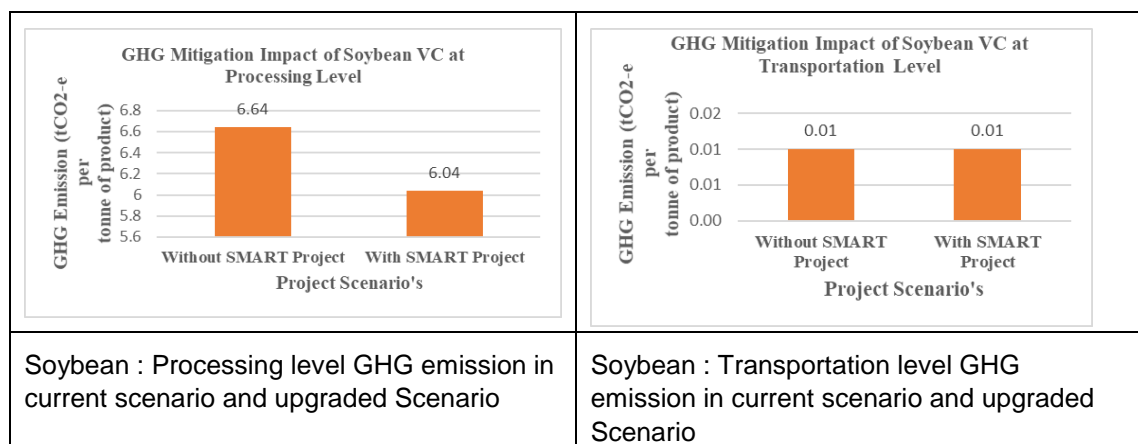
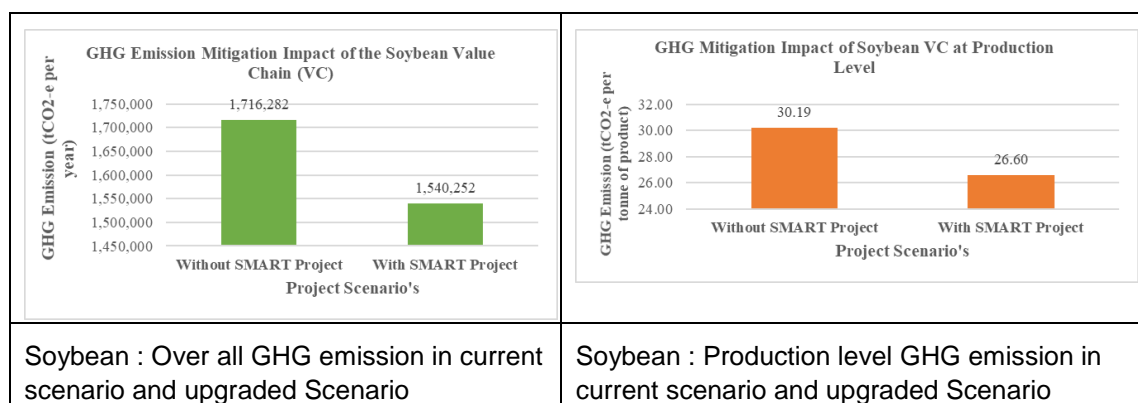
### 6.10.5.1 Results

| Climate Mitigation dimension of the Value Chain                                                  | Current | Upgrading | Balance |
|--------------------------------------------------------------------------------------------------|---------|-----------|---------|
| GHG impact (tCO <sub>2</sub> -e per year)                                                        | 516,958 | 463,941   | -53,017 |
| GHG impact (tCO <sub>2</sub> -e per year per hectare)                                            | 12.9    | 11.6      | -1.3    |
| Carbon footprint of production (tCO <sub>2</sub> -e per tonne of product)                        | 30.2    | 26.6      | -3.6    |
| eCO <sub>2</sub> -e [emitted (+) / reduced or avoided (-)]                                       |         | -53,017   |         |
| Annual tCO <sub>2</sub> -e from renewable energy                                                 |         | 0         |         |
| Equivalent project cost per tonne of CO <sub>2</sub> -e reduced or avoided (in US\$ on 20 years) |         | 8         |         |
| Equivalent value of mitigation impact per year (US\$ 30/tCO <sub>2</sub> -e)                     |         | 318,472   |         |

| Climate Mitigation dimension of the Value Chain                                                     | Current | Upgrading | Balance |
|-----------------------------------------------------------------------------------------------------|---------|-----------|---------|
| Equivalent value of mitigation impact per year per Ha (US\$ 30/tCO <sub>2</sub> -e per year per Ha) |         | 8         |         |

Carbon footprint at the different levels of the Soybean Value Chain are given below.

| Carbon footprint at the different levels of the Value Chain | tCO <sub>2</sub> -e per tonne of product |              | Balance      |
|-------------------------------------------------------------|------------------------------------------|--------------|--------------|
|                                                             | Current                                  | Upgrading    |              |
| PRODUCTION                                                  | 30.21                                    | 26.62        | -3.58        |
| PROCESSING                                                  | 6.64                                     | 6.04         | -0.59        |
| TRANSPORT                                                   | 0.01                                     | 0.01         | 0.00         |
| <b>Total</b>                                                | <b>36.85</b>                             | <b>32.68</b> | <b>-4.18</b> |



### 6.10.6 Okra Value Chain

| Item                | Description                                              | Other Assumption                                                     |
|---------------------|----------------------------------------------------------|----------------------------------------------------------------------|
| Project Budget      | USD 574,286                                              |                                                                      |
| Duration of project | 5 years from 2019                                        |                                                                      |
| Area of cultivation | 20 Ha in current scenario<br>20 Ha in upgrading scenario | The area of the project will remain same in the upgraded scenario as |

| Item                                                           | Description                                                                                            | Other Assumption                                                                                                                                                    |
|----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                |                                                                                                        | there is no promotion for area increase.                                                                                                                            |
| Yield                                                          | 12 MT per ha<br>Percentage waste<br>17 percent in Current scenario<br>16 percent in upgrading scenario | The yield will not be changed in the upgraded scenario but there will be saving in wastage and it is envisioned the waste will be reduced by 10 percent.            |
| Water Consumption at Farm level                                | 11,400,000 cubic meter in current scenario<br>10,260,000 cubic meter in upgraded scenario              | Water saving will be result from measure of soil moisture conservation by promotion, training and capacity building. It is envisaged that 10 percent will be saved. |
| Energy Consumption at production level (Consumption of Diesel) | Nil                                                                                                    |                                                                                                                                                                     |
| <b>Fertiliser use</b>                                          |                                                                                                        |                                                                                                                                                                     |
| NPK                                                            | 250 kg/ha/year in current scenario<br>225 kg/ha/year in upgrading scenario                             | Promotion of INM and organic fertilisers. SMART has envisioned of input reduction by 10 percent.                                                                    |
| Compost                                                        | 7,500 kg/ha/year in current scenario<br>8,250 kg/ha/year in upgrading scenario                         | Promotion of INM and organic fertilisers. SMART has envisioned of input reduction by 10 percent.                                                                    |
| SSP                                                            | 250 kg/ha/year in current scenario<br>225 kg/ha/year in upgrading scenario                             | Promotion of INM and organic fertilisers. SMART has envisioned of input reduction by 10 percent.                                                                    |
| <b>Pesticides</b>                                              |                                                                                                        |                                                                                                                                                                     |
| Herbicides (kg of active ingredient per year)                  | Nil                                                                                                    |                                                                                                                                                                     |
| Insecticides (kg of active ingredient per year)                | 1.85 in current scenario<br>1.67 in upgraded scenario                                                  | Promotion of precision farming practices and training and capacity building will result 10 percent benefit.                                                         |
| Fungicides (kg of active ingredient per year)                  | 1.25 in current scenario<br>1.12 in upgraded scenario                                                  |                                                                                                                                                                     |
| <b>Energy consumption at Processing level</b>                  |                                                                                                        |                                                                                                                                                                     |
| Energy Consumption for processing per MT of production         | Nil                                                                                                    |                                                                                                                                                                     |
| Energy Consumption at Storage                                  | 24,000 kWh per day in current scenario<br>21,600 kWh per day in upgrading scenario                     | The project will promote energy efficient equipment, machineries and vehicles. SMART has envisioned improvement of achievement of efficiency by 10 percent.         |
| Consumable input in units per MT of processed production       | 12,000 plastic carats of 20 kg each in current scenario<br>Same in upgraded scenario.                  | No change in upgrading scenario                                                                                                                                     |
| <b>Transportation</b>                                          |                                                                                                        |                                                                                                                                                                     |
| Farm to Collector                                              | 5 km                                                                                                   | No improvement in losses during transportation is envisioned                                                                                                        |
| Collectors to processing and storage location                  | 382 km                                                                                                 | No improvement in losses during transportation is envisioned                                                                                                        |

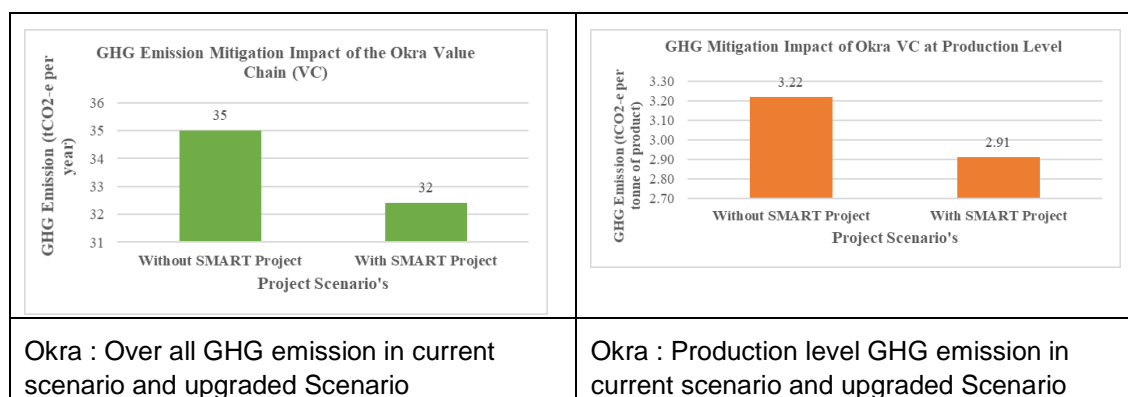
| Item                                        | Description | Other Assumption                                             |
|---------------------------------------------|-------------|--------------------------------------------------------------|
| Processing and storage location to Retailer | 1941 Km     | No improvement in losses during transportation is envisioned |

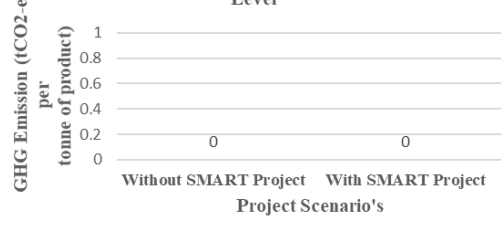
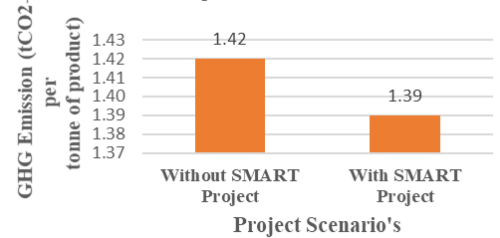
### 6.10.6.1 Results

| Climate Mitigation dimension of the Value Chain                                                     | Current | Upgrading | Balance |
|-----------------------------------------------------------------------------------------------------|---------|-----------|---------|
| GHG impact (tCO <sub>2</sub> -e per year)                                                           | 701     | 648       | -53     |
| GHG impact (tCO <sub>2</sub> -e per year per hectare)                                               | 35.0    | 32.4      | -2.6    |
| Carbon footprint of production (tCO <sub>2</sub> -e per tonne of product)                           | 3.2     | 2.9       | -0.3    |
| tCO <sub>2</sub> -e [emitted (+) / reduced or avoided (-)]                                          |         | -53       |         |
| Annual tCO <sub>2</sub> -e from renewable energy                                                    |         | 0         |         |
| Equivalent project cost per tonne of CO <sub>2</sub> -e reduced or avoided (in US\$ on 20 years)    |         | 0         |         |
| Equivalent value of mitigation impact per year (US\$ 30/tCO <sub>2</sub> -e)                        |         | 0         |         |
| Equivalent value of mitigation impact per year per Ha (US\$ 30/tCO <sub>2</sub> -e per year per Ha) |         | -2        |         |

Carbon footprint at the different levels of the Okra Value Chain are given below.

| Carbon footprint at the different levels of the Value Chain | tCO <sub>2</sub> -e per tonne of product |           | Balance |
|-------------------------------------------------------------|------------------------------------------|-----------|---------|
|                                                             | Current                                  | Upgrading |         |
| PRODUCTION                                                  | 3.22                                     | 2.91      | -0.30   |
| PROCESSING                                                  | 0.00                                     | 0.00      | 0.00    |
| TRANSPORT                                                   | 1.42                                     | 1.39      | -0.03   |
| Total                                                       | 4.63                                     | 4.30      | -0.33   |



|                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p style="text-align: center;"><b>GHG Mitigation Impact of Okra VC at Processing Level</b></p>  <p style="text-align: center;">Project Scenario's</p> | <p style="text-align: center;"><b>GHG Mitigation Impact of Okra VC at Transportation Level</b></p>  <p style="text-align: center;">Project Scenario's</p> |
| <p>Okra: No Change. Processing level GHG emission in current scenario and upgraded Scenario</p>                                                                                                                                        | <p>Okra : Transportation level GHG emission in current scenario and upgraded Scenario</p>                                                                                                                                                   |

### 6.10.7 Banana Value Chain

| Item                                                           | Description                                                                                            | Other Assumption                                                                                                                                                    |
|----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project Budget                                                 | USD 2,048,143                                                                                          |                                                                                                                                                                     |
| Duration of project                                            | 5 years from 2019                                                                                      |                                                                                                                                                                     |
| Area of cultivation                                            | 833 Ha in current scenario<br>833 Ha in upgrading scenario                                             | The area of the project will remain same in the upgraded scenario as there is no promotion for area increase.                                                       |
| Yield                                                          | 23 MT per ha<br>Percentage waste<br>17 percent in Current scenario<br>15 percent in upgrading scenario |                                                                                                                                                                     |
| Water Consumption at Farm level                                | 9,996 cubic meter in current scenario<br>8,996 cubic meter in upgraded scenario                        | Water saving will be result from measure of soil moisture conservation by promotion, training and capacity building. It is envisaged that 10 percent will be saved. |
| Energy Consumption at production level (Consumption of Diesel) | Nil                                                                                                    |                                                                                                                                                                     |
| <b>Fertiliser use</b>                                          |                                                                                                        |                                                                                                                                                                     |
| Urea                                                           | 1,078 kg/ha/year in current scenario<br>970 kg/ha/year in upgrading scenario                           | Promotion of INM and organic fertilisers. SMART has envisioned of input reduction by 10 percent.                                                                    |
| Compost                                                        | Nil kg/ha/year in current scenario<br>1,000 kg/ha/year in upgrading scenario                           | Promotion of INM and organic fertilisers. SMART has envisioned of input reduction by 10 percent.                                                                    |
| SSP                                                            | 1,786 kg/ha/year in current scenario<br>1,607 kg/ha/year in upgrading scenario                         | Promotion of INM and organic fertilisers. SMART has envisioned of input reduction by 10 percent.                                                                    |
| MoP                                                            | 1,286 kg/ha/year in current scenario<br>1,157 kg/ha/year in upgrading scenario                         | Promotion of INM and organic fertilisers. SMART has envisioned of input reduction by 10 percent.                                                                    |
| <b>Pesticides</b>                                              |                                                                                                        |                                                                                                                                                                     |
| Herbicides (kg of active ingredient per year)                  | Nil                                                                                                    |                                                                                                                                                                     |

| Item                                                                                                       | Description                                                                                        | Other Assumption                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Insecticides (kg of active ingredient per year)                                                            | 0.471 in current scenario<br>0.424 in upgraded scenario                                            | Promotion of precision farming practices and training and capacity building will result 10 percent benefit.                                                                 |
| Fungicides (kg of active ingredient per year)                                                              | Nil                                                                                                |                                                                                                                                                                             |
| <b>Energy consumption at Processing level</b>                                                              |                                                                                                    |                                                                                                                                                                             |
| Energy Consumption for processing per MT of production                                                     | Nil                                                                                                |                                                                                                                                                                             |
| Energy Consumption at Storage                                                                              | 212,962 kWh per day in current scenario<br>191,665 kWh per day in upgrading scenario               | Promotion of energy efficient equipment and energy efficient refrigeration.                                                                                                 |
| Consumable input in units per MT of processed production                                                   | 191,590 plastic bags in current scenario<br>95,795 unit of plastic bags bags in upgrading scenario | The reusable plastic bags will be promoted which can be used for three times in upgrading scenario. It is envisioned the 50 percent saving will happen in the plastic bags. |
| <b>Transportation</b>                                                                                      |                                                                                                    |                                                                                                                                                                             |
| Farm to Aggregator                                                                                         | 50 km                                                                                              | No improvement in losses during transportation is envisioned                                                                                                                |
| Aggregator to processing and storage location                                                              | 400 km                                                                                             | No improvement in losses during transportation is envisioned                                                                                                                |
| Processing and storage location to Retailer. In this case banana is exported to Dubai from Mumbai airport. | 2000 Km                                                                                            | No improvement in losses during transportation is envisioned                                                                                                                |

### 6.10.7.1 Results

| Climate Mitigation dimension of the Value Chain                           | Current | Upgrading | Balance |
|---------------------------------------------------------------------------|---------|-----------|---------|
| GHG impact (tCO <sub>2</sub> -e per year)                                 | 36,765  | 34,128    | -2,637  |
| GHG impact (tCO <sub>2</sub> -e per year per hectare)                     | 44.1    | 41.0      | -3.2    |
| Carbon footprint of production (tCO <sub>2</sub> -e per tonne of product) | 1.6     | 1.5       | -0.1    |
| Annual tCO <sub>2</sub> -e [emitted (+) / reduced or avoided (-)]         |         | -2,637    |         |

Carbon footprint at the different levels of the Banana Value Chain are given below.

| Carbon footprint at the different levels of the Value Chain | tCO <sub>2</sub> -e per tonne of product |           | Balance |
|-------------------------------------------------------------|------------------------------------------|-----------|---------|
|                                                             | Current                                  | Upgrading |         |
| PRODUCTION                                                  | 1.62                                     | 1.41      | -0.14   |
| PROCESSING                                                  | 0.00                                     | 0.00      | 0.00    |
| TRANSPORT                                                   | 1.47                                     | 1.44      | -0.03   |
| Total                                                       | 3.09                                     | 2.93      | -0.17   |

| <p><b>GHG Emission Mitigation Impact of the Banana Value Chain (VC)</b></p> <table border="1"> <thead> <tr> <th>Project Scenario's</th> <th>GHG Emission (tCO<sub>2</sub>-e per year)</th> </tr> </thead> <tbody> <tr> <td>Without SMART Project</td> <td>36,765</td> </tr> <tr> <td>With SMART Project</td> <td>34,128</td> </tr> </tbody> </table> | Project Scenario's                                                              | GHG Emission (tCO <sub>2</sub> -e per year) | Without SMART Project | 36,765 | With SMART Project | 34,128 | <p><b>GHG Mitigation Impact of Banana VC at Production Level</b></p> <table border="1"> <thead> <tr> <th>Project Scenario's</th> <th>GHG Emission (tCO<sub>2</sub>-e per tonne of product)</th> </tr> </thead> <tbody> <tr> <td>Without SMART Project</td> <td>1.62</td> </tr> <tr> <td>With SMART Project</td> <td>1.48</td> </tr> </tbody> </table> | Project Scenario's | GHG Emission (tCO <sub>2</sub> -e per tonne of product) | Without SMART Project | 1.62 | With SMART Project | 1.48 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------|-----------------------|--------|--------------------|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------------------------|-----------------------|------|--------------------|------|
| Project Scenario's                                                                                                                                                                                                                                                                                                                                   | GHG Emission (tCO <sub>2</sub> -e per year)                                     |                                             |                       |        |                    |        |                                                                                                                                                                                                                                                                                                                                                       |                    |                                                         |                       |      |                    |      |
| Without SMART Project                                                                                                                                                                                                                                                                                                                                | 36,765                                                                          |                                             |                       |        |                    |        |                                                                                                                                                                                                                                                                                                                                                       |                    |                                                         |                       |      |                    |      |
| With SMART Project                                                                                                                                                                                                                                                                                                                                   | 34,128                                                                          |                                             |                       |        |                    |        |                                                                                                                                                                                                                                                                                                                                                       |                    |                                                         |                       |      |                    |      |
| Project Scenario's                                                                                                                                                                                                                                                                                                                                   | GHG Emission (tCO <sub>2</sub> -e per tonne of product)                         |                                             |                       |        |                    |        |                                                                                                                                                                                                                                                                                                                                                       |                    |                                                         |                       |      |                    |      |
| Without SMART Project                                                                                                                                                                                                                                                                                                                                | 1.62                                                                            |                                             |                       |        |                    |        |                                                                                                                                                                                                                                                                                                                                                       |                    |                                                         |                       |      |                    |      |
| With SMART Project                                                                                                                                                                                                                                                                                                                                   | 1.48                                                                            |                                             |                       |        |                    |        |                                                                                                                                                                                                                                                                                                                                                       |                    |                                                         |                       |      |                    |      |
| Banana : Over all GHG emission in current scenario and upgraded Scenario                                                                                                                                                                                                                                                                             | Banana: Production level GHG emission in current scenario and upgraded Scenario |                                             |                       |        |                    |        |                                                                                                                                                                                                                                                                                                                                                       |                    |                                                         |                       |      |                    |      |

| <p><b>GHG Mitigation Impact of Banana VC at Processing Level</b></p> <table border="1"> <thead> <tr> <th>Project Scenario's</th> <th>GHG Emission (tCO<sub>2</sub>-e per tonne of product)</th> </tr> </thead> <tbody> <tr> <td>Without SMART Project</td> <td>0</td> </tr> <tr> <td>With SMART Project</td> <td>0</td> </tr> </tbody> </table> | Project Scenario's                                                                   | GHG Emission (tCO <sub>2</sub> -e per tonne of product) | Without SMART Project | 0 | With SMART Project | 0 | <p><b>GHG Mitigation Impact of Banana VC at Transportation Level</b></p> <table border="1"> <thead> <tr> <th>Project Scenario's</th> <th>GHG Emission (tCO<sub>2</sub>-e per tonne of product)</th> </tr> </thead> <tbody> <tr> <td>Without SMART Project</td> <td>1.47</td> </tr> <tr> <td>With SMART Project</td> <td>1.44</td> </tr> </tbody> </table> | Project Scenario's | GHG Emission (tCO <sub>2</sub> -e per tonne of product) | Without SMART Project | 1.47 | With SMART Project | 1.44 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------|-----------------------|---|--------------------|---|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------------------------------------------------------|-----------------------|------|--------------------|------|
| Project Scenario's                                                                                                                                                                                                                                                                                                                              | GHG Emission (tCO <sub>2</sub> -e per tonne of product)                              |                                                         |                       |   |                    |   |                                                                                                                                                                                                                                                                                                                                                           |                    |                                                         |                       |      |                    |      |
| Without SMART Project                                                                                                                                                                                                                                                                                                                           | 0                                                                                    |                                                         |                       |   |                    |   |                                                                                                                                                                                                                                                                                                                                                           |                    |                                                         |                       |      |                    |      |
| With SMART Project                                                                                                                                                                                                                                                                                                                              | 0                                                                                    |                                                         |                       |   |                    |   |                                                                                                                                                                                                                                                                                                                                                           |                    |                                                         |                       |      |                    |      |
| Project Scenario's                                                                                                                                                                                                                                                                                                                              | GHG Emission (tCO <sub>2</sub> -e per tonne of product)                              |                                                         |                       |   |                    |   |                                                                                                                                                                                                                                                                                                                                                           |                    |                                                         |                       |      |                    |      |
| Without SMART Project                                                                                                                                                                                                                                                                                                                           | 1.47                                                                                 |                                                         |                       |   |                    |   |                                                                                                                                                                                                                                                                                                                                                           |                    |                                                         |                       |      |                    |      |
| With SMART Project                                                                                                                                                                                                                                                                                                                              | 1.44                                                                                 |                                                         |                       |   |                    |   |                                                                                                                                                                                                                                                                                                                                                           |                    |                                                         |                       |      |                    |      |
| Banana: No Change. Processing level GHG emission in current scenario and upgraded Scenario                                                                                                                                                                                                                                                      | Banana : Transportation level GHG emission in current scenario and upgraded Scenario |                                                         |                       |   |                    |   |                                                                                                                                                                                                                                                                                                                                                           |                    |                                                         |                       |      |                    |      |

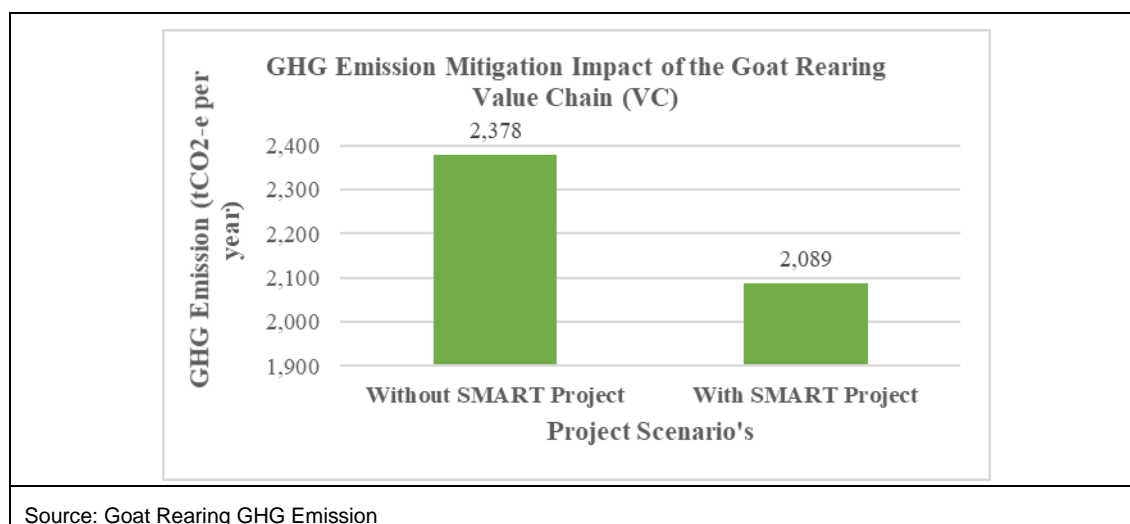
### 6.10.8 Goat Rearing

| Item                                                           | Description                                                                        | Other Assumption                              |
|----------------------------------------------------------------|------------------------------------------------------------------------------------|-----------------------------------------------|
| Project Budget                                                 | USD 69,257                                                                         |                                               |
| Duration of project                                            | 5 years from 2019                                                                  |                                               |
| Area of open grazing                                           | 50 Ha estimated in current scenario<br>Nil Ha in upgrading scenario                | Open grazing will not be support.             |
| No of Goats                                                    | 3,640 in current scenario<br>8,176 in upgrading scenario                           |                                               |
|                                                                | Mortality<br>10 percent in current scenario and<br>8 percent in upgrading scenario |                                               |
| Water Consumption at Farm level                                | 3,650 cubic meter in current scenario<br>No change in water consumption            | No change in water consumption is envisioned. |
| Feed Consumption                                               | 4,562,500 MT per year in current scenario,<br>No changes in upgraded scenario      | No changes in upgraded scenario.              |
| Energy Consumption at production level (Consumption of Diesel) | Nil                                                                                |                                               |
| <b>Energy consumption at Processing level</b>                  |                                                                                    |                                               |

| Item                                                     | Description                                                                                                        | Other Assumption                                             |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| Energy Consumption for processing per MT of production   | 20 kWh per MT of processed product in current scenario<br>18 kWh per MT of processed product in upgrading scenario |                                                              |
| Energy Consumption at Storage                            | Nil                                                                                                                |                                                              |
| Consumable input in units per MT of processed production | Nil                                                                                                                |                                                              |
| <b>Transportation</b>                                    |                                                                                                                    |                                                              |
| Farm to Aggregator                                       | 7 km                                                                                                               | No improvement in losses during transportation is envisioned |
| Aggregators to processing and storage location           | 125 km                                                                                                             | No improvement in losses during transportation is envisioned |

#### 6.10.8.1 Results

| Climate Mitigation dimension of the Value Chain                           | Current | Upgrading | Balance |
|---------------------------------------------------------------------------|---------|-----------|---------|
| GHG impact (tCO <sub>2</sub> -e per year)                                 | 1,059   | 1,924     | 865     |
| GHG impact (tCO <sub>2</sub> -e per year per hectare)                     | 21.2    | 38.5      | 17.3    |
| Carbon footprint of production (tCO <sub>2</sub> -e per tonne of product) | 0.0     | 0.0       | 0.0     |
| Annual tCO <sub>2</sub> -e [emitted (+) / reduced or avoided (-)]         |         | 865       |         |



### 6.10.9 Analysis of Greenhouse Gas Emission in relation to savings in the upgrading scenario

**Table 51: GHG Emission in Relation to Saving in the Upgradation Scenario**

| Commodity Value Chain | Climate Mitigation dimension of the Value Chain- GHG impact (tCO <sub>2</sub> -e per year) |             | Carbon footprint at the different levels of the Value Chain- (tCO <sub>2</sub> -e per tonne of product) |           |            |            |                |           |
|-----------------------|--------------------------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------------------|-----------|------------|------------|----------------|-----------|
|                       | Current                                                                                    | Upgrading   | Production                                                                                              |           | Processing |            | Transportation |           |
|                       |                                                                                            |             | Current                                                                                                 | Upgrading | Current    | Upgrading  | Current        | Upgrading |
| Cotton                | 21,56,869                                                                                  | 19,78,593   | 266.1                                                                                                   | 199.70    | 0.38       | 0.34       | 0.11           | 0.11      |
| Turmeric              | 5605,84,672                                                                                | 5134,29,588 | 13.02                                                                                                   | 11.76     | 1308512.59 | 1177661.34 | 0.01           | 0.01      |
| Soybean               | 5,16,958                                                                                   | 4,63,941    | 30.21                                                                                                   | 26.62     | 6.64       | 6.04       | 0.01           | 0.01      |
| Okra                  | 35                                                                                         | 32.4        | 3.22                                                                                                    | 2.91      | 0.00       | 0.00       | 1.42           | 1.39      |
| Banana                | 36,765                                                                                     | 34,128      | 1.62                                                                                                    | 1.48      | 0.00       | 0.00       | 1.47           | 1.44      |
| Goat Rearing          | 1,059                                                                                      | 1,924       |                                                                                                         |           |            |            |                |           |

Source: Mott MacDonald Analysis

- Out of the above six commodities, turmeric has highest saving of GHG emission, cotton has moderate saving in unit area, while Cotton, Soybean, and Banana has moderate saving and Okra has insignificant savings.
- GHG emission from goat rearing increases due to increase of number of goats from 3640 in current scenario to 8176 in the project scenario due to GHG emission related to fodder practices and enteric fermentation.
- GHG emission from Okra increases mainly because organic manures are increased by 10 percent and chemical manure is reduced by 10 percent. It is evident that nitrogenous chemical manure like urea is a sink for CO<sub>2</sub> while there is a positive emission due to increase of organic manure.

### 6.10.10 GHG Emission Reduction Strategy

- Promotion of implementation of INM, IPM and utilisation of soil health card for adequacy of moisture content and nutrient management of soil;
- Implement water efficiency management measures to reduce water in irrigation through use of sprinkler irrigation, conservation of water and recycling of water from ETP, rainwater harvesting etc;
- Bring improvement in equipment, machineries for energy efficiency and replace these with efficient 3-5 star rated machineries and equipment;
- Promotion of solar and renewable energy in SMART and discourage use of polluting fuel in agriculture; and
- Measures should be adopted to post harvest losses in storage, transportation and processing.

### 6.10.11 Environmental Management Framework

Environmental Management framework includes mitigation measures for impacts identified in each of the environmental aspects as discussed in the above section. The framework also indicates the value chain where the impact has been identified and it suggest the stages at which the mitigation measure needs to be adopted and the party responsible to undertake the mitigation measure.

Environmental Management Framework (EMF) is as indicated in the table below:

**Table 52: Environment Management Framework**

| Project Interventions                       | Environmental Aspect                        | Environmental Impacts                                                                                                                                                                                                                                                                                                                     | Value Chain              | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Monitoring Responsibility                                                                 | Monitoring Frequency                                                                           |
|---------------------------------------------|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| Production of Agri-commodity by CBOs        | Soil Quality                                | Survey reveals that only 45 – 50 percent farmers are having soil health cards. In the absence of knowledge on soil health, there is possibility that the farmers intent to use excessive fertilizers. This can result in negative impact on soil quality.                                                                                 | Primary Production       | <ul style="list-style-type: none"> <li>IEC material in the form of handbook and brochures shall be prepared and distributed to farmers on importance of having knowledge of soil health and correct usage of fertilizers as per the soil type and crop requirement.</li> <li>Government of India's scheme on soil health card shall be leveraged and the project shall ensure that all the farmers of CBOs supported by SMART shall have soil health card</li> </ul> | SMART / PIU                                                                               | <ul style="list-style-type: none"> <li>Annual by SMART</li> <li>Monthly by PIU</li> </ul>      |
| Production of Agri-commodity by CBOs        |                                             | About 80 – 85 percent of farmers surveyed had indicated that they have received training on usage of pesticides. However, since not all farmers are trained, there is a possibility of contamination of soil due to pesticides and agrochemicals.                                                                                         | Primary Production       | <ul style="list-style-type: none"> <li>Farmers shall be trained via Focused Group Discussion and training programmes on correct dosage, safety precautions, mode of application and timing for pesticides and other agrochemicals.</li> </ul>                                                                                                                                                                                                                        | SMART / PIU                                                                               | <ul style="list-style-type: none"> <li>Annual by SMART</li> <li>Monthly by PIU</li> </ul>      |
| Production of Agri-commodity by CBOs        |                                             | 40 percent farmers have indicated that they are aware of biofertilizers and biopesticides. The use of chemical pesticides and agrochemicals prevails especially in horticulture and cotton farming segments. Farmers have indicated that the price of bio pesticides and bio-fertilizers are high and hence they can't afford to use them | Primary Production       | <ul style="list-style-type: none"> <li>Farmers shall be trained via FGD and training Programmes on use of bio pesticides and bio fertilizers and its benefits.</li> <li>Policy level reforms are required to incentivise production of bio fertilizers and bio pesticides manufacturing units so that they are available to farmers easily at subsidized price.</li> </ul>                                                                                           | SMART / PIU                                                                               | <ul style="list-style-type: none"> <li>Annual by SMART</li> <li>Monthly by PIU</li> </ul>      |
| Processing of agri-commodity by enterprises | Solid Waste Generation and Land-use impacts | Food processing industry generate solid waste in the form of vegetable and fruit waste such as seeds, skin etc and related. It was informed during the survey that                                                                                                                                                                        | Food Processing Industry | <ul style="list-style-type: none"> <li>Food Processing industry supported by the Project shall have valid consent from the Maharashtra state Pollution Control Board (MPCB).</li> </ul>                                                                                                                                                                                                                                                                              | SMART to support village level processing industry and private operators of compost plant | <ul style="list-style-type: none"> <li>Half Yearly by SMART</li> <li>Monthly by PIU</li> </ul> |

| Project Interventions                           | Environmental Aspect | Environmental Impacts                                                                                                                                                                                                   | Value Chain        | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Monitoring Responsibility                                                                                | Monitoring Frequency                                                                           |
|-------------------------------------------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
|                                                 |                      | organic fraction is mostly composted. However, no proper mechanism for waste collection and scientific processing exist.                                                                                                |                    | <ul style="list-style-type: none"> <li>Installation of compost plant with support of SMART. The operation and maintenance shall be done by Food Processing Industry or private operators</li> <li>Solid waste generated shall be segregated at source and organic fraction shall be collected and composted either at individual level or at group level and other inorganic fraction shall be disposed as per the regulations based on the type of waste generated.</li> </ul>                                   | with grants and subsidies<br>PIU                                                                         |                                                                                                |
| Markets                                         |                      | Markets surveyed were also observed to have no proper mechanism of solid waste collection, segregation and scientific processing.                                                                                       | Market             | <ul style="list-style-type: none"> <li>Installation of compost plant with support of SMART. The operation and maintenance shall be done by market operator or private operators</li> <li>Solid waste generated shall be segregated at source and organic fraction shall be collected and composted either at individual level or at group level and other inorganic fraction shall be disposed as per the regulations based on the type of waste generated.</li> </ul>                                            | SMART to support village Markets and private operators of compost plant with grants and subsidies<br>PIU | <ul style="list-style-type: none"> <li>Half Yearly by SMART</li> <li>Monthly by PIU</li> </ul> |
| Slaughterhouse (Expansion and waste management) |                      | Solid waste will be generated due to operation of slaughter house if there are no proper mechanism for waste collection, segregation and scientific disposal                                                            | Slaughter house    | <ul style="list-style-type: none"> <li>Slaughter house to be supported by the Project shall have a valid consent from MPCB and license from FSSAI for operating the plant.</li> <li>Slaughter houses to be supported by the Project shall comply with the Good Industrial Practice for slaughter house as indicated in the report.</li> </ul>                                                                                                                                                                     | SMART Slaughter operators<br>PIU/ house                                                                  | <ul style="list-style-type: none"> <li>Half Yearly by SMART</li> <li>Monthly by PIU</li> </ul> |
| Production of Agri-commodity by CBOs            |                      | Empty containers of chemical fertilizers, pesticides and other agrochemicals are hazardous, and the farmers are not fully aware of the impacts. Farmers have responded that they just openly dispose of the containers. | Primary Production | <ul style="list-style-type: none"> <li>IEC material on mode of disposal of empty containers of pesticides and other agrochemicals shall be prepared and distributed to farmers.</li> <li>Empty containers shall be washed, and the washed water shall be used for dilution of same grade of pesticides and the washed empty containers shall be punctured or rendered unusable for any other purpose</li> <li>Manufacturer and suppliers should be made responsible for providing mechanism to collect</li> </ul> | SMART / PIU                                                                                              | <ul style="list-style-type: none"> <li>Annual by SMART</li> <li>Monthly by PIU</li> </ul>      |

| Project Interventions                           | Environmental Aspect | Environmental Impacts                                                                                                                                                                                                                                                                        | Value Chain               | Mitigation Measures                                                                                                                                                                                                                                 | Monitoring Responsibility                                                                                           | Monitoring Frequency                                                                                                        |
|-------------------------------------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
|                                                 |                      |                                                                                                                                                                                                                                                                                              |                           | the empty containers back under Extended Producer Responsibility                                                                                                                                                                                    |                                                                                                                     |                                                                                                                             |
| Expansion of Agri-infrastructure viz, warehouse |                      | Solid waste generation would be there during any civil construction activities for any proposed expansion of processing related infrastructure/ CBOs / Warehouses / Cold storages during the project implementation stage                                                                    | CBOs / Warehouse / Retail | <ul style="list-style-type: none"> <li>• Solid waste generated during the construction stage shall be managed as per the EMP indicated in the Construction Management Guideline included in the report</li> </ul>                                   | <ul style="list-style-type: none"> <li>• Contractor and its employers</li> <li>• PIU</li> <li>• SMART</li> </ul>    | <ul style="list-style-type: none"> <li>• Continuous</li> <li>• Intermittent by PIU</li> <li>• Quarterly by SMART</li> </ul> |
| Production of Agri-commodity by CBOs            | Water Quality Impact | Ground water and surface water quality can be impacted if the fertilizers and pesticides are not used in correct dosage and at proper time and mode of application. Since not all farmers have responded to obtain adequate training, there are chances of contamination                     | Primary Production        | <ul style="list-style-type: none"> <li>• Farmers shall be trained via Focused Group Discussion and training programmes on correct dosage, safety precautions, mode of application and timing for pesticides and other agrochemicals.</li> </ul>     | SMART / PIU                                                                                                         | <ul style="list-style-type: none"> <li>• Annual by SMART</li> <li>• Monthly by PIU</li> </ul>                               |
| Production of Agri-commodity by CBOs            |                      | Goat and sheep shelter were not adequately clean, hygienic and drained and hence there are chances of surface water contamination                                                                                                                                                            | Back Yard Farming         | Farmers shall be trained via FGD regarding hygienic practices and drainage requirement in goat and sheep shelter and IEC material related to this shall be distributed to farmers.                                                                  | SMART / PIU                                                                                                         | <ul style="list-style-type: none"> <li>• Annual by SMART</li> <li>• Monthly by PIU</li> </ul>                               |
| Processing of agri-commodity by enterprises     |                      | Effluent is also generated from food processing industry in the form of effluent due to cleaning of raw materials, washing of utensils and boiler blow down if applicable. Food processing industries have responded that the effluent generated is treated along with sewage in septic tank | Food Processing Industry  | Project shall support only those Food Processing Units that are having license from FSSAI and consent under Water Act from MPCB. Effluent generated shall be treated and shall be monitored as per the requirements stipulated in the consent order | SMART / PIU to review compliance and Food Processing Industry to have license and consent to establish and operate. | <ul style="list-style-type: none"> <li>• Half Yearly by SMART</li> <li>• Monthly by PIU</li> </ul>                          |
| Slaughterhouse (Expansion and                   |                      | Effluent generation from slaughter houses if not treated properly in                                                                                                                                                                                                                         | Slaughter House           | <ul style="list-style-type: none"> <li>• Slaughter house to be supported by the Project shall have a valid license from FSSAI and Consent under Water Act from MPCB.</li> </ul>                                                                     | SMART / PIU to monitor compliance and                                                                               | <ul style="list-style-type: none"> <li>• Half Yearly by SMART</li> </ul>                                                    |

| Project Interventions                           | Environmental Aspect | Environmental Impacts                                                                                                                                                                                          | Value Chain               | Mitigation Measures                                                                                                                                                                                                                                                                                                                                              | Monitoring Responsibility                                                                | Monitoring Frequency                                                                                                  |
|-------------------------------------------------|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| waste management)                               |                      | ETP can result in contamination of ground and surface water quality                                                                                                                                            |                           | <ul style="list-style-type: none"> <li>Effluent generated shall be treated in ETP</li> <li>Good industrial practice as indicated in the report shall be complied by the Slaughter houses</li> </ul>                                                                                                                                                              | Slaughter House Operator to comply with requirements                                     | <ul style="list-style-type: none"> <li>Monthly by PIU</li> </ul>                                                      |
| Expansion of Agri-infrastructure viz, warehouse |                      | Construction activity during expansion of CBOs / Warehouses / cold storages can also result in generation of waste water in the form of sewage from labour camps and run-off from construction site            | CBOs / Warehouse / Retail | <ul style="list-style-type: none"> <li>Waste water generated during the construction stage shall be managed as per the EMP indicated in the Construction Management Guideline included in the report</li> </ul>                                                                                                                                                  | <ul style="list-style-type: none"> <li>Contractor</li> <li>PIU</li> <li>SMART</li> </ul> | <ul style="list-style-type: none"> <li>Continuous</li> <li>Intermittent by PIU</li> <li>Quarterly by SMART</li> </ul> |
| Production of Agri-commodity by CBOs            | Air Quality Impacts  | In the absence of knowledge on soil quality, there are chances of excessive fertilizer usage by farmers. This can result in emission of N <sub>2</sub> O from heavily fertilized agriculture fields            | Primary Production        | Farmers shall be trained via IEC material and FGD on correct usage of fertilizer based on soil health and crop requirement. Organic manure shall be used in combination of chemical fertilizers.                                                                                                                                                                 | SMART / PIU                                                                              | <ul style="list-style-type: none"> <li>Annual by SMART</li> <li>Monthly by PIU</li> </ul>                             |
| Production of Agri-commodity by CBOs            |                      | Burning of crop residue can result in emission of harmful pollutants such as CO <sub>2</sub> , NO <sub>x</sub> , SO <sub>2</sub> , CO, CH <sub>4</sub> to atmosphere resulting in deterioration of air quality | Primary Production        | CBOs to be supported by the Project shall ensure to reduce crop residue burning by 20 – 30 percent every 2 years. Alternative use of crop residue shall be identified and IEC material for the same shall be prepared by SMART and distributed to farmers                                                                                                        | SMART / PIU<br>CBOs to ensure compliance                                                 | <ul style="list-style-type: none"> <li>Annual by SMART</li> <li>Monthly by PIU</li> </ul>                             |
| Transportation of Agri-commodity                |                      | Air quality is impacted due to emission of NO <sub>x</sub> and particulate matter from vehicles used for transportation of farm produce                                                                        | Transportation            | The Project shall support only Bharath Stage IV and above compliant vehicles with valid PUC certificate to be used for transportation of farm produce                                                                                                                                                                                                            | SMART / PIU                                                                              | <ul style="list-style-type: none"> <li>Annual by SMART</li> <li>Monthly by PIU</li> </ul>                             |
| Processing of agri-commodity by enterprises     |                      | Air Emission from food processing industry due to burning of fuel in boiler, operation of D.G sets or usage of fuel for other processes                                                                        | Food Processing Industry  | Food Processing Industry that shall use D.G set and boilers supported by the Project must have a valid consent from the MPCB under Air Act. Ambient air quality shall be monitored by the industry and shall comply with National Ambient Air Quality Standard. Stack emission shall also be monitored and shall comply with emission levels stipulated by MPCB. | SMART / PIU to monitor compliance                                                        | <ul style="list-style-type: none"> <li>Half Yearly by SMART</li> <li>Monthly by PIU</li> </ul>                        |

| Project Interventions                           | Environmental Aspect  | Environmental Impacts                                                                                                                           | Value Chain               | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Monitoring Responsibility                                                                | Monitoring Frequency                                                                                                  |
|-------------------------------------------------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Production of Agri-commodity by CBOs            |                       | Methane is emitted due to microbial fermentation of feed in the digestive track of goat and sheep                                               | Backyard Farm             | <ul style="list-style-type: none"> <li>IEC material shall be distributed to farmers undertaking back yard farming regarding approach to minimise impact on environment due to goat and sheep rearing.</li> <li>Promote usage of improved cattle feed which reduce emission to the environment</li> <li>Cattle breeds selected shall have better climate adaptability.</li> <li>Selection of feed additives that will inhibit the microorganism that produce methane in the rumen and subsequently reduce methane emission. Some of the feed supplements are tannins, seaweeds, fats and oils etc.</li> </ul> | SMART / PIU                                                                              | <ul style="list-style-type: none"> <li>Annual by SMART</li> <li>Monthly by PIU</li> </ul>                             |
| Expansion of Agri-infrastructure viz, warehouse |                       | Air quality is also impacted due to usage of construction machineries during construction of new warehouse / cold storage/ expansion activities | CBOs / Warehouse / Retail | <ul style="list-style-type: none"> <li>Emission during the construction stage shall be managed as per the EMP indicated in the Construction Management Guideline included in the report</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                           | Contractor and its employers                                                             | <ul style="list-style-type: none"> <li>Continuous</li> <li>Intermittent by PIU</li> <li>Quarterly by SMART</li> </ul> |
| Expansion of Agri-infrastructure viz, warehouse | Noise Quality Impacts | Noise quality impact during construction stage of warehouse or other facilities due to operation of machineries                                 | CBOs / Warehouse / Retail | <ul style="list-style-type: none"> <li>Noise level during the construction stage shall be managed as per the EMP indicated in the Construction Management Guideline included in the report</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                        | Contractor and its employers                                                             | <ul style="list-style-type: none"> <li>Continuous</li> <li>Intermittent by PIU</li> <li>Quarterly by SMART</li> </ul> |
| Markets                                         |                       | Noise pollution due to operation of D.G sets from warehouse, markets and retails                                                                | CBOs / Warehouse / Retail | Facilities supported by the Project if having a D.G set shall have proper acoustic enclosure to minimize noise impact                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | SMART / PIU to monitor compliance and Operator of the CBOs / Market to ensure compliance | <ul style="list-style-type: none"> <li>Half Yearly by SMART</li> <li>Monthly by PIU</li> </ul>                        |
| Processing of agri-commodity by enterprises     |                       | Noise pollution due to operation of equipment in the food processing industries                                                                 | Food Processing Industry  | Food Processing industry to be supported by the project shall have consent from MPCB and measures as stipulated in the consent for noise level control shall be complied                                                                                                                                                                                                                                                                                                                                                                                                                                     | SMART / PIU to monitor compliance and Operator of the                                    | <ul style="list-style-type: none"> <li>Half Yearly by SMART</li> <li>Monthly by PIU</li> </ul>                        |

| Project Interventions                | Environmental Aspect              | Environmental Impacts                                                                                                                    | Value Chain        | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                      | Monitoring Responsibility     | Monitoring Frequency                                                                      |
|--------------------------------------|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------------|
|                                      |                                   |                                                                                                                                          |                    |                                                                                                                                                                                                                                                                                                                                                                                          | Industry to ensure compliance |                                                                                           |
| Production of Agri-commodity by CBOs | Bio diversity and Natural Habitat | Chemical pesticides if not proven for the target pest can be harmful to other organism dwelling in the farm lands                        | Primary Production | <ul style="list-style-type: none"> <li>Farmers shall be trained via FGD and training module on IPM practices and Pesticide use shall be allowed only as the last resort if the damage is likely to attain Economic Threshold Level (ETL).</li> <li>CBOs to be supported by the Project shall ensure procurement of pesticides if required as per IPM from licensed suppliers.</li> </ul> | SMART / PIU                   | <ul style="list-style-type: none"> <li>Annual by SMART</li> <li>Monthly by PIU</li> </ul> |
| Production of Agri-commodity by CBOs |                                   | Chemical fertilizers and pesticides if used just prior to sudden rain fall can result in run-off causing impact on the aquatic ecosystem | Primary Production | <ul style="list-style-type: none"> <li>IEC material shall be prepared on correct usage of pesticides and other agrochemicals and shall be distributed among farmers to create awareness</li> </ul>                                                                                                                                                                                       | SMART / PIU                   | <ul style="list-style-type: none"> <li>Annual by SMART</li> <li>Monthly by PIU</li> </ul> |
| Production of Agri-commodity by CBOs |                                   | Impact due to open grazing of goat and sheep in forest land                                                                              | Back yard Poultry  | <ul style="list-style-type: none"> <li>Back yard farming CBOs of Poultry to be supported by the Project should ensure shelter feeding of goat and sheep.</li> <li>Forest grazing will not be supported by the project.</li> </ul>                                                                                                                                                        | SMART / PIU                   | <ul style="list-style-type: none"> <li>Annual by SMART</li> <li>Monthly by PIU</li> </ul> |
| Production of Agri-commodity by CBOs | Impacts of banned pesticides      | Impact due to use of banned pesticides as per Indian Regulation and WHO guideline                                                        | Primary Production | <ul style="list-style-type: none"> <li>Training of farmers of CBO supported by SMART and staffs and officers of PIU and PCMU.</li> <li>IEC material shall be prepared indicating the list of banned pesticides as per WHO and Indian regulation and shall be distributed among farmers to create awareness.</li> </ul>                                                                   | SMART / PIU                   | <ul style="list-style-type: none"> <li>Annual by SMART</li> <li>Monthly by PIU</li> </ul> |
| Production of Agri-commodity by CBOs | Farmers Health and Safety         | Health hazard due to farm machineries, hand tools and other sources such as snake bites, animal bites, fall, heat stroke etc             | Primary Producers  | <ul style="list-style-type: none"> <li>Farmers shall be well trained via distribution of IEC material.</li> <li>Adequate personal protection equipment shall be used while farming.</li> </ul>                                                                                                                                                                                           | SMART / PIU                   | <ul style="list-style-type: none"> <li>Annual by SMART</li> <li>Monthly by PIU</li> </ul> |
| Production of Agri-commodity by CBOs |                                   | Health Hazard due to Pesticides and other agrochemicals without adequate personal protection equipment                                   | Primary Producers  | <ul style="list-style-type: none"> <li>Farmers shall be trained on the dosage, mode of application, mixing techniques and spraying methods of pesticides with usage of proper</li> </ul>                                                                                                                                                                                                 | SMART / PIU                   | <ul style="list-style-type: none"> <li>Annual by SMART</li> <li>Monthly by PIU</li> </ul> |

| Project Interventions                           | Environmental Aspect        | Environmental Impacts                                                                                  | Value Chain                                                 | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Monitoring Responsibility                                  | Monitoring Frequency                                                                           |
|-------------------------------------------------|-----------------------------|--------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------------------------------------------|
|                                                 |                             |                                                                                                        |                                                             | personal protection equipment like mask, aprons, gloves etc.                                                                                                                                                                                                                                                                                                                                                                                                             |                                                            |                                                                                                |
| Production of Agri-commodity by CBOs            | Consumers Health and Safety | Impact due to pesticides and other agrochemical residue left in the food beyond the MRL level          | Primary Producers                                           | <ul style="list-style-type: none"> <li>CBOs to be supported by the Project to ensure MRL level as per <a href="#">FSSAI guideline for in their farm produce</a></li> <li><a href="#">Food safety testing facility for MRL levels</a> shall be provided at regional level.</li> </ul>                                                                                                                                                                                     | SMART / PIU                                                | <ul style="list-style-type: none"> <li>Annual by SMART</li> <li>Monthly by PIU</li> </ul>      |
| Production of Agri-commodity by CBOs            |                             | Impact due to vaccination, hormones and artificial insemination                                        | Primary Producers                                           | <ul style="list-style-type: none"> <li>Farmers shall be sensitized via training and workshops regarding the ill-effect of hormone injection.</li> <li>Practice of injection of hormones must be avoided.</li> <li>Farmers shall be trained on hygienic milking practices</li> <li>Indigenous species should be promoted for artificial insemination and shall be done in consultation with a technician</li> </ul>                                                       | SMART / PIU                                                | <ul style="list-style-type: none"> <li>Annual by SMART</li> <li>Monthly by PIU</li> </ul>      |
| Slaughterhouse (Expansion and waste management) |                             | Unhygienic practices in poor slaughter houses                                                          | Slaughter house                                             | <ul style="list-style-type: none"> <li>Slaughter houses must have a valid license to operate.</li> <li>Consent shall be obtained from State Pollution Control Board for operating the slaughter house.</li> <li>Slaughter house to be supported by the project to ensure compliance with Good Industrial Practice for slaughter house included in the report.</li> </ul>                                                                                                 | SMART / PIU to provide training and monitor implementation | <ul style="list-style-type: none"> <li>Half Yearly by SMART</li> <li>Monthly by PIU</li> </ul> |
| Processing of agri-commodity by enterprises     | Energy Conservation         | There is scope for improvement on usage of energy conservation measures in the agriculture value chain | Primary producers, FPOs/FPCs, Market / traders / retailers. | <p>CBOs / Markets / other facilities supported under the Project shall ensure adopting the following:</p> <ul style="list-style-type: none"> <li><a href="#">Energy efficient measures such as usage of LED lighting shall be encouraged.</a></li> <li>Building designs shall be such as to utilize maximum daylight rather than relying on artificial light.</li> <li>Retails shall adopt high efficiency HVAC system which has potential for energy saving.</li> </ul> | SMART / PIU                                                | <ul style="list-style-type: none"> <li>Half Yearly by SMART</li> <li>Monthly by PIU</li> </ul> |

| Project Interventions                | Environmental Aspect   | Environmental Impacts                                                                                  | Value Chain    | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Monitoring Responsibility                      | Monitoring Frequency                                                                      |
|--------------------------------------|------------------------|--------------------------------------------------------------------------------------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------|
|                                      |                        |                                                                                                        |                | <ul style="list-style-type: none"> <li>Refrigeration system used in retail and cold storages shall be of 3 - 5 energy star rating.</li> <li>Food processing industries shall adopt technologies such as solar dryers as measure for energy conservation.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                |                                                |                                                                                           |
| Production of Agri-commodity by CBOs | Climate Change Impacts | Impact on agriculture due to climate change such as yield loss, loss of crop due increased temperature | Complete value | <ul style="list-style-type: none"> <li>IEC material should be distributed among farmers and FGD must be conducted to train farmers to change farming practices to conserve soil moisture, organic matter and nutrients such as use mulch stubble and straw, crop rotation, use lower plant density, change timing of farm operations and advance sowing dates to offset moisture stress during warm period.</li> <li>CBOs to be supported by the Project shall ensure procurement of <b>certified seeds and purchase of pesticides from licensed suppliers.</b></li> <li>Reducing post harvesting food loss by improved storage and handling mechanism.</li> </ul> | SMART / PIU to provide training and assistance | <ul style="list-style-type: none"> <li>Annual by SMART</li> <li>Monthly by PIU</li> </ul> |
| Production of Agri-commodity by CBOs |                        | Impact of agriculture on climate change                                                                | Complete value | <ul style="list-style-type: none"> <li>Adopting improved cropland management practices such as <b>INM to reduce emission</b> from soil.</li> <li>Backyard farming CBOs supported by the project shall ensure adopting Improving livestock feeding practices by using specific agents or dietary additives, improvement in forage quality and quantity which can increase efficiency.</li> <li>Improving soil and water management by increasing soil availability in the root zone and improving soil organic matter.</li> </ul>                                                                                                                                   | SMART / PIU to provide training and assistance | <ul style="list-style-type: none"> <li>Annual by SMART</li> <li>Monthly by PIU</li> </ul> |

### 6.10.12 Certification of INDGAP

To enable farm produce to be internationally competitive, innovative farming practices incorporating the concept of globally accepted Good Agricultural Practices (GAP) within the framework of commercial agricultural production for long term improvement and sustainability is essential. GAP in addition to improving the yield and quality of the products, also has environmental and social dimensions. Implementation of GAP would promote optimum utilization of water resources such as pesticides, fertilizers, water and eco-friendly agriculture. Its social dimension would be to protect the agricultural workers' health from improper use of chemicals and pesticides. It is a particularly opportune time to promote GAP when second generation of reforms in agriculture which would have a Critical impact on Indian agriculture, are planned by the Indian Government.

The Indian Good Agricultural Practices (INDGAP) considers not only the quality and quantity of the produce obtained from a unit area but it also takes care of integrating preharvest practices like soil & water management, nutrient management and pest management, harvesting, post-harvest handling and other logistics. It is therefore necessary to have a comprehensive view while defining control and compliance systems for different farm produce covering horticulture, floriculture, food grains, etc. The areas where appropriate control measures need to be strengthened are farms producing raw material such as food grains, fresh fruits and vegetables, floriculture, etc. to ensure sustained supply of produce of the desirable quality.

With the opening of the world market, there is a flow of trade in these agricultural products. It is, therefore, necessary to define certain minimum standards with a well-defined certification and accreditation mechanism for the implementation of INDGAP to facilitate national and international trade in farm produce. Implementation of INDGAP is voluntary and non-discriminatory to the growers.

The certification of INDGAP involves verification system by the Quality Council of India (QCI) or agency authorised by QCI. The verification system includes criteria includes critical point and major point. The Critical Points and Compliance Criteria required to be followed by the grower or a grower group as well as by the certification bodies for verification purposes. Criteria marked as Major are those, which are recommended for implementation and are advisory in nature.

The proposed arrangement for the certification of INDGAP is given below:

**Table 53: Proposed arrangement for INDGAP certification**

| Agency | Role                                                                                                   |
|--------|--------------------------------------------------------------------------------------------------------|
| SMART  | SMART shall support CBOs to obtain the INDGAP certification with finance and management system support |
| CBOs   | CBOs to obtain and comply with verification process of INDGAP certification.                           |

### 6.10.13 Capacity Building plan

As indicated in the table above, the indicative capacity building plan for the project to mitigate the risks identified are presented in the following:

**Table 54: Capacity Building**

| Identified gaps                                                                | Measures                                                                                                              | Responsibility                                     |
|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| Expertise-<br>Absence of<br>environmental and<br>social specialists in<br>PIUs | Environmental Specialists                                                                                             | Recruitment at PCMU level and respective PIU level |
|                                                                                | Social specialist                                                                                                     | Recruitment at PCMU level and respective PIU level |
| Environmental and<br>social capacity                                           | Training on <ul style="list-style-type: none"> <li>● Environmental safeguards</li> <li>● Social safeguards</li> </ul> | Training of PCMU staffs<br>Training of PIU staffs  |

| Identified gaps | Measures                                                                                                                                                                                             | Responsibility                                                                             |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
|                 | <ul style="list-style-type: none"> <li>• Pest management plan</li> <li>• Gender Sensitisation</li> <li>• Good industrial practices for slaughter house</li> <li>• Construction Management</li> </ul> |                                                                                            |
| Awareness       | <ul style="list-style-type: none"> <li>• Preparation and development of IEC material;</li> <li>• Community and media campaigning</li> </ul>                                                          | SMART to develop IEC material for campaigning<br>Organise stakeholder's awareness programs |

**Table 55: Capacity building plan for Social Safeguard**

| Workshops/ Training         | Level    | Description                                                                                                                                                                                      | Year    | Responsibility                                                                                            |
|-----------------------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------------------------------------------------------------------------------------------------------|
| Social Management Framework | State    | Training of PCMU & PIU staff on social assessment, land resettlement, labor management framework indigenous people plan, citizen engagement, grievance Redressal, inclusion strategy)            | 1 & 3   | PCMU/State Social Safeguard Specialist                                                                    |
| Social Management Framework | Regional | Training of PIU regional and DIU staff on social assessment, land resettlement, labour management framework indigenous people plan, citizen engagement, grievance Redressal, inclusion strategy) | 1 & 3   | PCMU/State Social Safeguard Specialist/Regional Social Safeguard Specialist                               |
| Social Management Framework | District | Training of CBOs on land resettlement, labour management framework indigenous people plan, citizen engagement, grievance Redressal, inclusion strategy                                           | 1,2,3,4 | PCMU/State Social Safeguard Specialist/Regional Implementation Unit/ Regional Social Safeguard Specialist |

## 6.11 Training and Capacity Building Schedule

Training and capacity building schedule are as indicated in the table below:

| Sr No.                                                                                                                                                                                                             | Proposed Activity                                                                                                                                        | Year for Training                       | Responsibility                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|--------------------------------|
| <b>Component B: Supporting Enterprise Growth and Expanding Market Access Subcomponent 4- Technical Trainings and Extension activities for value chain development by PIUs in catchment areas of PPs &amp; MAPs</b> |                                                                                                                                                          |                                         |                                |
| 1.                                                                                                                                                                                                                 | B.1: Weekly training to Farmers through the Farmer Field Schools under Subcomponent 4.1. PIU, Agriculture; Value Chain Development Schools - Field Crops | 01 <sup>st</sup> -04 <sup>th</sup> Year | PIU-Agriculture                |
| 2.                                                                                                                                                                                                                 | B.1: Training on GAP / Organic, Traceability and Food Safety Under Subcomponent 4.2. Value Chain Development Schools - Horticulture                      | 01 <sup>st</sup> -04 <sup>th</sup> Year | PIU- Agriculture/Horticulture  |
| 3.                                                                                                                                                                                                                 | B.1: Training on Market Led Crops Demos for GAP Certifications, Organic Certifications, Traceability                                                     | 01 <sup>st</sup> -04 <sup>th</sup> Year | PIU- Agriculture/ Horticulture |
| 4.                                                                                                                                                                                                                 | B.1: Training to Farmers through the Farmer Field Schools under Subcomponent 4.2 Value Chain Development Schools – Horticulture                          | 01 <sup>st</sup> -04 <sup>th</sup> Year | PIU- Agriculture/ Horticulture |
| 5.                                                                                                                                                                                                                 | B.1: Training on Quarantine Pest Free Cluster Development Program under Subcomponent 4.2 Value Chain Development Schools – Horticulture                  | 02 <sup>nd</sup> -04 <sup>th</sup> Year | PIU- Agriculture/ Horticulture |
| 6.                                                                                                                                                                                                                 | B.1: Training on Good Animal Husbandry Training for Farmers under Subcomponent 4.3 PIU AHD for Small Ruminants & Backyard Poultry                        | 01 <sup>st</sup> -05 <sup>th</sup> Year | PIU- Animal Husbandry          |

| Sr No. | Proposed Activity                                                                                                                                                                                                                  | Year for Training                       | Responsibility                        |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|---------------------------------------|
| 7.     | B.1: Training of Community Cadre (Krishisakhi, Pashusakhi, Community Agriculture Manager, Community Livestock Manager) on GAP, Food Safety and Traceability under Cost of Training for Bridging Technical Support for CLFs & CMRCs | 02 <sup>nd</sup> -04 <sup>th</sup> Year | PIU- Agriculture/<br>Animal Husbandry |
| 8.     | B3: Urban Food Pilot. Awareness Campaigns & Training by PMC to goat farmers on GHP and butcher & enterprises on quality certification, GMP, HACCP, FSMS, ISO 22000, SPS                                                            | 01 <sup>st</sup> -04 <sup>th</sup> Year | PIU- Animal Husbandry                 |
| 9.     | Hiring of the 08 Nos. of Environmental Safeguard Officers at the Regional (JDA) Level                                                                                                                                              |                                         |                                       |
| 10.    | Publication of IEC Material                                                                                                                                                                                                        |                                         |                                       |
| 11.    | Video Film/Documentary on Best Practices                                                                                                                                                                                           |                                         |                                       |
| 12.    | Midterm and End-term Audits                                                                                                                                                                                                        |                                         |                                       |
| 13.    | Software, Equipment's, Database, etc.                                                                                                                                                                                              |                                         |                                       |

## 6.12 Environmental Monitoring indicators

The Project Development Objective (PDO) of SMART is to support the development of inclusive and competitive agriculture value chains, focusing on small holder farmers & Agri-entrepreneurs in Maharashtra. Environmental Safeguard of SMART assesses the possible environmental risks and the impacts (positive or negative) associated with the developmental interventions. The ESMF suggested by SMART would define measures and processes during the project design and implementation to effectively manage risks and enhance positive impacts.

For integration of environment safeguards along the selected agriculture value chains, project will strive to achieve 15-20 percent resource use efficiency (reduce, reuse and recycle) from the baseline scenario. The environment safeguards inclusive approach will focus on adoption of precision farming practices for the use of Agri-inputs, safe disposal of pesticide containers, adoption of renewable energy (solar, biogas), waste reduction and its conversion into value added products, foster food safety aspects through GAP/MRL compliance, reduction of GHG emission's across the selected Agri-value chains, creation of sustainable agriculture jobs and mainstreaming of environmental considerations into the State's agricultural policies.

The component and activity wise Environment Safeguards Integration Plan could be suggested as below:

### 6.12.1 Environment Safeguards Integration Matrix

**Table 56: Environment Safeguard Integration Matrix**

| Component                                                     | Activity                                                                               | Environment Safeguards Integration                                                                                               | Output Indicator                                           | Outcome                                                                                                                                        |
|---------------------------------------------------------------|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| A. Enhancing Institutional Capacity for Agribusiness Reforms. | A.1 Support for research and technical assistance to GOM on agriculture reform program | Training of staff of the State Line Departments (All PIUs) on MRL/GAP/Sustainable agriculture/Waste management/ Renewable energy | Agency wise # staff trained                                | Agency wise Increase in awareness among staff of State Line Departments on MRL/GAP/Sustainable agriculture/ waste management/ renewable energy |
|                                                               | A.2 Establishing Agribusiness Stewardship                                              | Integration of Environmental Stewardship for CBOs under ASCs, Food                                                               | # of CBOs linked with Environmental Stewardship under ASCs | No of PPs & MAPs of the CBOs linked with Environmental Stewardship under ASCs, Food safety,                                                    |

| Component                                                   | Activity                                                                             | Environment Safeguards Integration                                                                                                                                                                                                                                     | Output Indicator                                                                                                                               | Outcome                                                                                                                                        |
|-------------------------------------------------------------|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                             | Councils (ASCs)                                                                      | safety, worker's safety and community safety.                                                                                                                                                                                                                          |                                                                                                                                                | worker's safety and community safety.                                                                                                          |
| B: Supporting Enterprise Growth and Expanding Market Access | B. 1 Market Access Support. (PP, MAP and Innovations                                 | Capability Building of the CBOs (FPCs, CLFs, CMRCs and PACS) under PP, MAP and CMA on Climate Resilient Agriculture Technologies through the third part agencies, viz., NIASM, Baramati (TBD), Vanamati and Ramati (TBD).<br>Certification Requirement like GAP, HACCP | Number of Demonstrations on Climate Resilient Agriculture Technologies provided to the CBOs                                                    | No. of CBOs adopting the Climate Resilient Agriculture Technologies;<br>Area of CBO certified under GAP<br>Slaughter house certified as HACCP. |
|                                                             |                                                                                      | Provision of the Implements/technologies to CBOs for the bringing New/Additional Area in Hectares under Climate Resilient Agriculture                                                                                                                                  | Nos of the Implements / technologies supplied to the CBOs for the bringing New/Additional Area in Hectares under Climate Resilient Agriculture | New/Additional Area in Hectares brought Under Climate Resilient Agriculture using the Implements                                               |
|                                                             |                                                                                      | Promotion of Climate Resilient Fodder Production                                                                                                                                                                                                                       | No of Climate Resilient Fodder Production units demonstrated/established to the CBOs                                                           | No of Climate Resilient Fodder Production developed and used by the CBOs                                                                       |
|                                                             |                                                                                      | Promotion of Renewable Energy (Solar) /Energy Efficiency for the Warehouses                                                                                                                                                                                            | Support for adoption of Renewable Energy (Solar) /Energy Efficiency technologies provided to the CBOs                                          | No of Renewable Energy (Solar) /Energy Efficiency technologies deployed/ used by the CBOs                                                      |
|                                                             | B. 2. Support Enterprise Development                                                 | Setting up of Agri-waste management units for Production and Processing                                                                                                                                                                                                | Nos. of trainings conducted for the CBOs in waste to wealth conversion technologies and establishment of Composting Units/Related Technologies | No of Composting units developed and used by the CBOs                                                                                          |
|                                                             |                                                                                      | Development of Green/Sustainable Jobs                                                                                                                                                                                                                                  | Nos. of trainings conducted for the CBOs in Sustainable Agricultural Practices (GAP/IPM/INM)                                                   | Nos. of Green/Sustainable Jobs created through the project's CBOs                                                                              |
|                                                             | B.3 Access to Finance                                                                | Training and Capacity building for formulating viable bank proposals for accessing finance for Sustainable Agriculture                                                                                                                                                 | # of CBOs trained on accessing finance for adoption of Sustainable Agriculture                                                                 | Increase in the capacity of CBOs on accessing finance for Sustainable Agriculture                                                              |
| B.4 Urban Food Pilot                                        | Training and Capacity building of CBOs on GAP & its Certification and MRL Compliance | # of CBOs trained on GAP & its Certification and MRL Compliance                                                                                                                                                                                                        | No. of farmers reached with GAP certification and training on safe food                                                                        |                                                                                                                                                |
| C. Building Risk Mitigation and Management                  | C. 1 Enhanced market information and intelligence services                           | Dissemination of information to CBOs on Climate Resilient Technologies (mobile SMS) for Agriculture and Livestock Value Chains                                                                                                                                         | # of CBOs received the information on Climate Resilient Technologies                                                                           | Increased access of CBOs to information on Climate Resilient Technologies                                                                      |
|                                                             | C. 2 Strengthening the warehouse receipts systems (Needs to be                       | Promotion of Renewable Energy/Energy Efficiency for the Warehouses                                                                                                                                                                                                     | # of Warehouses deploying the Renewable (Solar) Energy /Energy Efficiency                                                                      | Number of Warehouses using the Renewable (Solar) Energy/ Energy Efficiency                                                                     |

| Component                                     | Activity                           | Environment Safeguards Integration                                                                                                                                                                                                                                                                    | Output Indicator                                                                                                                         | Outcome                                                                                                                                       |
|-----------------------------------------------|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
|                                               | Linked to Renewable (Solar) Energy |                                                                                                                                                                                                                                                                                                       |                                                                                                                                          |                                                                                                                                               |
|                                               | C3. Price Risk Management          | None                                                                                                                                                                                                                                                                                                  | None                                                                                                                                     | None                                                                                                                                          |
| D. Project Management Monitoring and Learning | Project Management                 | Staffing requirement; Environmental Capacity of Staffs; Promotion of Environmental Stewardship for the SMART Project's Management- HR Policy favouring use of Car Pooling of Staff, Use of Reusable Products, whenever feasible, conducting review meeting through Video Conferencing Platforms, etc. | Nos. of Training's conducted for the SMART's PCMU team and related stakeholders on adoption of the Environmental Stewardship under SMART | Nos. of SMART's PCMU staff or CBOs showcasing Environmental Stewardship                                                                       |
|                                               |                                    | GHG Foot print of the Agri- Value chain commodities                                                                                                                                                                                                                                                   | No of Agri-commodities Value chains evaluated for GHG Emission Reductions                                                                | No of Agri-commodities Value chains with reduced GHG Emissions                                                                                |
|                                               | MIS and M&E                        | Publication of IEC material on Sustainable Agricultural Practices and Climate Resilience Building Measures                                                                                                                                                                                            | No. of beneficiaries/CBOs receiving IEC Material through the SMART project                                                               | No. of beneficiaries/CBOs using the IEC Material supplied by the SMART project for improving the sustainable agricultural production systems. |
|                                               |                                    | Promotion of real time monitoring of the SMART project's interventions using mobile, tablet devices                                                                                                                                                                                                   | No. of beneficiaries/CBOs trained in Promotion of real time monitoring of the SMART project's interventions                              | No. of beneficiaries /CBOs reporting progress using Smart Mobile Phones/ Tablets / Geotagged Photographs                                      |

Source: Mott MacDonald Analysis

**Implementation Responsibility:** Implementation of Environment Safeguards Integration Matrix along the SMART's project cycle will be the collective responsibility of all the project stakeholders. The SMART PCMU will be responsible for coordination and monitoring of the Environment Management Plan across PIUs and DIUs.

### 6.13 Monitoring Indicators for Social Development Outcomes

Monitoring indicators have been developed for each of the components encompassing core indicators on equity in participation and benefits to women, marginalised community groups and small-scale players in the value chain. A baseline (pre -project status) scenario for each indicator shall be developed under the Project. These indicators shall be monitored internally as well as externally on a periodic basis and reviewed by the SMU.

**Table 57: Monitoring indicators for Social Development Outcomes**

| Project Component                                                          | Indicator                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A. Enhancing Institutional Capacity to support agricultural Transformation | <ul style="list-style-type: none"> <li>● Number of female officials of partnering agencies trained</li> <li>● Number of SC and ST officials of partnering agencies trained</li> <li>● Number of investment policy dialogue organised between SC and ST entrepreneurs and groups and private investors</li> </ul> |

| Project Component                                           | Indicator                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| B: Expanding Market Access and Supporting Enterprise Growth | <ul style="list-style-type: none"> <li>● Number of investment policy dialogue organised between economically weaker entrepreneurs and groups and private investors</li> <li>● Increase in volume of business due to increased investments in the concerned value chain activities</li> <li>● Number of small and marginal farmers, ST/SC included in identified production clusters, FPCs</li> <li>● No. of women farmers included in production clusters, FPCs</li> <li>● Involvement of small, marginal, ST/SC and women farmers in management of FPCs</li> <li>● No. of training organized on skill up-gradation on use of new technology</li> <li>● No. of ST/SC, women labourers participated in the training</li> <li>● Number of women entrepreneurs facilitated</li> <li>● Number of entrepreneurs belonging to ST/SC category facilitated</li> <li>● Number of entrepreneurs belonging to economically weaker sections facilitated</li> <li>● Number of ST and SC entrepreneurs provided exposure trips</li> <li>● Number of female entrepreneurs provided exposure trips</li> <li>● Impact on price of the commodities due to storage facility</li> <li>● Trade mark obtained by female, SC, ST entrepreneurs and groups and increase in volume of business</li> <li>● Involvement of small and marginal farmers in market management/decision making bodies</li> <li>● Involvement of women in market management/decision making bodies</li> <li>● Involvement of ST and SC in market management/decision making bodies</li> <li>● Increase in investments in activities of ST/SC, small, women entrepreneurs</li> <li>● Increase in flow of agricultural commodities of the ST/SC, women farmers to markets</li> <li>● production clusters</li> <li>● Number of small and marginal, ST/SC farmers using climate resilient Package of Practices.</li> <li>● Number of small and marginal, ST/SC farmers benefitted due to increase in value of the farm produces</li> <li>● Engagement of women labourers in construction works</li> <li>● Increase in number of bank account holders among small and marginal/women and ST/SC farmers</li> <li>● Proportion of farmer members (small and marginal, women, ST/SC) –with formal sources of credit vis-à-vis informal sources</li> <li>● Credit flow to the small/ women, ST/SC entrepreneurs</li> </ul> |
| C: Building Risk Mitigation Mechanisms                      | <ul style="list-style-type: none"> <li>● Local wages/person days generated in the markets for loading and unloading of commodities</li> <li>● Percentage of increase in profit margin of the farmers due to new price discovery system</li> <li>● Increase in volume of business due to modernisation and up-gradation of markets</li> <li>● Price realized by farmers for the relevant commodity</li> <li>● Number of small and marginal farmers, ST/SC and women farmers using warehouses</li> <li>● Number of negotiable warehouse receipts issued to small and marginal farmers, ST/SC and women farmers</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

## 6.14 Food Safety Strategy

The findings of food safety assessment are given below.

- Based on MRL testing data sourced from Maharashtra Agricultural Department, 16 commodities have been found to be above the MRL.
- Lack of formal education on food safety
- Lack of awareness towards GAP (Good Agricultural Practices), Food safety practices
- Lack of enough resources to make farmers aware of food safety.
- Lack of government laboratories to test all the required parameters.
- Poor knowledge of personal hygiene.
- A weak policy & regulatory framework
- Inadequate enforcement of existing standards
- Predominance of small farms.

Food Safety Strategy developed for the Project is as indicated below.

**Table 58: Food Safety Strategy**

| Strategy                                                                                                              | Recommended Action                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Avoiding chemical residue in Agriculture Produce                                                                      | <p>Training on INM and IPM practices to be delivered to the members of the CBOs to be supported by the Project.</p> <p>CBOs to be supported by the Project should ensure that the pesticide residue in their produce is below MRL level set by FSSAI.</p> <p>The buyers and enterprises shall monitor the MRL level and submit copy of the test report to SMART.</p>                                                                                                                                                                                                                                           |
| Avoiding antibiotics and steroid in Goat and chicken meat.                                                            | The Enterprise or buyers will conduct sampling for testing of MRL of antibiotics and steroids by a third party or independent laboratories certified by FSSAI. Regular test report will be submitted by the buyers to SMART.                                                                                                                                                                                                                                                                                                                                                                                   |
| Comply with CODEX standard developed by Food and Agricultural Organization for fruits, vegetables, cereals and pulses | <p>IEC material on CODEX for commodity selected by the Project should be developed and distributed to CBOs to be supported by SMART. The IEC material on CODEX shall include the following for the selected agri-commodity.</p> <ul style="list-style-type: none"> <li>● Provisions concerning quality or essential composition and quality factors</li> <li>● Contaminants permissible such as heavy metals and pesticide residue</li> <li>● Hygiene practices and testing parameters</li> <li>● Packing requirements</li> <li>● Labelling requirements</li> <li>● Method of analysis and sampling</li> </ul> |
| Risk communication and health promotion / education in support of foodborne disease prevention                        | <ul style="list-style-type: none"> <li>● Advocate and ensure that the result of scientific assessment is communicated among stakeholders to be supported</li> <li>● Use research to inform policy formulation and proceed with expanding export abilities and improvement of the status of national product in the local market.</li> <li>● Empower women through food safety education</li> </ul>                                                                                                                                                                                                             |

Source: MM Analysis

## 6.15 Monitoring Plan

Based on the monitoring requirement identified during review of stakeholder consultation, key issues and action points identified in the ESMF, a monitoring plan has been prepared as indicated below.

**Table 59: Environmental Monitoring Plan**

| Environmental Aspects                                                                                            | Performance indicator                                                                                            | Monitoring parameters                                                                                      | Frequency                                                                                                                              | Responsibility                                 |
|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| Soil quality impact due to excessive use of fertilizers                                                          | 100 percent farmers of the CBOs supported by SMART are having soil health card within 2 years of implementation. | Farmers of the CBOs supported by SMART having soil health card.                                            | PCMU to monitor quarterly and PIU to monitor monthly.                                                                                  | SMART PCMU and PIU                             |
| Prohibiting banned pesticides<br>Maximum Residue Level of Pesticides in the Farm Produce as per FSSAI standards. | Concentration and presence of Pesticides in the farm produce at CBO level                                        | Laboratory testing of farm produce for presence of banned pesticides, maximum residue level of pesticides. | Continuous monitoring by CBOs prior to entry of farm produce in the CBOs; monthly monitoring by PIUs and Quarterly monitoring by PCMU. | CBO, SMART PCMU, PIU and Enterprises or buyers |
| Energy conservation measures                                                                                     | Use of solar power in CBOs/FPOs/FPCs.                                                                            | Energy rating of equipment and machineries.                                                                | PIU to monitor monthly and PCMU to monitor semi-annually.                                                                              | SMART PCMU and PIU                             |

| Environmental Aspects                  | Performance indicator                                                                                                                | Monitoring parameters      | Frequency                                             | Responsibility     |
|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-------------------------------------------------------|--------------------|
| Emission of Ozone depleting substances | Cold storages and retails adopting HCFC and HFC instead of CFC as per Ozone Depleting Substance (Regulation and Control) Rule, 2014. | Parameters of HCFC and HFC | PCMU to monitor quarterly and PIU to monitor monthly. | SMART PCMU and PIU |

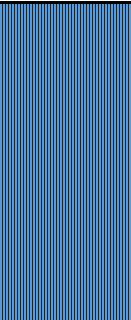
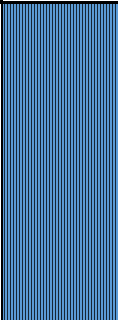
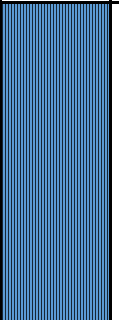
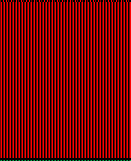
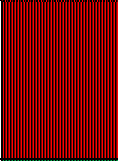
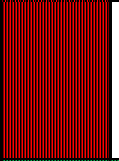



## 6.16 Environmental and Social Budget

Social management budget of **INR 4,73,00,000 /-** including training capacity building of CBOs, development of IEC material and third party audits.

**Table 60: Tentative Social Budget and Capacity Building Timeline Gantt Chart**

| Workshops/ training                                                                                                                    | No of participants       | Unit Cost | Total Cost in INR |
|----------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------|-------------------|
| Social Management Framework at state level                                                                                             | 50*2=100                 | 2,000     | 2,00,000          |
| Social Management Framework at Regional level                                                                                          | 250*2=500                | 2000      | 1000,000          |
| Social Management Framework at district level                                                                                          | 1000 CBO * 5<br>BoD=5000 | 1500      | 75,00,000         |
| IEC                                                                                                                                    |                          |           | 25,00,000         |
| Human Resource: 8 Social Development Experts will be hired by Agriculture PIU at divisional level. One Expert @ 50,000@ month Resource |                          |           | 3,36,00,000       |
| Midterm and End term audit                                                                                                             |                          |           | 25,00,000         |
| Total                                                                                                                                  |                          |           | 4,73,00,000       |

Capacity Building Timeline Gantt Chart for Social and Gender Inclusion

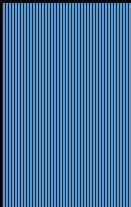
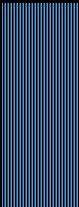
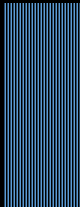
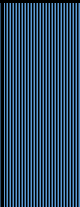
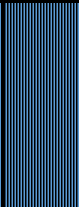
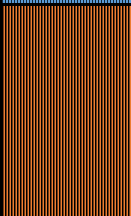
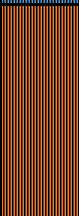
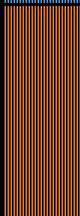
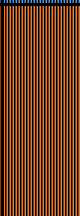
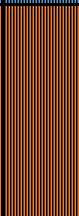
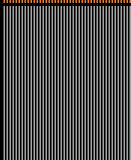
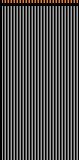
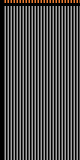
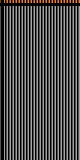
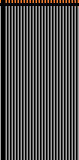
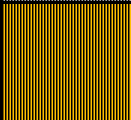
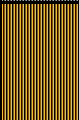
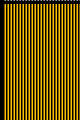
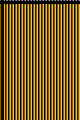
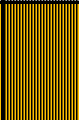
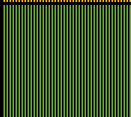
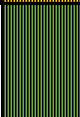
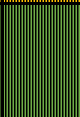
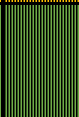
| S. No | Legend                                                                            | Workshops / Training                                                                                                                                                                          | Level    | Responsibility   | Year 1                                                                              | Year 2 | Year 3                                                                              | Year 4 | Year 5 | Year 6 | Year 7 |
|-------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------------|-------------------------------------------------------------------------------------|--------|-------------------------------------------------------------------------------------|--------|--------|--------|--------|
| 1     |  | Social Management Framework<br>(Social assessment, land<br>resettlement, labor management<br>framework, indigenous people,<br>citizen engagement, grievance<br>Redressal, inclusion strategy) | State    | PCMU             |  |        |  |        |        |        |        |
| 2     |  | Social Management Framework                                                                                                                                                                   | Regional | PCMU/RIU         |  |        |  |        |        |        |        |
| 3     |  | Social Management Framework                                                                                                                                                                   | District | PCMU/RIU/<br>DIU |  |        |  |        |        |        |        |

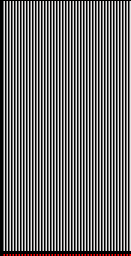
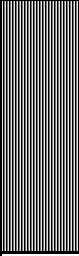
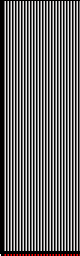
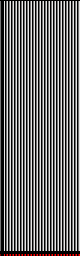
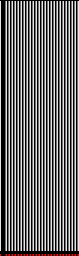
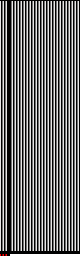
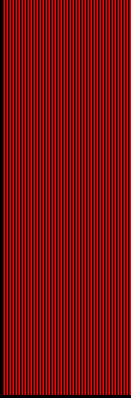
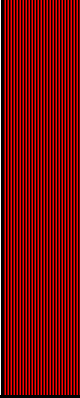
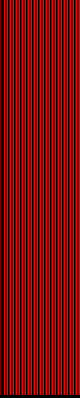
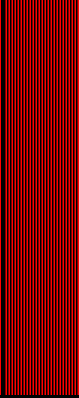

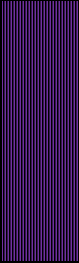
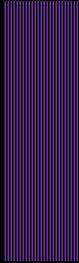
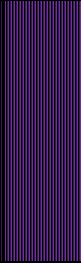
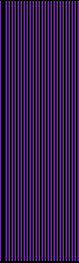
Environmental management budget of INR **43,56,20,000/-** has been estimated for training, capacity building and environmental management and monitoring.

**Table 61: Tentative Environment Budget and Capacity Building Timeline Gantt Chart**

| Sr No.                                                                                                                                                                                                             | Proposed Activity                                                                                                                                                                                                                  | Unit Type | Unit Cost (INR) | Total Units | Total Cost (INR)      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------------|-------------|-----------------------|
| <b>Component B: Supporting Enterprise Growth and Expanding Market Access Subcomponent 4- Technical Trainings and Extension activities for value chain development by PIUs in catchment areas of PPs &amp; MAPs</b> |                                                                                                                                                                                                                                    |           |                 |             |                       |
| 1.                                                                                                                                                                                                                 | B.1: Weekly training to Farmers through the Farmer Field Schools under Subcomponent 4.1. PIU, Agriculture; Value Chain Development Schools - Field Crops                                                                           | Numbers   | 32,000          | 2,400       | 7,68,00,000/-         |
| 2.                                                                                                                                                                                                                 | B.1: Training on GAP / Organic, Traceability and Food Safety Under Subcomponent 4.2. Value Chain Development Schools - Horticulture                                                                                                | Numbers   | 2,000           | 25,000      | 5,00,00,000/-         |
| 3.                                                                                                                                                                                                                 | B.1: Training on Market Led Crops Demos for GAP Certifications, Organic Certifications, Traceability                                                                                                                               | Numbers   | 8,000           | 12,500      | 10,00,00,000/-        |
| 4.                                                                                                                                                                                                                 | B.1: Training to Farmers through the Farmer Field Schools under Subcomponent 4.2 Value Chain Development Schools – Horticulture                                                                                                    | Numbers   | 32,000          | 1,000       | 3,20,00,000/-         |
| 5.                                                                                                                                                                                                                 | B.1: Training on Quarantine Pest Free Cluster Development Program under Subcomponent 4.2 Value Chain Development Schools – Horticulture                                                                                            | Numbers   | 1,00,00,000     | 5           | 5,00,00,000/-         |
| 6.                                                                                                                                                                                                                 | B.1: Training on Good Animal Husbandry Training for Farmers under Subcomponent 4.3 PIU AHD for Small Ruminants & Backyard Poultry                                                                                                  | Numbers   | 1000            | 20,000      | 2,00,00,000/-         |
| 7.                                                                                                                                                                                                                 | B.1: Training of Community Cadre (Krishisakhi, Pashusakhi, Community Agriculture Manager, Community Livestock Manager) on GAP, Food Safety and Traceability under Cost of Training for Bridging Technical Support for CLFs & CMRCs | Numbers   | 6,000           | 10,000      | 6,00,00,000/-         |
| 8.                                                                                                                                                                                                                 | B3: Urban Food Pilot. Awareness Campaigns & Training by PMC to goat farmers on GHP and butcher & enterprises on quality certification, GMP, HACCP, FSMS, ISO 22000, SPS                                                            | Lump sum  |                 |             | 70,00,000/-           |
| <b>Subtotal</b>                                                                                                                                                                                                    |                                                                                                                                                                                                                                    |           |                 |             | <b>39,58,00,000/-</b> |
| <b>Component D: Project Management, Monitoring and Learning</b>                                                                                                                                                    |                                                                                                                                                                                                                                    |           |                 |             |                       |
| 9.                                                                                                                                                                                                                 | Hiring of the 08 Nos. of Environmental Safeguard Officers at the Regional (JDA) Level                                                                                                                                              | Months    | 50,000 * 8      | 84          | 3,36,00,000/-         |
| 10.                                                                                                                                                                                                                | Publication of IEC Material                                                                                                                                                                                                        | Numbers   | 200             | 1600        | 3,20,000/-            |
| 11.                                                                                                                                                                                                                | Video Film/Documentary on Best Practices                                                                                                                                                                                           | Lump sum  |                 |             | 19,00,000/-           |
| 12.                                                                                                                                                                                                                | Midterm and End-term Audits                                                                                                                                                                                                        |           | 10,00,000       | 2           | 20,00,000/-           |
| 13.                                                                                                                                                                                                                | Software, Equipment's, Database, etc.                                                                                                                                                                                              | Lump sum  |                 |             | 20,00,000/-           |
| <b>Subtotal</b>                                                                                                                                                                                                    |                                                                                                                                                                                                                                    |           |                 |             | <b>3,98,20,000/-</b>  |
| <b>Total Cost</b>                                                                                                                                                                                                  |                                                                                                                                                                                                                                    |           |                 |             | <b>43,56,20,000/-</b> |

Capacity Building Timeline Gantt Chart for Environmental Safeguards

| Component                                                                    | Legend                                                                              | Task                                                                                            | Sub Component                                                                                          | Responsibility                 | Year 1                                                                                | Year 2                                                                                | Year 3                                                                                | Year 4                                                                                | Year 5 | Year 6 | Year 7 |
|------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|--------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|--------|--------|--------|
| <b>Component B: Supporting Enterprise Growth and Expanding Market Access</b> |    | Weekly training to farmers through the farmer field school                                      | B1: Market Access Support. (PP, MAP and Innovations)<br>Value Chain Development Schools - Field Crops  | PIU Agriculture                |    |    |    |    |        |        |        |
|                                                                              |    | Training on GAP / Organic, Traceability and Food Safety                                         | B1: Market Access Support. (PP, MAP and Innovations)<br>Value Chain Development Schools - Horticulture | PIU- Agriculture/ Horticulture |    |    |    |    |        |        |        |
|                                                                              |   | Training on Market Led Crops Demos for GAP Certifications, Organic Certifications, Traceability |                                                                                                        | PIU- Agriculture/ Horticulture |   |   |   |   |        |        |        |
|                                                                              |  | Training to Farmers through the Farmer Field Schools                                            |                                                                                                        | PIU- Agriculture/ Horticulture |  |  |  |  |        |        |        |
|                                                                              |  | Training on Quarantine Pest Free Cluster Development Program                                    |                                                                                                        | PIU- Agriculture/ Horticulture |                                                                                       |  |  |  |        |        |        |

| Component | Legend                                                                              | Task                                                                                                                                                                                                                          | Sub Component                                                                                                                       | Responsibility                     | Year 1                                                                                | Year 2                                                                                | Year 3                                                                                | Year 4                                                                                | Year 5                                                                              | Year 6 | Year 7 |
|-----------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------|--------|
|           |    | Training on Good Animal Husbandry Practices                                                                                                                                                                                   | B1: Market Access Support. (PP, MAP and Innovations)<br>Value Chain Development Schools - Livestocks (Ruminants & Backyard Poultry) | PIU- Animal Husbandry              |    |    |    |    |  |        |        |
|           |   | Training of Community Cadre (Krishisakhi, Pashusakhi, Community Agriculture Manager, Community Livestock Manager) on GAP, Food Safety and Traceability under Cost of Training for Bridging Technical Support for CLFs & CMRCs | B: Capacity Building of the CBOs                                                                                                    | PIU- Agriculture/ Animal Husbandry |                                                                                       |   |   |   |                                                                                     |        |        |
|           |  | Urban Food Pilot. Awareness Campaigns & Training by PMC to goat farmers on GHP and butcher & enterprises on quality certification, GMP, HACCP, FSMS, ISO 22000, SPS                                                           | B3: Urban Food Pilot                                                                                                                | PIU- Animal Husbandry              |  |  |  |  |                                                                                     |        |        |

| Component | Legend | Task | Sub Component | Responsibility | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 |
|-----------|--------|------|---------------|----------------|--------|--------|--------|--------|--------|--------|--------|
|           |        |      |               |                |        |        |        |        |        |        |        |

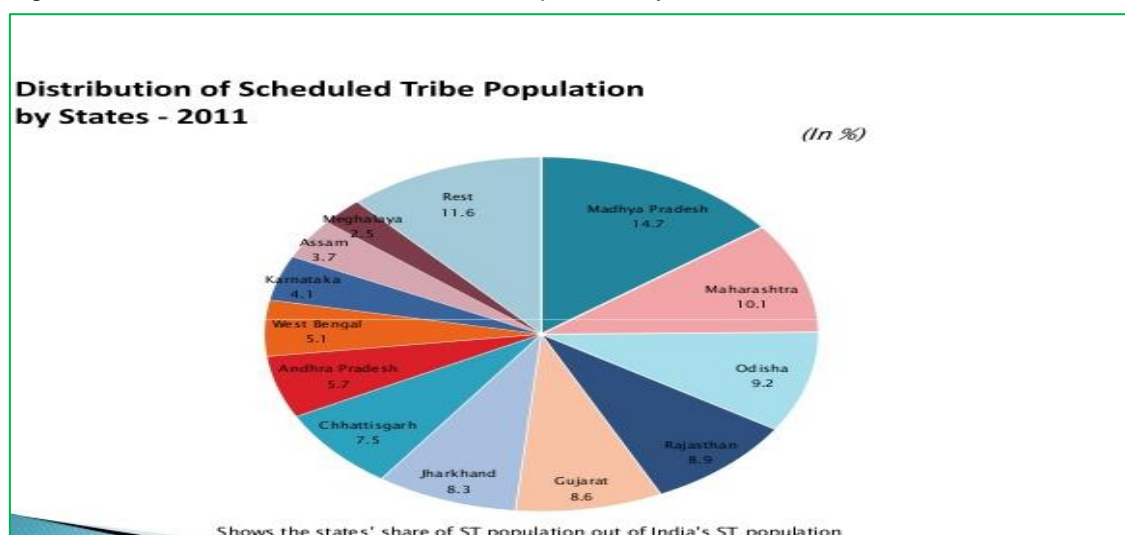
## 7 Indigenous People Framework

The Article 342 provides for specification of tribes or tribal communities or parts of or groups within tribes or tribal communities which are deemed to be for the Constitution of Scheduled Tribes in relation to that State or Union Territory and are valid only within the jurisdiction of that State or Union Territory and not outside. The lists of scheduled tribes are State/UT specific and a community declared as a Scheduled Tribe in a state need not be same in another state. The inclusion of a community as a Scheduled tribe is an ongoing process. The essential characteristics for a community to be identified as scheduled tribes are- Indications of primitive traits:

- Distinctive culture
- Shyness of contact with the community at large
- Geographical isolation and
- Backwardness

The term Indigenous Peoples (IPs) is used by the World Bank in a generic sense to refer to a distinct, vulnerable, social and cultural group that have these characteristics in varying degrees, (i) self-identification as members of a distinct indigenous cultural group and recognition of this identity by others, (ii) collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories, (iii) customary cultural, economic, social, or political institutions that are separate from those of the dominant society and culture, and (iv) an indigenous language, often different from the official language of the country or region. This chapter discusses about the profile of this social group, measures to protect their interest from the negative impacts of the proposed project interventions and to promote their inclusion in brief. A detailed IPF has also been prepared and presented as a separate volume to SA Report and SMF. The figure below reflect that the project state has high presence of Tribes. The tribal people in urban areas do not exhibit typical characteristics such as living as a group; speak separate language from dominant population, having separate institutions in close attachment to the forest etc.; the identification and inclusion of tribal groups in the project activities would be ensured though social screening.

Figure 17: Distribution of Scheduled Tribe Population by States



Source: Scheduled Tribes of India, census 2011

### 7.1 Regulatory Provisions for Indigenous People

The regulatory provisions for indigenous people are noted below:

### 7.1.1 Notification

- Article (preamble) 342- Declaration for Indigenous People
- Article 366- Define Indigenous People

### 7.1.2 For Education, Economics and Public employment- related safeguards

- Article 15- Prohibition of discrimination on grounds of religion, race, sex, caste or place of birth.
- Article 16- Equality of opportunity in matter of public employment.
- Article 19- Protection of certain rights regarding freedom of speech etc.
- Article 46- Protection of Education and Economic interest of Scheduled castes, Indigenous people and other weaker sections.
- Article 335- Claims of Scheduled Castes and Indigenous People to services and posts

### 7.1.3 Agency for monitoring safeguards

- Article 338A- national commission for Indigenous people.

### 7.1.4 Fundamental rights (Provisions support to subprojects Indigenous People)

- Article 23- Prohibition of traffic in human beings and forced labour
- Article 24- Prohibition of employment of children in Labour work, factories etc.
- Article 38- State to secure a social order for the promotion of welfare of the people.
- Article 39A- Equal justice and free legal aid

The above provisions will be helpful in project areas to protect the fundamental rights and safeguard the Indigenous People. In addition to the above, OP/BP-4.10 of World Bank policy contributes to the Bank's mission of poverty reduction and sustainable development by ensuring that the development process fully respects the dignity, human rights, economies and cultures of Indigenous Peoples.

## 7.2 Status of Tribals in the State of Maharashtra

Maharashtra accounts for 10.1 percent of the Scheduled Tribe population of India and is the second largest in tribal population in the country. Maharashtra has 47 tribes including three particularly vulnerable tribal group. The major tribal groups in Maharashtra are Bhil, Gond, Koli Mahadev, Warli, Kokana, Thakur and Andh.

In the sample districts, it was found that tribal people are involved in agriculture and horticulture, fisheries, livestock rearing. Seasonal livelihood is prevalent in these districts. Among the communities consulted, it was found that special attention needs to be given to the tribal community, who are dependent on natural resources for the purpose of drinking water and water usage for domestic purpose – such as cooking, cleaning, bathing, rituals, ceremonies, cultivation of vegetables, staple crops, fodder and other traditional activities and dependence on forests for NTFP collection, processing and sale. Further, tribal people belonging to the Primitive Tribal Groups (PTGs), and those living in difficult terrains, e.g. hill tops, etc. are highly dependent on forests for NTFP, with marginal or no landholding, practicing primitive or subsistence-based agriculture, etc. needs special attention.

Further within State, there may districts with high tribal population. Although the proposed project will have positive social impacts owing to benefits such as, improved agricultural produce; better market linkages, better storage facility, and livelihood development, however, to ensure project interventions does not adversely affect the tribal community, especially PTGs, PIUs/DIUs, would ensure that all the sub-projects are selected after undertaking Social Screening, and following key steps:

- ensuring participation throughout the project cycle

- sharing of information on identified commodities
- plan for implementation of identified works
- Livelihood activities, etc.

### 7.3 Indigenous Peoples Framework (IPF)

A project proposed for World Bank financing that affects IPs requires: (a) screening to identify whether Indigenous Peoples are present in, or have collective attachment to, the project area; (b) a social assessment to establish baseline situation; (c) a process of free, prior, and informed consultation with the affected IPs' communities at each stage of the project, and particularly during project preparation, to fully identify their views and ascertain their broad community support for the project; (d) the preparation of an Indigenous Peoples Plan (IPP) or an Indigenous Peoples Planning Framework (IPPF); and (e) disclosure of the draft IPPF.

As SMART will be implemented in rural and selected peri-urban areas of Maharashtra, where Scheduled tribes constitute around 10 percent of the total population, an IPF is required to be prepared and implemented. Hence, as part of ESMF, an Indigenous Peoples Development Framework (IPDF) has been prepared in line with the World Bank safeguard Policy. The IPF aims at effectively promoting Indigenous People's (IPs) participation throughout the project cycle. The general objective of the IPF is the inclusion of the IP communities in the project in order to achieve the highest possible positive impact of the interventions to improve their quality of life, through strengthening their organization, self-management, and capacity of their members. The specific objectives of the IPF are to ensure that:

- Project engages in free, prior and informed consultation with tribal people
- IPs have access to project activities and its benefits
- Works and services under the project do not inadvertently induce inequality by limiting project benefits to the elite elements of the community
- The project conducts Free Prior and Informed Consultation and takes their consent, through a consultation process appropriate to the local cultural context and local decision-making processes and
- Establish appropriate information, communication, and diversity-training strategies with the different IPs and communities in all stages of the project. All this will be ensured through the following steps:
  - Screening through survey to identify whether Indigenous People are present in or have collective attachment to the project area. Specifically, the project would first ascertain whether the affected persons meet the following four characteristics of Indigenous Peoples as specified in WB OP 4.10
    - Self-identification as members of a distinct indigenous cultural group and recognition of this identity by others;
    - Collective attachment to geographically distinct habitats or ancestral territories in the project area and to the natural resources in these habitats and territories
    - Customary cultural, economic, social, or political institutions that are separate from those of the dominant society and culture; and
    - An indigenous language, often different from the official language of the country or region
  - If the assessment indicates presence of such groups in the project area then a subproject specific IPP would be prepared, and will be followed by the below mentioned steps:
    - Undertake social assessment in project areas as per parameters suggested in bank policy
    - A process of free, prior and informed consent with the affected Indigenous Peoples' communities at each stage of the project and particularly during project preparation to fully identify their views and ascertain their broad community support for the project.

- Preparation of an Indigenous People Plan (IPP)
- Disclosure of draft Indigenous People Plan

### 7.3.1 Free, Prior, Informed Consultation (FPIC)

Free, Prior, Informed Consultation (FPIC) intends to fully identify the views of the indigenous community and ascertain their support for the project. Thus, it has been included as an important part of project preparation and implementation of SMART. The FPIC has twin objectives of: (i) disseminating details about the proposed project, its adverse and favourable impact on the community; and (ii) integrating the indigenous households with suitable sub-project interventions. Informed participation involves organized and iterative consultation through which the views of the communities on matters that affect them directly, such as proposed sub-project intervention requirements, eligibility criteria, the sharing of development benefits and opportunities and implementation issues, shall be incorporated into the decision-making process for the project. The concept and principles of FPIC is summarized as follows:

- **Free:** The project shall not coerce, intimidate or unduly incentivize the affected communities to be supportive of the project. The project shall document the discussions with recognized community representatives, key informants, etc.
- **Prior:** Consultation with affected communities shall be sufficiently early in the project planning process: (i) to allow time for project information to be interpreted and comments and recommendations formulated and discussed, (ii) for the consultation to have a meaningful influence on the broad project design options, (iii) for the consultation to have a meaningful influence on the choice and design of sub-project interventions, the sharing of development benefits and opportunities, and overall project implementation, monitoring and evaluation.
- **Informed:** Consultation with affected communities shall give details about project operations and potential adverse impacts and risks, based on adequate and relevant disclosure of project information and using methods of communication that are inclusive, culturally appropriate and adapted to the community's language needs and decision making, such that the community fully understand how the project will have an impact on their lives.
- Focused approach shall be planned towards achieving active participation of tribals and they have access to project benefits at par with mainstream communities. The focused strategy therefore would be to suggest measures that are high impact and takes into consideration of major challenges pertaining to information, decision making and skill up-gradation.

### 7.4 Indigenous People Plan (or Tribal Development Plan)

The IPP (or Tribal Development Plan) shall contain the following

- Project Description -SMART and proposed subproject
- Objectives of IPP/TDP
- Methodology for preparation of IPP (include results from the Screening exercise)
- Minimization of impacts
- Free and prior informed consent (FPIC) for Broad community support
- Social Assessment
  - Household survey findings
  - Impact details - positive impacts and adverse impacts on assets, community resources, livelihood etc.
- Action Plan
  - Mitigation measures (as outlined in the IPF)
  - FPICs to be undertaken during implementation

- Implementation schedule (by activities and months)
- FPIC
- Provision of mitigation measures
- Monitoring of implementation
- Monitoring indicators (as necessary by subproject)
- Implementation budget including cost of
  - mitigation measures
  - conducting FPICs - material, logistics
- Grievance mechanisms.

## 7.5 Beneficiary Assessment

A baseline beneficiary assessment will be carried out for all the subprojects wherever appropriate, through relevant instruments including sample household surveys, FGDs, secondary information through Census, NSSO data etc. to collect relevant baseline information related to the subprojects. Beneficiary assessment will cover wellbeing ranking, PTGs, perceptions among women, etc. This activity will be completed during the first year of the contract award and will be included in the DPR to be used to measure the improvements against the baseline situations after the subprojects are completed.

## 7.6 Inclusion Plan

A plan for promoting the socio-economic inclusion of the IPs has also been proposed for the Project and is presented in Table below:

**Table 62: Tribal Development Strategy during various Stages of Project Cycle**

| Stages         | Procedures                                                                                                                         | Activities & Outcome                                                                                                                                                                                          |
|----------------|------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Preparation    | Identify concerns/issues in relation to the project activities through Participatory Rural Appraisal (PRA) exercises               | Preparation of a list of issues                                                                                                                                                                               |
|                | Communicate with tribal community / leaders to carry out Free, Prior, Informed Consultation at village level                       | Information dissemination on SMART and brief account of project implementation plans                                                                                                                          |
|                | Organize consultation with STs to inform about the project activities and benefits                                                 | Stakeholders consultations and FGDs held                                                                                                                                                                      |
|                | Identify key areas of constraints that may be improved through the project and develop detailed plan for tribal development        | <ul style="list-style-type: none"> <li>▸ List areas of constraints</li> <li>▸ Number of consultations &amp; signed minutes</li> <li>▸ List of activities specifically targeting tribal development</li> </ul> |
| Implementation | Ensure equal participation of STs in monitoring                                                                                    | Representation of members from tribal communities in monitoring committee                                                                                                                                     |
|                | Employment to members from tribal community in carrying out actual construction work                                               | Number of tribal employed                                                                                                                                                                                     |
| Operation      | Ensure representation of ST members in FPOs/BoDs                                                                                   | Number of tribal members in decision making body of such FPOs                                                                                                                                                 |
|                | Capability building of ST members and skill upgradation                                                                            | <ul style="list-style-type: none"> <li>▸ Training calendar to be prepared</li> <li>▸ Number of trainings undertaken</li> <li>▸ Number of tribal members trained</li> </ul>                                    |
|                | Employment generation for ST in related sub project activities                                                                     | Number of women members employed undertaking various activities                                                                                                                                               |
|                | Help build linkages with major government schemes for tribal development particularly skill enhancement and technology upgradation | Number of projects linked in the sub project locations                                                                                                                                                        |

The project proposes to offer up to 60 percent Viability Gap Fund (VGF) to subproject FPOs. While doing so, it is suggested that the maximum required VGF (within 60 percent cap) must be provided to tribal FPOs.

## 8 Institutional and Implementation Arrangements

### 8.1 Institutional framework for E&S Management

Department of Agriculture (DoA) is responsible for the technical aspects and overall execution of the Project. DoA as project implementation agency will arrange to provide technical support for the institutional framework proposed for E&S management under SMART. The E&S management cell, within PCMU will be responsible for screening of project proposals for impact categorisation, planning for mitigation measures and monitoring. Also, each PIU will have an E&S cell consisting of either E&S specialists or specialists from within the PIUs existing structure that will assist the requirements of the E&S cell of the implementing agency. At each RIU level, there will be one Environmental and Social Specialist for Monitoring E&S safeguards.

#### 8.1.1 Roles and Responsibilities

The arrangements for reviewing and monitoring the project from the perspective of Environment and Social Management will form a part of the overall arrangements for project management and implementation for SMART. This is briefly described below:

##### **Level 1: Project Steering Committee**

At this level, E&S performance under the project may be reviewed on a six monthly or annual basis where strategic E&S issues faced by SMART may be taken up for discussions and decisions taken regarding appropriate policy and coordination support as may be required.

##### **Level 2: Project Coordination and Management Unit (PCMU)**

At the second level, Environment and Social Management issues related to the project may be discussed and monitored at a regular frequency, say monthly or bi-monthly by a body of managers and technical experts who are involved in the implementation of the project. This body may be expected to regularly review performance on agreed E&S indicators, including an annual review.

##### **Level 3: Environmental and Social Management Cell**

At the third level, the responsibility for E&S management may be entrusted to a cell that could form part of the Unit responsible for the management and implementation. This Unit, which would be required to have managers and technical specialists with appropriate knowledge in relation to the different sub components, is expected to take forward the planning and implementation of each specific sub component proposed under SMART. Through the ESM cell, the Project proponents (specifically the implementation and Coordination cell) would need to be responsible for:

- Screening of sub-projects
- Reviewing sub-projects in reference to agreed E&S indicators
- Environment and social management framework applicability for the sub-project in terms of identified environmental and social risks, possible mitigation and enhancement measures
- Responsible for monitoring and approving all land acquisition activities. Details of actions in case of land acquisition is specified below.
  - i. Liaison with respective PIU to facilitate PAP access and take advantage of services and programs already in place
  - ii. Evolve mechanisms for coordinating the delivery of the compensation and assistance to entitled persons

- iii. Review and provide social development perspectives and inputs to on-going project design and implementation by working closely with project planners, contractors, and construction supervision consultants
  - iv. Oversee a grievance redress process, and actively monitor RAP implementation
  - v. Undertake regular but sample-based monitoring of ESMF implementation under SMART and for this purpose may undertake specialized assessments, studies or depute additional staff, as needed. In addition to the above, any Third-Party monitoring and during different stages of the project, e.g. Mid Term Review (MTR), would include tracking the monitoring indicators and evaluating the performance of ESMF implementation.
- Site visit and analysis, especially in cases of land acquisition
  - Responding to queries raised on environmental and social issues.
  - Acting as single point information system for all information required in the context of the ESMF of the project.
  - Ensuring that sub-project level ES management plans (ESMP) are in accordance with ESMF
  - Monitoring and generating evaluation reports on the performance of the project in reference to agreed E&S indicators;
  - Organising training for the concerned human resources in PIUs on project ESMF process requirements
  - Organising mid-term and end of project evaluation studies and any specific studies to be done by PCMU and PIUs relating to ESMF activities.
  - Providing technical and quality review of the proposal submitted by various PIUs.

In case of land acquisition, the social specialist, will ensure that the civil works will be initiated only after the required Right of Way (RoW) or land width is free from any encroachments and the PCMU/PIU has the physical possession of the land. Before the start of civil works the compensation must be disbursed to the land owners in districts / project locations, where it is decided to acquire the land through payment and the MoUs/Affidavits should be in place in the DPRs in districts where land is arranged through donation for works reacted to infrastructure development. During implementation, consultations with the communities shall be undertaken by the PCMU/PIU for providing information on the progress of the project work. In case, the Land Management Committee<sup>12</sup> has not been either established or is inactive, the Department of Agriculture through a competent authority / committee shall issue Government Order /Notification for its formation at the village level. The table below describes roles & responsibilities in case of land acquisition.

**Table 63: Roles and Responsibilities to Implement RF at Various Levels**

| Levels                                                                    | Roles and responsibilities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Project Director<br/>Department of<br/>Agriculture, GoM</b>            | Overall responsible for supervision of SMF, including RF and IPF.                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Additional Project<br/>Director Department<br/>of Agriculture, GoM</b> | <ul style="list-style-type: none"> <li>• Supervising / handling of land transfer related matters</li> <li>• Ensuring preparation of land acquisition plan and requisitions</li> <li>• Facilitating and supervising disbursement of compensation and R&amp;R as per RTFCTLARR Act prior to initiation of civil works</li> <li>• Verify ownership of impacted land parcel through proof of ownership during census survey</li> <li>• Supervise process of land transfer and addressal of grievances</li> </ul> |

<sup>12</sup> Members of Land Management Committee consist of all members of Gram Panchayat, Lekhpal of Gram Sabha as Secretary, Pradhan and Up- Pradhan of Gram Panchayat will be the Chairman and Vice Chairman of LMC

| Levels                                                               | Roles and responsibilities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                      | <ul style="list-style-type: none"> <li>● Supervise identification &amp; finalisation of impacts and PAPs through social screening and assessing extent of impacts through Census Surveys (Vulnerable PAPs and Entitled Persons)</li> <li>● Verification of vulnerability of PAPs based on the criteria adopted</li> <li>● Supervise &amp; coordinate with line Department for finalization of entitlements and schedule for enrolments</li> <li>● Ensuring disbursal procedures for entitlements as per schedule</li> <li>● Verify submission of Gift Deed/Affidavit/MoU from landowners</li> <li>● Coordinate redressal of additional unforeseen impacts during construction</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Social Safeguards Specialist, PCMU, Department of Agriculture</b> | <ul style="list-style-type: none"> <li>● Ensure dissemination of information to community/PAPs as proposed in the RF</li> <li>● Coordinate with agencies for ensuring implementation of social development issues of RF</li> <li>● Coordinate between PIUs for finalization of entitlements and enrolment procedures</li> <li>● Coordinate with DPR consultants, coordinator &amp; social specialist, PIU, PRI/ ULBs and local stakeholders for application of the ESMF/ RF</li> <li>● Coordinate assessment of people affected by the project; assess vulnerability and entitlement issues and coordination of R&amp;R implementation</li> <li>● Ensuring compliance of safeguards in the PPP and MAP</li> <li>● Review of RAP and its implementation</li> <li>● Monitor physical investments under the project for fulfilment of R&amp;R issues in coordination with the PIU coordinators</li> <li>● Report progress on implementation of safeguards</li> <li>● Review SIA of Projects at various stages of the implementation and update the same as per the prevailing conditions at that time</li> <li>● Proper application of social screening procedures for the selection of PPP &amp; MAP</li> <li>● Review LA and RAP Reports</li> <li>● Maintain training calendar and co-ordinate with various stakeholders related to capacity building</li> <li>● Ensuring incorporation of social issues in DPR prior to approval</li> <li>● Supervising the RF tasks during implementation &amp; its progress in coordination with PRI</li> <li>● Collect data pertaining to the evaluation and monitoring indicators</li> </ul> |
| <b>Coordinator, Project Implementing Unit (PIU)</b>                  | <ul style="list-style-type: none"> <li>● Ensuring disclosure of final sites by Zila Panchayat and Gram Panchayat at Panchayat Office and make sure that copies of finalized sites are made available to the community</li> <li>● Coordinate and oversees land availability for taking up proposed investments as per the RF provisions.</li> <li>● Dissemination of Project Information at various stages of project as envisaged in the RF</li> <li>● Documentation and disclosure of community consultations outputs in coordination with PRI (Sarpanch or other members)</li> <li>● Coordinate with AE/JE along with Talathi and PRI to identify locations for land width accretion and ownership including the customary rights in tribal areas</li> <li>● Identification of impacts and PAPs through social screening and assessing extent of impacts</li> <li>● Supervising the RF tasks during implementation and its progress in coordination with PRI</li> <li>● Collect data pertaining to the evaluation and monitoring indicators</li> <li>● Ensuring incorporation of social issues in DPR prior to approval.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Social Specialist, PIU/RIU</b>                                    | <ul style="list-style-type: none"> <li>● Proper application of social screening procedures for the selection of PPP and MAP</li> <li>● Verify social impacts prior to initiation of civil works</li> <li>● Ensure implementation of RAP and disbursement of entitlements with support of CBOs</li> <li>● Ensure consultation and participation of Scheduled Tribes, scheduled Castes, in a cultural and gender sensitive manner throughout the project cycle.</li> <li>● Coordinate between PCMU, PRI / CBO and the aggrieved for time bound release of entitlements as per RF</li> <li>● Supervise RAP implementation</li> <li>● Ensure implementation of Indigenous Peoples Framework.</li> <li>● Ensure that the GRC is convened regularly</li> <li>● Compliance of actual works with contract conditions and quality assurance procedures as well as agreed social management measures</li> <li>● Sensitizing and capacity building of the PIU/DIU/CBO, the PRI representatives towards implementation of the ESMF/ RF provisions.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>District Level (ZP Chairman / President)</b>                      | <ul style="list-style-type: none"> <li>● Display of final set of sites at the Zila and Gram Panchayat Office</li> <li>● Ensure establishment of Land Management Committee for grievance redressal at village level through PIU/DIU</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Village Level</b>                                                 | <ul style="list-style-type: none"> <li>● Dissemination of project information as per the RF in village in coordination with the PCMU/PIU</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

**Levels****Roles and responsibilities****Village Council /  
Gram Panchayat****(Sarpanch and other  
Panchayat Members)**

- Finalization of sites along with PIU and Revenue Department through process of community planning
- Ensure the finalization of sites as per the RF guidelines
- Organize Consultation involving community and PAPs to disclose screening output
- Encourage community/PAPs to voluntarily donate assets especially land
- Undertake Census Survey to assess the extent of impacts along with the PIA
- Identification of vulnerable PAPs and their verification as per the eligibility criteria
- Ensure finalization of procedure for land transfer and disbursal of entitlements
- Responsible to collect Gift Deed/Affidavit/MoU from landowners and subsequent submission to PIA
- Make sure that contractor holds consultation with community prior to mobilization of machinery
- Supervising the RF tasks during implementation and its progress in coordination with PIA.

## 9 Citizen Engagement, Disclosure and Grievance Redress Mechanism

### 9.1 Citizen Engagement Approaches

This section describes citizen engagement approaches that the project can adopt during implementation:

#### 9.1.1 Consultations

**Meaningful consultations** contribute to improved design, implementation, and sustainability of project's interventions. The objectives of citizen consultations for SMART will include receiving input for improved decision-making about the design and implementation arrangements, which can contribute to improved project results and sustainability. Stakeholder consultations will be done during the entire project cycle, i.e., preparation, implementation and post implementation. During the preparatory stages, consultations need to be carried out with line departments, officials at the regional and district levels and local communities (members of the value-chain) as part of the project in order to gather their views on the proposed project.

**Consultation with Tribals (IPs)** – The PCMU and project counterparts (PIUs) will ensure that in case of tribal involvement, Indigenous Peoples Plan will be prepared in consultation with the affected IP groups. Prior consultation will be held, and no objection will be obtained from the IPs, if they are affected by land acquisition<sup>13</sup>. The mitigation measures and strategies will be presented to them by the PCMU/PIU at various places, which will be easily approachable to them. Inputs from the IPs through consultation will be considered in subproject design and the final plan. The PCMU/PIU will be involved in implementing the IPP/RAP, as the case may be, and resolution of any dispute arising out of the implementation process. Consultations and information disclosure will be undertaken to ensure that needs, priorities and preferences of IPs are adequately dealt with. The strategy of consultation, therefore, would be to promote participation of the IPs, initiating and identifying people's need, priorities and preferences through participatory approaches. Consultations will be held to:

- Create awareness
- Bring various stakeholders on a common platform
- Seek information
- Pass on information
- Capacity building

The key stakeholders to be consulted during sub-project preparation and implementation includes:

- All CBOs / FPOs, including women led CBOs and vulnerable households
- Stakeholders in the value chain
- Host populations in project sites (if any)
- Elected representatives, community leaders/ Indigenous leaders
- Local government and relevant government agency representatives
- Project staff

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<sup>13</sup> In case of land acquisition, RAP/ARAP will be prepared in compliance with the OP4.12

### 9.1.2 Collaboration

Collaboration with citizens in decision-making processes and events results in more responsive decisions to citizens' needs and improves the sustainability of project outcomes through increased ownership by citizens. SMART can opt for any of the following mechanisms for collaboration:

- Citizen/CBOs membership in decision-making bodies
- Participatory planning and budgeting
- Formation of social audit committees.

### 9.1.3 Collecting, Recording, and Reporting on Inputs from Citizens

Citizen feedback can be collected periodically on various dimensions of project interventions, such as effectiveness, inclusiveness, quality, delivery time, transaction costs, and targeting, as well as on resource utilization or engagement processes. Tools include satisfaction surveys, focus group discussions, hotlines, community scorecards, citizen report cards, or SMS/online feedback. Following tools are suggested:

- **Beneficiary Satisfaction Surveys:** Under the project, PCMU can conduct beneficiary satisfaction survey with various stakeholders such as CBOs (farmers), consumers, operators of collection centres, storages, PIU and DIU staffs, at the start, mid-point and close of project. The information received will support the Project to
  - measure the level of beneficiary satisfaction about the services received through PP, MAP, including gender aspects and
  - Receive feedback from CBOs/FPOs about the effectiveness and efficiency of the Project interventions.
- **Project dissemination workshops and Focus Group Discussions (FGD):** The Project can:
  - hold regular workshops / FGDs at field levels before launching activities under PPP and MAP to allow stakeholders, media, and public representatives of opportunity to interact with the Project officials and other relevant personnel
  - implement the SMF to ensure access and rights of all persons in accessing the facilities under the Project
  - ensure all official public documents and the Project website include contact information for conveying any issue on the Project activities.
- **SMART Web Portal** – An exclusive web portal to disseminate information about the project can be created. The web portal can include details about project components, sub-components, activities, implementing arrangements, locations, services offered, physical and financial progress, safeguard mechanisms, reports and documents. The project can have online provision and toll-free number where citizens could provide their feedback and register grievances.
- **Installation of Feedback-boxes at District Implementing Units** –The box to be placed at visible and accessible locations and citizens be provided with the option of providing feedback with or without disclosing their identity.

## 9.2 Disclosure

The IPP/ RAP prepared in consultation with affected people (IPs, vulnerable and others) will be translated into local language or any other medium which will be understood by the affected and made available to them before implementation with the assistance of PCMU/PIU. The PCMU will ensure that adequate funds will be made available for consultation and facilitation. Indigenous Peoples may be particularly vulnerable when project activities include:

- Commercial development of the cultural resources and knowledge of Indigenous Peoples
- Physical displacement from traditional or customary lands

- Commercial development of natural resources within customary lands under use that that would impact the livelihoods or the cultural, ceremonial, or spiritual uses that define the identity and community of IPs.

In deciding whether to proceed with a project involving such project activities, the PCMU/PIU will seek the consent of affected communities. The IPP or RAP will further be disclosed in the website of PCMU/PIU and WB, including in the local language.

### 9.3 Grievance Redress Mechanism (GRM)

The PCMU will establish a mechanism to receive and facilitate resolution of the affected people's concerns, complaints, and grievances. The WB procedures require SMART PCMU to establish a project specific Grievance Redress Mechanism (GRM) having suitable grievance redress procedure to receive and facilitate resolution of affected peoples' concerns, complaints, and grievances about the social and environmental performance at CBO level for PP/MAP. For this project, PCMU would ensure that a Centralized Control and Monitoring System (CCMS) is established at the Department level that will provide the adequate platform for the GR and will be streamlined to address issues of all the relevant stakeholders of the project like CBOs, local community, contractors, and other members in the value chain. This system will ensure that all the grievance of the stakeholders, including IP community, is addressed in a time bound and effective manner. At each level of the project, there will be a designated representative, to look at the grievance raised at the workplace and ensure timely mitigation measure for the same. There will also be a provision of continuous monitoring of the system to track the issues and the solution. Monitoring the system will be beneficial in the trend analysis of the issues and the effectiveness of the system to resolve the same

In cases of tribal / Indigenous peoples, wherever relevant and wherever traditional mechanisms are prevalent, the GRM will be customized to the needs of IPs and other vulnerable community people and to address the needs of IPs and vulnerable community communities. All such complaints will be discussed in the specific IP community or locality where the subproject (PP or MAP) is implemented using the existing practiced traditional conflict resolution procedures. In addition, wherever IPs, primitive indigenous groups and vulnerable community people are in large numbers, there will be a small ethnic and vulnerable community representative in the grievance committees. For addressing grievances arising under SMART, following grievance redressal mechanism is proposed:

#### 9.3.1 Appointment of Grievance Redressal Officer

- The PCMU under SMART shall nominate an officer as 'Grievance Redressal Officer' (GRO) to deal with all matters relating to public grievances/ complaints. At the PIU/ Regional / District level an official will be designated to serve the role of GRO.
- The list of GROs must be displayed at all levels. Every office should display at a prominent place/ notice board the name of GRO with location, contact numbers/ mailing IDs and address along with the specific visiting hours for hearing / receiving the grievance/complaints of the public.

#### 9.3.2 Grievance/Complaint Submission

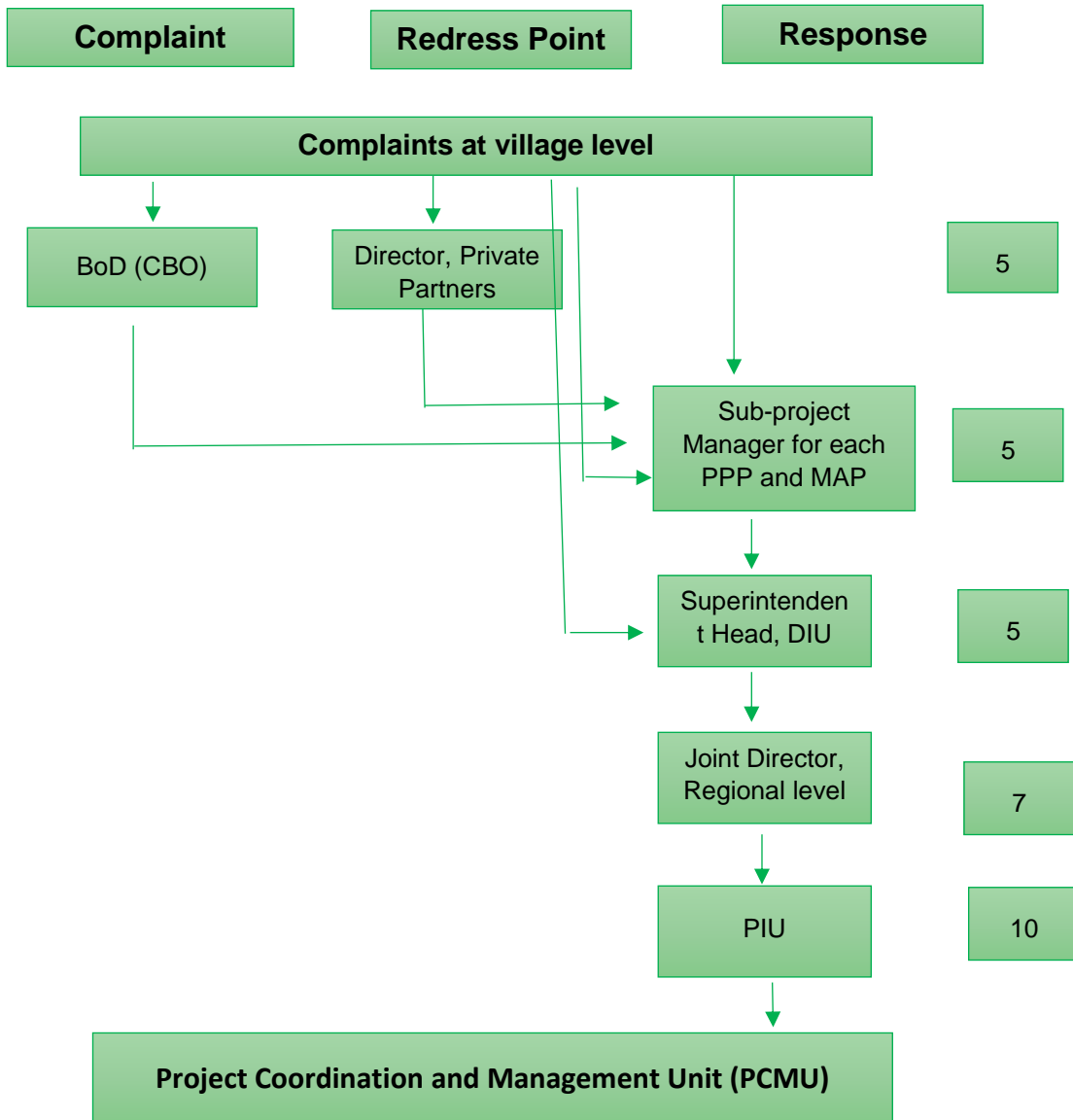
- While complaint is made, it can either be made orally or in writing or in person giving details of:
  - The name of the individual or organization, postal address, email and/or telephone number (if any) of the complainant.
  - A brief description of the matter which is the source of the grievance, including copies of any relevant and supporting documents.
  - Relief sought

- Grievances may also be submitted in the Complaint Box kept at reception of every office. The Complaint Box should be opened on daily basis by the GRO. Complaint can also be sent by post.
- A complaint made through electronic means (e-mail, fax) should also be accepted and acknowledgment should be sent using any of the communication means. The complaints may also be sent to the e- mail address of the GRO of PCMU, SMART i.e., or may be submitted at webpage.
- In case the complainant is not satisfied with the response at a certain level, he/ she will be free to approach the next level.

### 9.3.3 Grievance Redressal Procedure

- Every application/complaint received should be tagged with a specific reference number (the project can set-up online GRM/mobile-enabled). The grievance system should be continuous and regularly monitored by the PCMU staff.
- Every application or petition should be acknowledged through standard acknowledgement slips or a copy of the receipt which should be dispatched to the complainant within 3 days of receipt of complaint or handed over to person at the time of receipt for complaints submitted in person.
- Every application should carry such a slip for future reference indicating the name, designation and telephone number of the official who is processing the case. The time frame in which a reply will be sent should also be indicated (*the ideal time suggested is 7 days*).
- The complainant should be quickly informed of the action taken by way of redressal within proposed response time suggested at each level.
- A record of all complaints received, and action taken till disposal should be maintained at each level (*complaint registers and /or online*).
- A reply to any grievance must cover all points raised and not address the grievance partially. If there is any follow- up action, it must be pursued.
- No grievance is to be rejected without having been independently examined. At a minimum, this means that an officer superior, to the one who delayed taking the original decision or took the original decision that is cause for grievance, should examine the case as well as the reply, intended to be sent to the complainant. If a complaint is rejected, the reasons for such rejection must be made explicit and should be intimated to the complainant with in the time frame.
- The Complaints related to PCMU will be dealt directly by the GRO of the PCMU and redressal will be done as per fixed time frame. The decision of the PCMU will be final and will be abided. However, in all cases, complainant will be free to exercise his/her rights to approach judicial system.
- Grievance redressal mechanisms will consider the vulnerability of gender, SC/ST and other vulnerable populations. A suggested approach for grievance redressal mechanism is being presented in figure below:

#### Figure 18: Suggested GRM



# 10 Women's Participation - Constraints and Opportunities

## 10.1 Gender Analysis

Women make essential contributions to agriculture in developing countries, but their role differ significantly by region and is changing rapidly in some areas. On an average, 43 percent of women's labour is involved in agriculture in the world<sup>14</sup>. It varies by country, region, crop, social group, production cycle and ethnic group. Women farmers produce more than half of the food in the world and particularly 80 percent in Africa and 60 percent in Asia. Only 5 percent of the women access agriculture extension resources, and 2 percent have the land title (Patta) in the world. Women comprise 50 percent of agriculture labour force in Eastern Asia & Sub-Sahara Africa and 20 percent in Latin America<sup>15</sup>. In developing countries in Africa, Asia and the Pacific, women typically work 12 to 13 hours per week more than men; yet, women's contributions are often 'invisible' and unpaid<sup>16</sup>.

## 10.2 Women in Indian Agriculture: Statistics

Participation of both men and women in agriculture has declined, but the rate of decline has been faster among men than it has among women. Decline among women has been specifically in relation to their roles as cultivators; however, their numbers as agricultural labourers has increased.

The Agriculture Census (2010-11) shows that out of an estimated 118.7 million cultivators, 30.3 percent were females. Similarly, out of an estimated 144.3 million agricultural labourers, 42.6 percent were females. However, only 12.8 percent of the operational holdings were owned by women, which reflect the gender disparity in ownership of landholdings in agriculture. Moreover, there is concentration of operational holdings (25.7 per cent) by women in the marginal and small holdings categories. Women's participation rate in the agricultural sectors is about 47 percent in tea plantations, 46.84 percent in cotton cultivation, 45.43 percent in growing oil seeds and 39.13 percent in vegetable production.<sup>17</sup> While these crops require labour-intensive work, the work is considered quite unskilled.

### 10.2.1 Issues Faced by Women in Agriculture

- Access to land and credit: The challenges are huge for smallholder women farmers because they face higher entry barriers than men in modern value chains. For instance, women have the least access to and control of productive resources such as land, capital and agricultural services like credit and training that are necessary for increasing yields and moving from subsistence to market oriented production. As per Census Agricultural Census (2015-16), out of a total 146 million operational holdings, the percentage share of female operational holders is only 13.87 percent.
- Land ownership opportunities also have a critical impact on human development with freedom from violence. According to a 2005 study of marital violence and property ownership, 49 percent of property less women experience physical violence and 84 percent experienced psychological abuse. Ownership rights saw a drastic decrease in violence. Among women who owned both land and house there was only 7 percent physical violence and 16 percent psychological abuse.<sup>18</sup>

<sup>14</sup> FAO Report 1984

<sup>15</sup> Value Chain Analysis with gender focus-CGIAR 2013/14

<sup>16</sup> The cost of the gender gap in agricultural productivity ,UN Women/World Bank 2015

<sup>17</sup> 2009.Centre for Trade and Development and Heinrich Boell Foundation. "EU FTA and the Likely Impact on Indian Women Executive Summary."

<sup>18</sup> Pradeep Panda and Bina Agarwal. "Marital Violence, Human Development and Women's Property Status in India."

- Access to agricultural inputs: Likewise, the distribution and access to agricultural of inputs (seeds, fertilizers, pesticides) and human capital favours men and the differences in rights and responsibilities within the household bring about inefficient resource allocation and constrain women's ability to respond to price incentives.
- Access to technology: Mechanization of agriculture has resulted in confinement of women in low paying traditional works. Further, most farm machinery is difficult for women to operate and are not women friendly.
- Access to education, training and extension services: Access to education, agricultural training and extension services for women has been predominantly low as compared to men.
- Managing different roles: In addition to intensive work on the farm all day, women are also expected to fulfil domestic obligations like cooking, child rearing, water collection, fuel wood gathering, household maintenance, etc.
- Wage: Despite more work for longer hours when compared to male farmers, women farmers have lower wage rates and at times remain unpaid.
- Marketing: Small and marginal farmers in India lack adequate access to marketing facilities due to lack of basic infrastructure like market yards, roads and transportation, and storage including freezers and presence of middleperson. Additional constraints for women include seclusion, lack of literacy, knowledge and information. Further, women have no representation in agricultural marketing committees and other similar bodies.

Furthermore, women's engagement in agricultural production and marketing activities does not necessarily translate into increased incomes for them or improved decision making regarding the use of the income generated from agricultural activities (Dolan and Sorby 2003; FAO 2011). Women constitute only 20-30 percent of agricultural wage workers in modern agricultural value chains yet these chains usually offer wage and self-employment with better pay and working conditions than traditional agriculture (FAO, ILO and IUF, 2007).

- Decision making: Traditionally women are not involved in the decision making of land, selection of crop, selection of inputs (seeds, fertilizers & pesticides), credit, extension and market. Decisions are dominated by men in all activities.
- Violence: Violence and sexual harassment at workplace is a major issue faced by women agricultural labours and cultivators in India which mostly goes unreported.
- Health and Occupational Hazards: Women face health hazards in the cultivation of many crops and plantations due to lack of training, lack of protective gears and long working hours. Lack of nutritional security further perpetuates health issues.

### 10.2.2 Gender Division of Labour

The typical work of the female agricultural labourer or cultivator is sowing, transplanting, fertilizer application, weeding and harvesting, which often fit well within the framework of domestic life and child-rearing. In all activities there is an average gender wage disparity, with women earning only 70 percent of men's wage<sup>19</sup>. Additionally; many women participate in agricultural work as unpaid subsistence labour. Women contribute significantly in the production stage of value chain and in post-harvest operations like cleaning, sorting, grading and packaging but they are nearly invisible in the marketing stage of value chain.

### 10.2.3 Value-chain Analysis

The section is based on primary data analysis of two categories of women namely in male led CBOs and female-led CBOs, as shown in table below:

<sup>19</sup> [http://www.in.boell.org/downloads/Summary\\_agr.pdf](http://www.in.boell.org/downloads/Summary_agr.pdf)

**Table 64: CBO details with respect to female membership and social category**

| Type of CBO  | percentage of CBO | Female membership in the CBOs | Women headed households | Women board of director in the CBO | Women signatory in the board of directors | SC members | ST members |
|--------------|-------------------|-------------------------------|-------------------------|------------------------------------|-------------------------------------------|------------|------------|
| Women CBOs   | 25 percent        | 100 percent                   | 9 percent               | 100 percent                        | 100 percent                               | 10 percent | 8 percent  |
| General CBOs | 75 percent        | 21 percent                    | 4 percent               | 20 percent                         | 1 percent                                 | 4 percent  | 1 percent  |

Source: Field survey

The table shows increase in the percentage of women, in the women CBOs, economically active in agricultural sector either as self-employed or as agriculture wage workers or unremunerated family workers.

Several reasons are attributing to this trend, the most critical is levels of increasing poverty among rural community, which have forced women to work as agricultural labourers to supplement the family's income; women also work as unremunerated workers in family fields. Another reason is shift of men to casual work and to urban areas, because of agrarian distress. Large number of males are shifting from agriculture to casual work.

According to a 2013 report published in The Hindu, between 2001 and 2011, a total of 7.7 million farmers left agriculture. With rising shift of men from farm to non-farm activities, women are forced to work in agricultural and allied activities, however, their contribution goes unnoticed and unaccounted.

Mechanization of agriculture being another reason, wherein, due to increased mechanization of agriculture, men have moved to other non-farm activities, while women have been confined to traditional roles, such as: winnowing, harvesting, sowing seeds and rearing livestock.

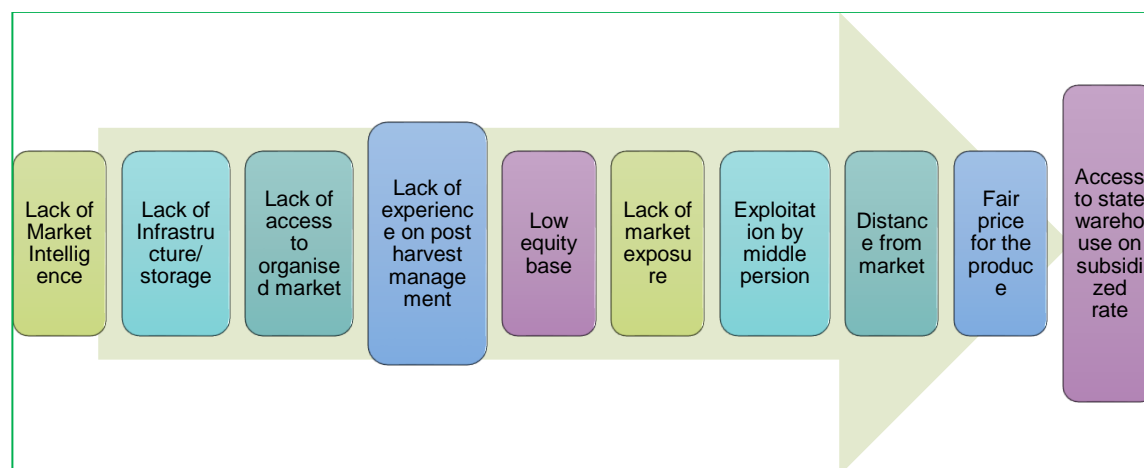
Despite globalisation, upward mobility of women for employment is still restricted and is further constrained by gender wage differentials. As per reports, about 33.7 percent of rural males migrate for reasons of employment and better economic opportunities. However, in the case of females, it is as low as 3.6 percent for rural females.

As per the stakeholder consultation and primary survey, it is found that the challenges are huge for women to the transition to high value agriculture (HVA) and agribusiness. Unlike men, women have the least access to and control of productive resources such as land, capital and agricultural services like credit and training. Likewise, the distribution of physical (land, agricultural equipment, and livestock) and human capital favours men and the differences in rights and responsibilities within the household bring about inefficient resource allocation and constrain women's ability to respond to price incentives. For instance, women have the least access to and control of productive resources such as land, capital and agricultural services like credit and training that are necessary for increasing yields and moving from subsistence to market oriented production. Likewise, the distribution of physical (land, agricultural equipment, and livestock) and human capital favours men and the differences in rights and responsibilities within the household bring about inefficient resource allocation and constrain women's ability to respond to price incentives.

The primary results show that the challenges are even higher in case of women only CBOs, wherein majority of women are found to be concentrated in the lower end of the chain and perform unskilled manual labour in high value agricultural value chains, lack access to organised markets, lack of infrastructure, exploitation by the middle-men, etc. are some of the common issues that women producer groups face. Poor financial portfolio, lack of technical expertise and experience in post-harvest management and marketing, adversely affects their prospects of bank loans. Further, women headed households are identified among the vulnerable group that would require special attention during the project implementation. A Gender Action Plan (GAP) has been prepared under the project to provided special assistance and allowance to women beneficiaries

to ensure their increased participation. The Figure 19 below depicts key challenges faced by women-led CBOs.

**Figure 19: Major challenges faced by women-led CBOs**

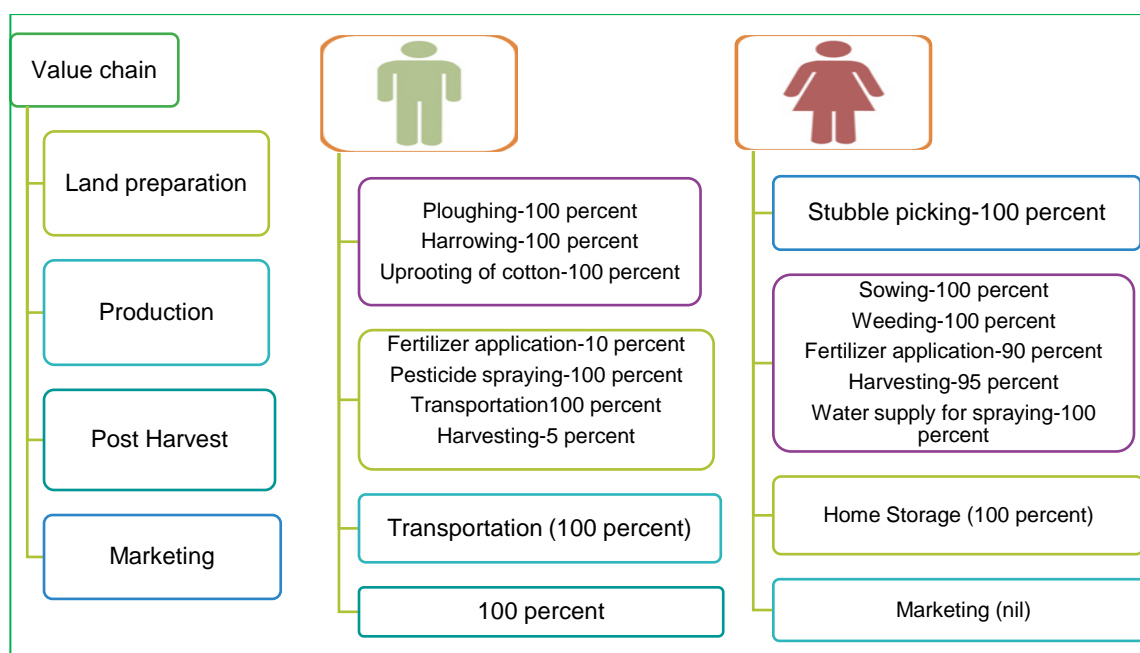


Source: Field survey

### 10.3 Gender Analysis of Value-chain






Attempt has been made to bridge the afore-mentioned gaps and come up with interventions that are tailored to the needs of smallholder women farmers, with a view to improving their access to and participation in markets for high value agricultural commodities as well as gains from such value chains. Cotton and okra value chains have been presented in this section as a case study, though, the analysis is true for most of the commodities. The focus is on women as one of the categories of gender because women and men are likely to be involved at different stages of the chain. Yet, those stages of the chain where women are involved are often less visible but may constitute critical links at which changes and/or upgrading should occur in order to bring about development of the chain. The figure below shows gender Division of labour and access and control over resources:

Women play a critical role in cotton cultivation. The analysis helps build an understanding of the gender division of roles and responsibilities in the farm, participating in decision-making and access to productive resources. The analysis includes building an understanding of current farm practices, the labour burden, and access to ecosystem support in the form of trainings, finance, extension services and government schemes. The analysis examines both the economic contributions of women cultivators on the farm and the various barriers that limit their role in cultivation.

**Figure 20: Gender division of labour for Cotton**

Source: Field survey

**Figure 21: Access and Control Over Resource- Cotton**

| Access                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                 | Control and Decision Making                                                                                                                                  |                                                                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                              |                                                                           |  |
| <ul style="list-style-type: none"> <li>Land</li> <li>Inputs (seed, fertilizer, pesticide)</li> <li>Credit</li> <li>Implements</li> <li>Extension Services</li> <li>Technology</li> <li>Warehouse</li> <li>Market</li> <li>Market Intelligence Services</li> </ul> | <ul style="list-style-type: none"> <li>Land</li> <li>Inputs (seed, fertilizer)</li> <li>Credit (only farm owner)</li> <li>Implements (limited access due to lack of women friendly equipment)</li> <li>Extension (limited to farm owner only)</li> <li>Technology (only farm owner)</li> <li>Warehouse (only farm owner)</li> <li>Market (Negligible access)</li> <li>Market Intelligence services Negligible access</li> </ul> | <ul style="list-style-type: none"> <li>Land</li> <li>Inputs</li> <li>Credit</li> <li>Implements</li> <li>Market</li> <li>Training</li> <li>Income</li> </ul> |   |

Source: Field survey

The results show that women are concentrated in the lower end of the chain and perform unskilled manual labour in high value agricultural value chains. Women are generally segregated in certain nodes of the chain that require relatively unskilled labour, are routine and require keenness and patience. This reflects cultural stereotypes on gender roles and abilities. For instance, women working in cotton value-chain are involved in sowing, stubble picking, fertilizer application and cotton picking. These activities require less physical energy but are time consuming, tedious and low paying. Men, on the other hand, are involved in carrying, manure and other inputs and land preparation, spraying which though are labour intensive, but are paying.

At the household level, women tend to be fully involved in the production and more women than men manage cotton (cent percentage women participation for storage at home), but they rely on

their spouses for capital and more men than women in male headed households tend to be involved in decision making on where and when to sell final produce.

The results from other commodity “Okra” indicate that in male headed households, men decide on the sale of okra of premium quality that goes to the export market while joint decision making is prevalent when the okra is of inferior grade. The okra of low quality is usually sold by women to consumers or small traders and the proceeds are generally low, hence the women tend to have control of the income. Likewise, joint decision making on how to use proceeds from any commodity (this pattern is common) appears to be common in households headed by men, and fewer women than men control proceeds in such households. Consequently, the results suggest that interventions geared towards enhancing the participation of women in the different stages of value chain at the household level will differ for the different categories of women and will depend on the degree of commercial orientation of the produce. For instance, women in female headed households, who are in most cases widowed, automatically assume the role of the household head and hence have access to and control of productive resources. This group of women can make decisions regarding production, marketing and use of the proceeds from avocado. Besides, this category of women is eligible to become a member of the avocado farmers group since they can assume ownership of the trees after the death of the husband. As such, integrating widowed women into the agricultural commodity markets, especially in the male dominated enterprises may only require alleviating constraints that limit their participation in such markets, such as financial constraints and inadequate access to market information, among other constraints, to make informed decisions.

The findings also suggest that more female than male producers tend to sell their produce to middleman/ brokers despite the low returns obtained from this category of buyer, suggesting that women are not necessarily chain owners. Similarly, more women in female headed households are found to sell their produce to brokers because middlemen offer instant payments in addition to meeting the cost of transportation, harvesting and grading. Furthermore, rejection rates are seen to be lower when the produce is purchased by middlemen than by the exporter, because brokers have several market options including traders and processors. Women in female headed households appear to be liquidity constrained, which affects the products quality. Exporters unlike brokers only cater for transportation of the produce to designated collection points, yet women in female headed households lack the cash to hire transport or labour to move the produce to the required collection points. This explains why the women prefer buyers like brokers who buy at the farm gate and do not select the produce. The women, however, seem to operate in a vicious cycle of limited capital and low productivity because of reliance on brokers. Therefore, strategies that aim at alleviating financial constraints such as linking this category of women to financial service providers is likely to facilitate their integration into the value chain.

On the other hand, women in male headed households (women in the general CBOs) whose husbands engage in other more lucrative activities may require a different approach to integrate them into the key stages of the value chain, particularly with regards to participation in export marketing and decision making on how to use proceeds from the produce. Under this circumstance, the women in most cases participate in providing labour or tending to the crop and only make decisions on marketing of the produce (such as okra) of inferior quality. Because men make decisions involving sales of okra of premium quality, women are left to collect the rejected pieces, which they sell to retailers in the nearby markets. Therefore, this category of women will need a multifaceted approach to integrate them into the export end of the value chain since they have limited control of the resources and skills required to produce good quality product. Likewise, these women are of major interest, particularly in the export chain, because the men by virtue of their gender, attend training on certification standards, including good agricultural practices, yet the women are the main managers of the crops.

The gender analysis of Okra, Turmeri and Soybean is presented in Appendix E.

Based on the above, the following is suggested:

- Analysing complex social issues surrounding intra-household resource allocation and gender relations for each commodity, while preparing PP and MAP
- Endorsement of PP and MAP by farmers
- Gender sensitization and gender analysis workshop to CBO directors/members
- Capacity building on certification standards, esp. for women CBOs
- Enhancement in marketing skills for women CBOs
- Women friendly equipment/implements
- Adequate financial support to women CBOs
- Training on post-harvest management practices like Food safety and personal hygiene, quality parameter, storage
- Training on better agricultural practices
- Enabling environment to women staff of CBOs including establishment of internal Sexual Redressal committee at CBO level

Based on the above analysis, the gender strategy drafted for the project is presented in the following.

#### 10.4 Gender Strategy

The significant aspect of the strategic approach for the SMART Project must be to increase women's participation in the higher levels of identified agri-value chains through inclusion in every component. Hence the following targets are suggested for inclusion:

- As indicated in the inclusion plan earlier, the project could commit to a target of minimum 30 percent all-women CBOs out of total CBOs formed
- Project could ensure minimum 20 percent women membership (shareholders) and 20 percent women on the board of directors across all FPOs selected to participate in the project by the end of the respective sub-project period

The gender interventions and actions in the Project would focus on three major areas:

1. Specific activities to achieve the strategic target
2. Gender Mainstreaming in the Project
3. Ensuring enabling environment for women at workplace.

The detailing of activities and budget must be mentioned in the Gender Strategy.



# 11 Construction Management Guideline

Construction related environmental impacts are anticipated during the expansion of existing warehouses / cold storage or setting up of new warehouses / Retail outlets by CBOs during the Project implementation as per requirements indicated in Component 1 and Component 2 of the SMART project. Construction management guideline will be applicable in case of any construction activity to be undertaken by the Project and shall be complied by the construction contractor hired under the SMART project.

## 11.1 Applicable Permits

- Environmental clearance under Environmental Protection Act 1986 as per Environmental Impact Assessment (EIA) Notification 2006 in case the built-up area exceeds 20,000 sq. m.
- Forest Clearances under Forest (Conservation) Act 1980 in case the construction activities include forest land.
- Coastal Regulation Zone (CRZ) clearance under the CRZ notification 2011 and its amendments if the construction activity includes CRZ area.
- Consent to Establish under Water Act 1974 and Air Act 1981 for construction of warehouse/ retail outlets/ cold storages.
- No Objection Certificate (NOC) from Pollution Control Board for operating D.G set during construction if any
- Layout plan approval from Concerned Local Authority for Local Bye Law Compliance.
- Building plan approval / construction commencement certificate from Concerned Local Authority.
- Approval for Usage of water from Water Resource Department or Central Ground Water Authority in case of Bore well usage.
- Permission for usage of Power from State Electricity Board / Power Distribution Company for power requirement during construction.
- Permission for storage of diesel for operating D.G set from Petroleum and Explosives Safety Organisation (PESO).
- In case of inevitable circumstances if felling of trees cannot be avoided, then permission shall be obtained from Concerned Forest Department prior to felling of trees.
- Pollution Under Control (PUC) certificate for all construction vehicles and equipment used for the construction activity.
- Registration under Building and Construction Workers (Regulation of Employment and Condition of Service) Act 1996

## 11.2 Environmental Management Plan

Environmental Management Plan (EMP) to be complied by the Contractor during the construction stage is as indicated in the table below.

**Table 65: Construction Stage – Environment Management Plan**

| Parameters    | Impacts                                                                                                                                                                                                                                                                                                                                                                                                   | Mitigation Measures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Air Quality   | <ul style="list-style-type: none"> <li>• Dust emission due to activities such as excavation and levelling.</li> <li>• Dust emission due to movement of vehicles at construction site.</li> <li>• Emission due to operation of construction machineries.</li> </ul>                                                                                                                                        | <ul style="list-style-type: none"> <li>• Impacts shall be temporary in nature and are expected to reduce gradually on completion of construction activity.</li> </ul> <p>Mitigation measures shall be:</p> <ul style="list-style-type: none"> <li>• Construction materials shall be transported to the site in covered trucks, where necessary.</li> <li>• Land clearing for construction site will be kept at the absolute minimum practicable.</li> <li>• Layout should be designed to minimize the removal of soil and vegetation</li> <li>• Topsoil removed will be preserved for later reinstatement purposes by piling it within and along the boundary of the site.</li> <li>• Dust suppression systems (water spray) shall be put into service as per requirement at the construction site.</li> <li>• Fuel used for machineries shall be clean and with low Sulphur content.</li> <li>• Construction machineries used shall have a valid PUC certificate.</li> <li>• Construction workers shall be provided with clean fuel for cooking.</li> <li>• Reducing speed of vehicle on Water Bound Macadam (WBM) road within the construction site to 20 km/hr will reduce dust emission.</li> <li>• Vehicles used shall be Bharat Stage V or VI compliant as per the prevailing regulations.</li> </ul> |
| Noise quality | <ul style="list-style-type: none"> <li>• Noise quality shall be impacted due to operation of construction machineries.</li> </ul>                                                                                                                                                                                                                                                                         | <ul style="list-style-type: none"> <li>• Provision of silencers to modulate the noise generated by machines</li> <li>• Provision of protective devices like ear muff/ plugs to the workers who will be working in the noise prone areas.</li> <li>• Acoustic enclosure to D.G set shall be provided if used.</li> <li>• Construction activity generating noise shall be limited to the day time</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Water Quality | <ul style="list-style-type: none"> <li>• Water shall be required during construction for dust suppression, construction activities such as concrete mixing, curing and for domestic usage by workers and staffs. Water quality impacts can be caused due to the following:</li> <li>• Waste water generated from temporary labour tents.</li> <li>• Rainwater run-off from construction sites.</li> </ul> | <p>Water Conservation measures such as the following shall be used:</p> <ul style="list-style-type: none"> <li>• Curing water shall be sprayed on to the concrete structures instead of free flow of water.</li> <li>• Concrete structures shall be covered with thick cloth/gunny bags to avoid water rebound and will ensure sustained and complete curing.</li> <li>• Mitigation Measures</li> <li>• Sewage generated shall be treated in septic tank followed by soak pits.</li> <li>• Silt traps shall be provided prior to discharge of run-off from construction area into drains.</li> <li>• An oil trap shall be provided in the drainage line to prevent contamination by accidental spillage of oil and grease.</li> <li>• Washdown area shall be provided for cleaning of vehicle wheels and the waste water shall be drained properly. Here also a settling pit and baffled oil water separator shall be provided.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                  |
| Soil Quality  | <ul style="list-style-type: none"> <li>• Construction waste generated during the construction activity.</li> <li>• Generation of municipal solid waste from workers camps.</li> <li>• Used oil generated from D.G set if applicable.</li> </ul>                                                                                                                                                           | <ul style="list-style-type: none"> <li>• Construction waste generated shall be collected, segregated and disposed as per the Construction and Demolition Waste Rules 2016.</li> <li>• Municipal solid waste generated shall be disposed as per Solid Waste Management Rules 2016.</li> <li>• Used oil generated shall be collected and sold to authorized recyclers.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

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|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Occupational Health and Safety        | <p>Contractor shall maintain a safe, healthy and hygienic work environment during the construction stage and shall comply with the IFC General EHS Guideline, April 2007. Some of the general measures to be adopted are as follows:</p> <ul style="list-style-type: none"> <li>● Workers at site shall be provided with clean drinking water as per BIS specification (IS 10500-2004).</li> <li>● Adequate drainage and waste disposal sites shall be provided at site.</li> <li>● Proper drainage shall be maintained around the sites to avoid water logging leading to various disease.</li> <li>● Adequate sanitation and waste disposal facility shall be provided at construction camps by means of septic tank, soakage pits etc.</li> <li>● Safety of workers undertaking various operations during construction will be ensured by providing appropriate Personnel Protective Equipment (PPEs) such as helmets, masks, safety goggles, safety belts, ear plugs etc.</li> <li>● At every work place, a readily available first aid unit including an adequate supply of dressing materials, a mode of transport (ambulance), nursing staff and an attending doctor will be provided.</li> <li>● Measures shall be taken to prevent breeding of mosquitoes at site.</li> <li>● The Contractor will organize awareness program on Human Immunodeficiency Virus (HIV), Acquired immunodeficiency syndrome (AIDS) and Sexually Transmitted Diseases (STDs) for workers on periodic basis.</li> <li>● Contractor shall comply with all the precautions as required for the safety of the workmen as per the International Labour Organization (ILO) Convention.</li> <li>● Contractor shall comply with all regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches &amp; safe means of entry &amp; egress.</li> <li>● Minimize significant hazards, where elimination &amp; isolation are both impractical.</li> <li>● Maintaining accident register at site to record and document occupational accidents, diseases and incidents, causes of the event along with corrective measures taken.</li> <li>● Emergence prevention, preparedness and response arrangements shall be prepared for the site</li> <li>● No child labour shall be utilized in the project.</li> <li>● The following Act shall be complied regarding manpower: <ul style="list-style-type: none"> <li>● Minimum Wages Act, 1948</li> <li>● Contract Labour (Regulation &amp; Abolition) Act 1970</li> <li>● Inter-State Migrant Workmen (Regulation of Employment &amp; Conditions of Services) Act, 1979</li> <li>● The Building and other Construction Workers (Regulation and Employment of Service) Act, 1996</li> <li>● The Building and other Construction Workers Welfare Cess Act, 1996</li> </ul> </li> </ul> |
| Design Elements for energy efficiency | <p>General measures that shall be adopted in the design for energy efficient and sustainable design of building for Warehouse, Cold Storages, etc. by Retailers / CBOs are as follows:</p> <ul style="list-style-type: none"> <li>● Building design shall utilize maximum natural daylight and rely minimum on artificial lighting.</li> <li>● Use low energy Light Emitting Diode (LED) lighting system to reduce their energy usage.</li> <li>● Waste management based on the concept of reduce, reuse and recycle shall be adopted to promote waste avoidance ahead of recycling and disposal.</li> <li>● Electrical / electronic equipment used in the facility shall be of 3 star and above rating.</li> <li>● Warehouse and Retails shall utilize solar energy for internal and external lighting to the extent possible.</li> <li>● Construction material to the extent possible shall be sourced locally to reduce carbon footprint.</li> <li>● Building material to the extent possible considering the design requirement shall utilize recyclable material such as fly ash bricks.</li> <li>● Refrigerator trucks shall be energy efficient and Bharat Stage VI and above compliant as per the prevailing norms.</li> <li>● Cold Storages and Retails shall use refrigerants that are environment friendly and non-ozone depleting and adhere to Ozone Depleting Substances (Regulation and Control) Rules, 2000 and its amendments.</li> <li>● HVAC (Heat Ventilation and Air Conditioning) system used shall be energy efficient.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

|                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Labour Camp and working condition | <ul style="list-style-type: none"> <li>● The contractor will provide safe working condition for the workers;</li> <li>● Contractor will maintain register of attendance of workers, register of grievance, accident recording system; <ul style="list-style-type: none"> <li>● Contractor will provide safe and hygienic condition in the labour camp; <ul style="list-style-type: none"> <li>● Separate toilet for women and men worker will be provided;</li> </ul> </li> <li>● Required personal protective equipment will be provided by the contractor; <ul style="list-style-type: none"> <li>● Safe drinking water supply will be provided in the labour camp;</li> </ul> </li> </ul> </li> <li>● Clean eating area will be provided at the construction site and labour camp; <ul style="list-style-type: none"> <li>● First aid box will be provided at the construction camp and labour camp; <ul style="list-style-type: none"> <li>● Creche will be provided in the labour camp for the kid of labours</li> </ul> </li> </ul> </li> <li>● Proper ventilated shed for living rooms will be provided in the labour camp; <ul style="list-style-type: none"> <li>● All labour shall be provided with Cots for sleeping;</li> </ul> </li> <li>● Necessary training will be provided to all workers prior to start of the work;</li> <li>● The labour camp will be set up at sufficient distance from community; and</li> <li>● Contractor will ensure that no conflict between labours and local community arise. This will be ensured by provided separate electricity connection, water supply and other dedicated facility to the labour camp which does not hamper the requirement of the local community.</li> </ul> |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Source: MM Analysis

### 11.3 Environmental Clauses for Bid Document

Environmental clauses to be included in the bid document are delineated in the subsequent subsections.

#### 11.3.1 Environmental Protection

- Contractor shall be responsible for implementation of Environmental Management Plan (EMP) in addition to adhering to all environmental provisions in applicable specification for the work as part of good engineering practices.
- All works undertaken towards protection of environmental resources as part of the EMP and as part of good engineering practices while adhering to relevant specifications will be deemed to be incidental to works being carried out and no separate payment will be made unless otherwise specified explicitly. The cost towards environmental management as per EMP unless otherwise provided as a separate head, will be deemed to be part of Bill of Quantity of the project. The Scope of Work (SoW) of the Contractor towards implementation of environmental provision shall be as follows:
  - Abide by all existing environmental regulation and requirements of the Government of India and State Government of Maharashtra during implementation.
  - Comply with all mitigation measure and monitoring requirements set out in the EMP.
  - Submission of methodology stating how EMP will be complied including method and schedule of monitoring.
  - Monitoring of project environmental performance and periodic submission of monitoring report.
  - Compliance with all measures required for construction activities in sensitive areas (if any), including protected areas, in line with the regulatory requirements adopted by MoEF&CC, Gol.
  - Compliance of all safety rules at work, and provision of adequate health and safety measures such as water, food, sanitation, personal protective equipment, workers insurance, and medical facilities.

#### 11.3.2 Construction Material

- The Contractor should procure construction materials from the licensed/ authorized agents/ dealers. Procurement of materials from the unauthorized sources shall be considered as illegal and appropriate measures shall be taken.
- Quarrying, if required in the project will be only from approved quarries and no new quarries will be opened for the project. Any deviation from the provisions will be immediately notified and approval of the Engineer must be sought.

- The Contractor shall maintain all borrow sites, stockpiles, and spoil disposal areas to assure the stability and safety of the works and that any adjacent feature is not endangered, and to assure free and efficient natural and artificial drainage, and to prevent erosion. Stockpiling of materials (topsoil, fill material, gravel and other construction materials) shall not be allowed during rainy season unless covered by a suitable material. Storage on private property will be allowed if written permission is obtained from the owner or authorized lessee.
- Construction and Demolition waste shall be handled as per the provisions laid down in the C&D Waste Management Rules 2016.

#### 11.4 Protection of Environmental Resources

- The Contractor shall ensure that construction activities do not result in any contamination of land or water by polluting substances.
- Unless otherwise provided in the specifications, the Contractor shall ensure that no trees or shrubs or waterside vegetation are felled or harmed except those required to be cleared for execution of the works. The Contractor shall protect trees and vegetation from damage to the satisfaction of the Engineer (Line Department).
- The Contractor shall not use or permit the use of wood as a fuel for the execution of any part of the works and to the extent practicable, shall ensure that fuels other than wood are used for cooking and heating in all camps and living accommodations. Any wood so used must be harvested legally, and the Contractor shall provide the Engineer with copies of the relevant permits, if required.
- The Contractor shall take all precautions necessary to ensure that vegetation existing adjacent to the project site is not affected by fires arising from the execution of the contract. Should a fire occur in the natural vegetation or plantation adjacent to the project site for any reason, the Contractor shall immediately suppress the same. Areas of forest, shrub, or plantation damaged by fire considered by the Engineer to have been initiated by the Contractor's staff or laborers shall be replanted or otherwise restored.
- The Contractor shall confine operations to the dry season, use silt traps and dispose spoils/debris in locations approved by the Engineer that will not promote instability and result in destruction of property, vegetation, irrigation and water supply. Disposal near wetlands/ beels, protected areas, and other areas that will cause inconvenience or deprive residents of their livelihood shall not be allowed. Acidic and saline spoils shall not be allowed into agricultural land.
- The Contractor shall consult with residents and local government before locating project offices, sheds, and construction plant. The work camps shall not be located near settlements, near drinking water supply intakes, protected areas, or wildlife habitats.
- The Contractor shall maintain ecological balance by preventing felling of trees, water pollution and defacing of natural landscape. The Contractor shall, so conduct his cleaning operations, as to prevent any avoidable destruction, scarring or defacing of natural surroundings. In respect of ecological balance, the Contractor shall observe the following instructions.
- In the conduct of cleaning activities and operation of equipment, the Contractor shall utilize such practicable methods and devices as reasonably available to control, prevent and otherwise minimize air/water/noise pollution.

##### 11.4.1 Noise and Water Pollution

- All works shall be carried out without unreasonable noise and air pollution. Subject and without prejudice to any other provision of the Contract and the law of the land and its obligation as applicable, the Contractor shall take all precautions outlined in the EMP to avoid the air and noise pollution.
- The Contractor shall monitor the environmental parameters periodically as specified in the monitoring plan and report to the Engineer.

- The Contractor shall indemnify and keep indemnified the Employer from and against any liability for damages because of noise or other disturbance created while carrying out the work, and from and against all claims, demands, proceedings, damages, costs, charges, and expenses, whatsoever, in regard or in relation to such liability.

#### **11.4.2 Occupational Health and Safety during Construction**

The Contractor shall, in accordance with the safety and health provisions specified in the EMP, provide workers with a safe and healthy working environment, in the work areas, through application of preventive and protective measures consistent with international good practice, as reflected in internationally recognized standards such as IFC EHS guidelines.

#### **11.4.3 Post Construction Clearance**

On completion of work, wherever applicable, the Contractor shall clear away and remove from the sites all constructional plant, surplus materials, rubbish, scaffoldings and temporary works of every kind and leave the whole of the site and works in a clean condition to the satisfaction of the Engineer.

Construction camp sites post construction shall be cleared as specified in the EMP and handed over to the Owner. It will be ensured by the contractor that the site handed over is in line with the conditions of temporary acquisition signed by both parties.

## 12 Good Industrial Practice – Slaughter house

The existing or the new Slaughter house's which is planned to be supported by SMART Project shall comply with Good Industrial Practices as indicated in the subsequent subsections.

### 12.1 Applicable Slaughtertehouse License Requirements

- FSSAI License for slaughterhouse under the Food Safety (License and Registration of food Business) Regulation 2011.
- Consent to Establish and Consent to Operate under Air Act, 1981 and Water Act, 1974 prior to construction and operation respectively.
- Permission for usage of Water from Water Resource Department or Ground Water Authority in case of ground water usage.
- Permission for usage of electricity from State Electricity Board
- Layout plan approval from Concerned Local Authority.
- Layout plan approval under Factory Act, 1948 and License under Factory Act prior to operation.

### 12.2 Pre-slaughter Handling

- Healthy animals free from diseases should be transported to the slaughter house.
- The transported animals should be in groups of preferably same sex and age to avoid belligerence due to their social behaviour.
- The vehicles should be thoroughly disinfected with a suitable disinfectant before loading the animals. Thereafter clean sand layer of about 6 cm should be provided to prevent injuries to the animals
- Enough space shall be provided to animals while transporting. BIS specification for space in transportation vehicle for sheep and goat are as indicated below:

**Table 66: Space Requirement – Transportation of Animals**

| Approximate Weight of Animal in kg | Space requirement in sq. m |
|------------------------------------|----------------------------|
| Up to 20                           | 0.16 – 0.17                |
| 20 – 35                            | 0.18 – 0.19                |
| 26 – 29                            | 0.22 – 0.23                |
| 30 – 39                            | 0.25 – 0.27                |
| More than 40                       | 0.29 – 0.32                |

Source: BIS Specification, APEDA Executive Manual Series Volume 2

Vehicles carrying animals for slaughtering into the black zone shall be disinfected to prevent bacterial contamination in the slaughter house.

### 12.3 Layout Requirements

- Layout must have built-in biosecurity with two zones clearly demarcated as black zone and white zone and there should be no cross movement of animals.
- Animals should be registered and tagged in the unloading area and there after kept in covered resting pen. The detailed examination of the diseased animals should be done in the isolation pen.
- Plant should have lairage, race, abattoir hall, slaughter lines, chillers, deboning and packing area, freezing and cold storage.

- Mechanism for identification and traceability should be adopted to be enforced at various stages with assignment of the batch number.

#### 12.4 Slaughtering Requirements

- Animals to be slaughtered shall be kept in pen for 24 hr with adequate water and shade to alleviate the stress during transport and for ante-mortem examination by qualified veterinarian and suspected animals shall be kept in isolation pens.
- Space for resting shall be 0.8 sq. m per goat.
- The slaughtering of animals should not be done in the sight of slaughtered animals.
- It should be done by Halal method with Islamic Shariyat in case producing halal meat with a sharp knife which should cut carotid vein, carotid artery, trachea and oesophagus in one incision. It should not cut the spinal cord.
- The carcass after slaughtering is hanged to bleed for 5-6 minutes and then dressing is done on the slaughter line. It should not be done on the floor.
- The hide is pulled by the de-hider and hide is then pushed through the chute at a place for keeping the hides. Thereafter the carcass be split in two and eviscerated.
- Floor of the abattoir should be hard, impervious and anti-slippery to check contamination. Internal walls should be impervious and glazed to a height of 2 m in case of sheep and goat.
- Facility shall have provision for cold and hot potable water in sufficient quantity for washing of carcasses.
- There should be efficient drainage and disposal of edible and non-edible offal.
- The blood should be collected in an under-drainage facility/tank.
- After the carcasses have been inspected and passed, they are washed with hot water and sanitized with 20 PPM of Chlorine.
- Adequate facilities are provided for cleanliness of food contact surfaces namely floor, wall, knives, hooks, plastic crates, equipment and table tops. The abattoir and deboning area are cleansed and washed with detergents and hot potable water (65°C).
- Continuous and thorough washing is always carried out in the slaughtering area.
- Any carcass/part of carcass rejected is immediately passed onto the Rendering plant through a separate chute.
- Suitable and separate space is provided for the storage of skin and hides.
- A Constant hot water supply (82°C) should be ensured in both the Deboning and Slaughter hall.
- Samples shall be taken randomly daily from different tables and meat cuts for the microbiological examination.
- Proper cuts should be packaged in cartons which has labels indicating the product, date of manufacturing, shelf life, brand name, etc to provide the consumer the information about the contents. Thereafter, the packed cartons are passed through the metal detector before freezing the meat either in plate freezer/blast freezer.

#### 12.5 Laboratory / Testing Facility

In-house microbiological laboratory with sterilization room, media preparation room, incubation room, laminar flow and washing room must be provided to do the microbiological examination of meat, water, air and personnel working in the plant.

## 12.6 Effluent Treatment Plant

Effluent generated in the slaughter house shall be treated in Effluent Treatment Plant (ETP). ETP shall be based on suitable biological treatment based of the characteristics of the effluent generated. Usually the effluent from slaughter house has high organic and nitrogen load and extended aeration is effective option. Treated effluent shall be disinfected prior to discharge.

Best Available Technology has been recommended by CPCB vide Comprehensive Industrial Document for slaughter house dated Oct 2017 which includes:

- Primary treatment with screens, dissolved air flotation, oil and grease traps, primary settling and coagulation.
- Secondary biological treatment with up flow Anaerobic Sludge Blanket / Rotating Biological Contactor / Activated Sludge Process followed by secondary settling.
- Tertiary treatment using pressure sand filter, activated carbon filter and final disinfection with ozone
- Sludge generated shall be handled using anaerobic digester.

Treated effluent shall comply with discharge standards stipulated by MoEF&CC vide Notification dated 28<sup>th</sup> Oct 2016 as indicated in the table below:

**Table 67: Effluent Discharge Standards Stipulated by MOEF&CC**

| Parameter                                                     | Standard  |
|---------------------------------------------------------------|-----------|
| pH                                                            | 6.5 – 8.5 |
| Biochemical Oxygen Demand (BOD) [3 days at 27 <sup>o</sup> C] | 30 mg/l   |
| Chemical Oxygen Demand (COD)                                  | 250 mg/l  |
| Suspended Solids                                              | 50 mg/l   |
| Oil and Grease                                                | 10 mg/l   |

Source: CPCB, Effluent Discharge Standard Slaughterhouse, 28.10.2016

## 12.7 Solid Waste Management

Central Pollution Control Board recommends best practicable method for processing and disposal of different waste from slaughter houses as indicated in the table below.

**Table 68: Processing and Disposal of Slaughter House Waste**

| Type of Waste | Constituents of the waste                                                                         | Category of Slaughter house | Method                                                              |
|---------------|---------------------------------------------------------------------------------------------------|-----------------------------|---------------------------------------------------------------------|
| Type 1        | Vegetable matter such as rumen, stomach and intestinal content, dung and agricultural residue     | Large                       | Bio-methanation                                                     |
|               |                                                                                                   | Medium                      | Bio-methanation or composting                                       |
|               |                                                                                                   | Small                       | Bio-methanation or composting                                       |
| Type 2        | Animal matter such as inedible, offal tissue, meat, trimmings, waste and condemned meat and bones | Large                       | Rendering                                                           |
|               |                                                                                                   | Medium                      | Rendering or composting with type 1 waste                           |
|               |                                                                                                   | Small                       | Composting with type 1 waste or burial as per provisional measures. |

Source: CPCB, Characterization, Waste Management Practice and Best Available Pollution Control Technologies in Slaughterhouse, 23.10.2017

## 12.8 Employee Health Condition

- Employees should have good health and shall be properly attired with aprons, head wears, mouth mask, hand gloves and clean gum boots. A changing room should be provided for workers.
- Separate changing room and clean toilets with sanitation facility shall be provided for male and female employees.
- Facilities such as lockers, canteen, prayer room, first aid room shall be provided.
- Entire facility shall be well lit by natural and artificial lighting and the bulbs shall be covered to avoid contamination of meat in case of breakage.
- Health of the workers should be thoroughly checked every 6 months on routine basis and record shall be maintained for the medical check-up of each worker who handles meat. The plant shall be equipped with first aid facility.
- Employees should be inoculated against enteric disease like cholera, typhoid and tuberculosis once in a year and record shall be maintained.

## 12.9 Exclusion of Pest

- Slaughter house and its surroundings shall be insect and pest free.
- Different pest control measures shall be adopted such as rat traps in switch room, air curtains shall be placed at each entry point of the utility building.
- Automatic closing windows (chutes) are provided in the slaughter hall to deliver the rejected carcasses for rendering. Chutes are also provided in the bone room. This prevents the entry of birds and other flying objects to enter in the deboning /slaughter hall.
- Nuvan, an insecticide shall be regularly sprayed throughout the utility building.
- Regular cleaning of toilets and using of naphthalene balls in it prevents the entry of flies and mosquitos into the plant.

# 13 Guidelines on Clearance Procedure for Food and Agricultural Propagation Material Imports to India

## 13.1 Food Import Regulation

Food Imports into India are regulated by a separate import regulation by Food Safety and Standard Authority of India (FSSAI) called the Food Safety and Standard (Import) Regulation 2017 notified on 9<sup>th</sup> March 2017. The regulation provides detailed procedure and guidelines to regulate food imports to India. The procedure includes the following:

- Licensing of Food Importers
- Clearance process of Imported food
- Import clearance for specific purpose
- Storage and sampling of imported foods
- Laboratory analysis of samples of imported articles of food
- Prohibition and Restriction on Import of articles of food
- Officers of Food Authority and their powers and Duties
- Disposal of rejected food consignment and food samples
- Treatment of unclear and unclaimed articles of food

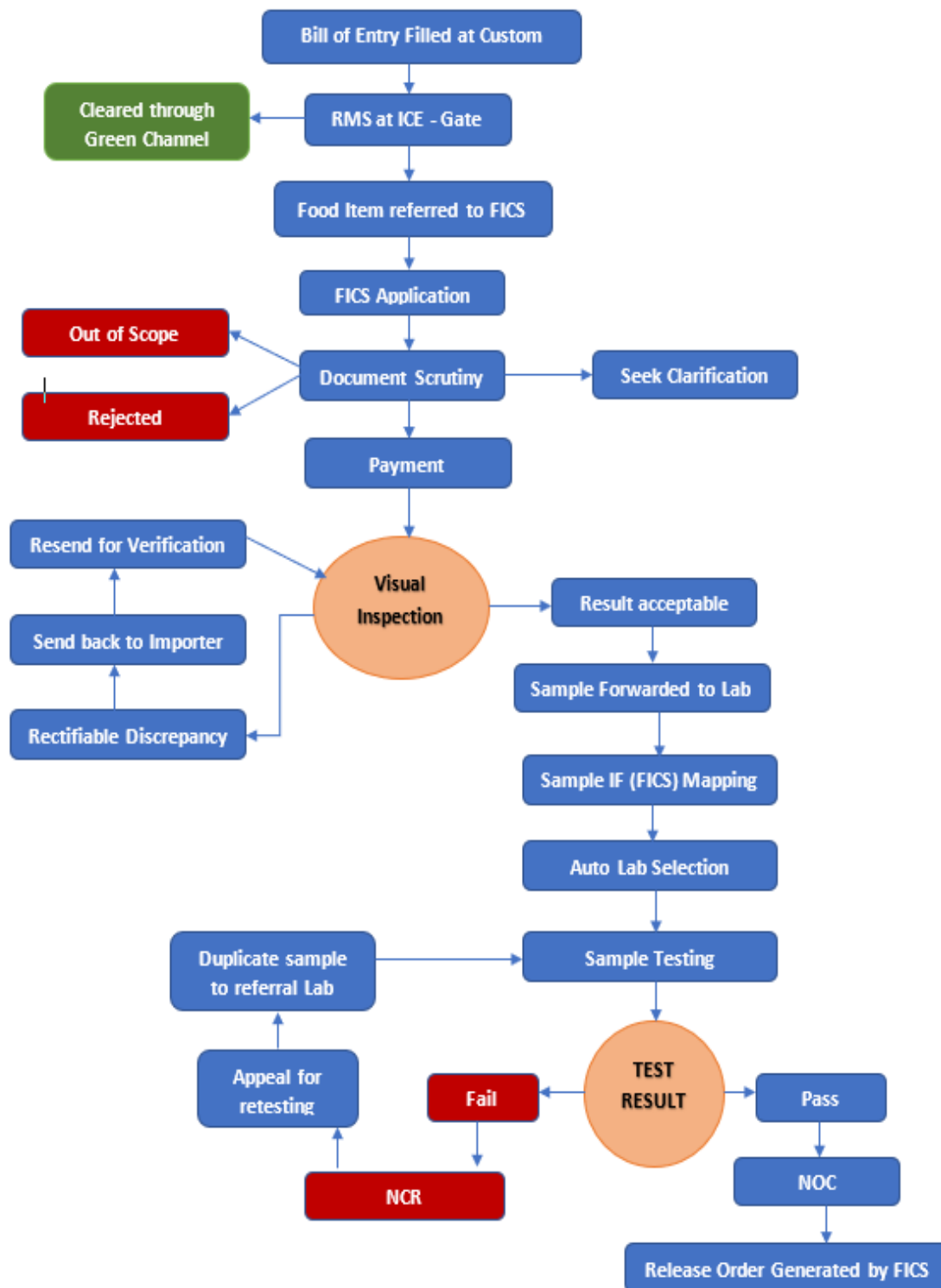
## 13.2 Food Import Clearance Process

FSSAI has its own Food Import Clearance System (FICS) which is an online system integrated with the customs ICE – Gate (Indian Custom Electronic Commerce Gateway) under Single Window Interface for Facilitating Trade (SWIFT). Customs department implement Risk Management System (RMS) under SWIFT in consultation with other Participating Government Agency (PGA) including FSSAI.

- After referring the application by Customs in FICS, initial scrutiny is done by FSSAI
- Initials scrutiny will be based on the review of documents
- After initial scrutiny and deposition of fee, visual inspection is done by FSSAI on physical condition, packing and labeling of the food item.
- On satisfactory visual inspection report samples are drawn for laboratory analysis.
- NOC / NCR is issued based on the test results to take further necessary action regarding release / further disposal of import consignment.
- In case rejection, if the importer is not satisfied with the order passed by the Review Officer, then he can challenge the said decision before the CEO, FSSAI whose decision thereon will be final.

Food Import Clearance steps are as indicated in the figure below:

Figure 22: Food Import Clearance Procedure



Source: Manual for Food Imports, FSSAI, 8.11.2017

Some of the Key highlights of the FSSAI Import Regulation 2017 are as indicated below:

- No person can import any article of food without import license from the Central Licensing Authority in accordance with the provisions of Food Safety and Standard (Licensing and Registration of Food Business) Regulation, 2011.
- Food Importer shall register himself with the Directorate General of Foreign Trade and possess valid import and export code.
- No article of food shall be cleared from the customs unless it has a valid shelf life of not less than 60 percent at the time of import.
- Relaxation has been provided for labelling and packaging for pre-packed foods including multi piece packaging, whole sale packages, primary foods like food grain, pulses, dry fruits etc. imported in packages, primary food like food grain, pulses, dry fruits etc. imported in loose in bulk.
- Provision has been made for Provisional NOC in Form 12/13 for imported items having very short shelf life and require special storage such as fruits and vegetables, processed cheese and frozen food items etc. to allow them to be move consignment to respective warehouse, however release to market will be allowed only after issuance of NOC by FSSAI.
- For combined cargo of pulses and other cereals and oils, the analysis report of the sample drawn at the first port of discharge shall also remain valid at other port of discharge provided the Authorized Officer reseals the remaining cargo at the first port of discharge.
- For import of high prices liquor, miniature sample of 100 ml can be taken for laboratory analysis subjected to condition that imported consignment is accompanied with Certificate of Analysis by export country.
- In case of consignment of food import consisting of more than one product, food products may be considered for clearance separately based on its compliance to the Import. Food for personal use will require a declaration in Form 7 of FSSAI Import Regulation 2017.
- Food imported by diplomatic mission shall be dealt in accordance to Vienna Convention on Consular Relation, 1963.
- Import of Food for Quality Assurance, Research and Development purpose shall require an undertaking in Form 9 to the regulation by importer stating that it is for testing and R&D and not for market release.
- Food imported for the purpose of exhibition and testing shall require an undertaking in Form 10 of the FSSAI Import regulation 2017 before Customs Authority.
- Import of Food for sports events will be subjected to furnishing of undertaking in Form 11 of the regulation by the food importer.
- Import of food consignment meant for 100 percent export or re-export would require a declaration by the importer that it's for 100 percent export and no part thereof shall be supplied for domestic consumption.
- High risk items for which 100 percent sampling is done are meat and meat products, fish and fish products, egg and egg products, milk powder, condensed milk, milk cereal base weaning foods, Infant milk food, infant formulae, fat in any form except edible vegetable fat and cocoa butter equivalent or substitutes.
- Animal quarantine and Plant Quarantine department under the Ministry of Agriculture also take sample separately in case of certain food items marked by customs for their NOC. The analysis done by FSSAI for food items are different parameters and NOC by FSSAI does not mean the same is cleared by Plant / Animal quarantine and vice-versa.
- FSSAI handles food import consignments in 6 ports viz. Chennai, Mumbai, Kolkata, Delhi, Kochi and Tuticorin. For testing of food import consignment there are 142 National

Accreditation Board for Testing and Calibration Laboratories (NABL) accredited laboratories notified by FSSAI throughout the Country. Mumbai and its suburbs have 12 labs attached to FICS. FSSAI has also notified 16 referral labs other than the 142 for re-testing of appeal samples of the importers.

### 13.3 Import of Seed / Plant Material for Sowing, Planting and Propagation

- Importer needs to apply for permit for import of seed / plant material for sowing, planting and propagating at least seven days in advance to the permit from Issuing Authority notified under Plant Quarantine (Regulation of Import to India) Order 2003.
- All the consignment of seed and plants for propagation shall be imported only through seaport, airport and land frontier Stations listed in Schedule I to the Act.
- List of commodities for which import permit shall be granted are listed in Schedule V, VI and XII of the Order.
- Importer shall apply for permit along with demand draft, catalogue/invoice and registration certificate issued by National Seed Corporation or Director of Horticulture / Agriculture.
- Import permit shall be valid for a period of 6 months and shall be valid for multiple port access and multiple part shipment provided the exporter, importer and country of origin are the same for the entire consignment.
- Import permit are non-transferable and no permit will be issued for landed consignments.
- Pest Risk Analysis is mandatory for import of new commodities into India. Hence, for import of new commodities the importer should apply for Pest Risk Analysis Request Form to the Plant Protection Adviser to the Govt. of India.
- The Director, National Bureau of Plant Genetic Resources (NBPGR) is authorised to issue permits of PQ Order, 2003 for import of germplasm / Research and breeding material for public / private sector in the country including institutions and organisations of Indian Council of Agricultural Research (ICAR), State Agricultural Universities (SAU) and International Crop Research Institute for Semi-Arid Tropics (ICRISAT).
- The importer or his agent shall apply for import of Live Insects, algae, mushroom, bio control agents and Microbial cultures intended for agricultural use, to the Plant Protection Advisor (PPA), Government of India.
- Permit for import of soil, earth, clay, peat and sphagnum moss and similar material for any microbiological, soil-mechanics, or mineralogical investigations and peat for horticultural purposes shall be applied to the Plant Protection Advisor (PPA), Government of India.
- In the event of live insect infestation is noticed, the importer or his agent shall arrange for fumigation of consignments by an approved pest control operator at his own cost under the supervision of Plant Quarantine (PQ) officer.
- The importer or his agent shall arrange for inspection/sampling of the consignment on the scheduled date & time at the prescribed place by the nominated plant quarantine officer as per the quarantine order issued. Sampling of seed for propagation shall be in accordance with the International Seed Testing Association (ISTA) Rules, 1976 and of cereals, pulses, oil seeds, dry fruits etc., and for consumption plant materials as per Bureau of Indian Standards ((method of sampling for smaller size food grain IS: 2814/1978 and (method of sampling for bigger size food grain) IS: 3714/1978)).
- Any person desiring to import or manufacture any insecticide may apply to the Registration Committee for the registration of such insecticide and there shall be separate application for each such insecticide Under Insecticides Act, 1968 and Rules, 1971.

## 14 Pest Management Plan

Insecticides, fungicides and herbicides are the commonly used agrochemicals. India is the fourth largest global producer of agrochemicals after the US, Japan and China. This segment generated a value of USD 4.4 billion in FY15 and is expected to grow at 7.5 percent per annum to reach USD 6.3 billion by FY20. Approximately 50 percent of the demand comes from domestic consumers and the rest from exports. During the same period, domestic demand is expected to grow at 6.5 percent per annum and exports at 9 percent per annum<sup>20</sup>.

Per hectare consumption of pesticides was highest in Punjab (0.74 kg), followed by Haryana (0.62 kg) and Maharashtra (0.57 kg).

Bio-pesticide have the potential to control crop losses and reduce negative environmental externalities. Bio-pesticides constitutes around 3 percent of pesticide market in India. So far only 14 biopesticides have been registered under the Insecticides Act, 1968 in India. Consumption of bio-pesticides has increased from 219 MT in 1996-97 to 683 MT in 2000-01 and further to around 5635 MT in 2015-16<sup>21</sup>.

Consumption of chemical and bio-pesticides in the state of Maharashtra are as indicated in the table below.

**Table 69: Use of Pesticides (in MT)**

| Year    | Chemical Pesticides | Bio-Pesticides |
|---------|---------------------|----------------|
| 2015-16 | 11,665              | 1173           |
| 2016-17 | 13,496              | 1454           |
| 2017-18 | 15,568              | 1271           |
| 2018-19 | 15,705              | 2252           |

Source: Economic Survey of Maharashtra 2017-18

Regarding the pesticide share across agricultural crops, cotton account for 30 percent followed by rice chillies/vegetables/fruits, plantations, cereals/millets/oil seeds, sugarcane and other. Figure below indicates crop wise pesticide share in India.

Pest Management Plan shall be adopted by members of the CBOs to be supported under SMART. Pest control materials should be selected and applied in a manner that minimizes risk to human health, beneficial and non-target organism and the environment.

Fertilizers are natural and artificial substance containing the chemical element that improve growth and productiveness of plant. Fertilizer enhance the natural fertility of the soil or replace the chemical element taken from soil by previous crops.

The type of fertilizer used in India are Straight nitrogenous fertilizers such as Ammonium Sulphate, Calcium Ammonium Nitrate, Ammonium Chloride and Urea, Straight phosphatic fertilizers such as single super phosphate and triple super phosphate and NP / NPK complex Fertilizers such as urea, ammonium phosphate, ammonium phosphate Sulphate, Diammonium

<sup>20</sup> Next Generation Indian Agriculture – Role of Crop Protection Solutions; A Report on Indian Agrochemical Industry July 2016

<sup>21</sup> Subhash SP, Prem Chand, Pavithra S, Balaji SJ and Suresh Pal, Pesticide Use in Indian Agriculture: Trend, Market Structure and Policy Issues.ICRA

phosphate (DAP), Mono ammonium phosphate (MAP), Nitro phosphate, Nitro phosphate with potash, NP / NPKs

In Maharashtra more than 50 percent of soil is deficient in zinc and deficiency of iron and manganese is also apparent in many districts. Maharashtra ranks third with a share of 11 percent in all India consumption of fertilizers. Per hectare consumption of fertilizers in Maharashtra is 126 kg as on 2012-13.

#### 14.1 Area under IPM in Maharashtra

Crop Pest Surveillance and Advisory Project (CROPSAP) was implemented with the funding through RKVY of Central Government till 2012 followed by Government of Maharashtra from 2013. Main objective was to implement scientific pest surveillance approach for pest management and creating mass awareness among field functionaries and farmers on IPM. Under this program nearly 44,000 villages across 348 talukas of 34 districts from among eight agricultural divisions of Maharashtra were covered. The area under each crop fluctuates with seasons with soybean among kharif crops and chickpea of Rabi showing marked increase in area under cultivation during 2014-15. As per the 2014-15 statistics, area under each target crop covered are as indicated below.

**Table 70: Area of cultivation of the target crops in Maharashtra under CROPSAP (area in lakh Ha)**

| Crop       | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | 2014-15 |
|------------|---------|---------|---------|---------|---------|---------|
| Soybean    | 30.19   | 27.29   | 30.10   | 30.64   | 35.20   | 36.40   |
| Cotton     | 33.92   | 39.42   | 41.67   | 41.87   | 41.60   | 41.90   |
| Rice       | 14.50   | 14.86   | 15.16   | 15.28   | 15.68   | 15.08   |
| Pigeon pea | 10.93   | 13.02   | 12.33   | 12.14   | 11.41   | 12.10   |
| Chickpea   | 12.91   | 14.38   | 10.75   | 11.35   | 18.20   | 14.27   |
| TOTAL      | 102.45  | 108.97  | 110.01  | 111.28  | 122.09  | 119.75  |

#### 14.2 Pest Management Strategy

Pest management strategy is based on the principle of managing the pest rather than eradicating them. Pesticides shall be used only as the last resort if the damage reaches Economic Threshold Level. Only permitted pesticides as per Indian regulation and WHO recommendations shall be used. The available techniques for controlling pests are categorized in the increasing order of their complexity as follows:

**Cultural practices:** Use of resistant variety, crop rotation, crop refuse destruction, Tillage of soil, variation in the time of planting and harvesting, pruning or thinning and proper spacing, judicious and balanced use of fertilizers, crop sanitation, water management, planting of trap crops.

**Mechanical Method:** Hand destruction, exclusion by barrier, use of traps

**Physical Method:** Application of heat by hot water treatment, exposing of infested grain to sun, super heating of empty go-down at 50<sup>o</sup> C to kill hibernating stored grain pest. Manipulation of moisture and light traps.

**Biological Method:** Protection and encouragement of natural enemies, Introduction, artificial increase and colonization of specific parasitoids and predators. Propagation and dissemination of specific bacterial, viral, fungal and protozoan disease.

**Genetic Methods:** Use of sterile male technique

**Regulatory methods:** Plant quarantine which includes both foreign and domestic quarantine.

**Chemical Methods:** Use of attractants, repellants, growth inhibitors and use of insecticides.

IPM Strategy for Key Pest in Major Crops in Maharashtra are as indicate in the table below:

**Table 71: IPM Strategy for Key Pest in Major Crops of Maharashtra**

| Name of Crop | Name of Pest                                | IPM Measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Responsible organisation / PIU                                                                                                                                                                                           |
|--------------|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cotton       | Boll worm/<br>Helicoverpa /<br>Sucking pest | <ul style="list-style-type: none"> <li>● Use certified seeds</li> <li>● Resistant variety such as Eknath, Purnima, Y -1, Malgari, Khandwa-2, Badnawar-1, G-cot -12, Jaydhar, NHH-1, NHH- 44, AKO-81, LRK 516</li> <li>● Cultural Practices such as summer deep ploughing to expose insect, pathogen and nematode population.</li> <li>● Sowing time up to June 30th and avoid late sowing.</li> <li>● Biological Control such as Seed treatment Trichoderma spp. @ 4 g / kg. or Captan 3 g / kg of seed or carbendazim 2 g / kg seed.</li> <li>● Seed treatment with imidachloprid 70 WS * @ 5 g / kg of seed in case of non – hybrid variety and 10 g / kg in case of hybrid or hiomethoxam 5 g / kg seed or carbosulfan 25 DS @ 50 gms / kg of seeds for early sucking pests.</li> <li>● Avoid overuse of Nitrogen fertilizer as crop becomes more susceptible to pest and diseases</li> <li>● Handpicking and destruction of various insects' stages affected parts and flower. Clipping of terminal shoots on 90 – 110 days depending on cultivars.</li> <li>● Use traps such as pheromone traps, sticky trap.</li> <li>● Ensure regular surveillance to detect Economic Threshold level.</li> <li>● If pest population attains ETL then select effective pesticide with recommended dosage and correct spray technology.</li> <li>● Allow grazing by animals after harvest or use crop residue as farm yard manure or sell to paper industry.</li> <li>● Avoid stacking of cotton stalk near fields and destroy the opened bolls if any on plants before stacking.</li> <li>● Crushing of cotton seed to be complete by April end.</li> </ul> | <ul style="list-style-type: none"> <li>● Department of Agriculture will implement the Pest Management Plan.</li> <li>●</li> <li>● Monitoring – Semi-annually by PCMU/RIU/DIU</li> </ul>                                  |
| Rice         | Yellow Stem borer                           | <ul style="list-style-type: none"> <li>● Resistant varieties Ratna, Sasyasree, Vikas, HKR 46, NDGR 21, Pantdhan 6, VLK 39, Prahlad, Birsadhan 201, Bhudeb Ainesh, Matangini, Radha, Sudha, Amulya, Bhagirathi, Jogan, Mandira, Nalini, Sabita, VL16 and VL 206.</li> <li>● Clipping the tips of seedlings before transplanting greatly reduces the carryover of eggs from the seedbed to the transplanted fields.</li> <li>● Rice varieties with short stature and shorter growth duration periods suffer less damage than long growth duration varieties.</li> <li>● Rice – rice with shorter growth duration varieties suffer less damage than long duration varieties.</li> <li>● Community-wide destruction of diapausing larvae (in stubble) through tillage after harvest, followed</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <ul style="list-style-type: none"> <li>● Department of Agriculture will implement the Pest Management Plan.</li> <li>●</li> <li>●</li> <li>●</li> <li>●</li> <li>● Monitoring – Semi-annually by PCMU/RIU/DIU</li> </ul> |

| Name of Crop | Name of Pest                              | IPM Measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Responsible organisation / PIU                                                                                                                                           |
|--------------|-------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |                                           | <p>by flooding, reduces stem borer populations resulting in low incidence in the next crop.</p> <ul style="list-style-type: none"> <li>Planting or seeding times may be delayed avoiding the peak emergence of moths from the diapausing populations.</li> <li>Rice seedbeds may be used as a trap crop for moths emerging from diapause.</li> <li>Using physical traps such as pheromone trap @ 5 traps per Ha, light traps sweep net water pan.</li> <li>Economic Threshold limit for Yellow stem borer is 1 egg mass / m<sup>2</sup>.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                          |
| Soybean      | Tobacco Caterpillar / Green Semi looper / | <ul style="list-style-type: none"> <li>Resistant varieties such as JS 81-21, PS 564 and PK 472 / NRC 7, NRC 37, PUSA 16, PUSA 20, PUSA 24, JS 93-05, JS 97-52, MAUS 47 and JS 80-21.</li> <li>Do not sow seeds beyond 5-7 cm depth.</li> <li>Keep soils covered year-round with living vegetation and/or crop residue.</li> <li>Fertilizer NPK and S at the rate of 20:60-80: 30-40:20 kg/ Ha should be applied.</li> <li>Seed treatment by Trichoderma viride @ 5g or thiram 37.5 percent + carboxin 37.5 percent DS @ 3 g/kg seed for the management of seed, seedling and seed borne foliar diseases. This should be followed by seed treatment with Bradyrhizobium and Phosphate Solubilizing Bacteria (PSB) @ 5 + 5 gm / kg seed</li> <li>Erection of bird perches @ 10-12/Ha</li> <li>Use of Castor as trap crop for tobacco caterpillar.</li> <li>Pesticide shall be used as last resort if the attack reaches the ETL. For Green semi looper ETL will be 2 larvae per meter and 4 larvae per meter for Tobacco Caterpillar.</li> <li>Select effective pesticide with recommended dosage and correct spray technology.</li> </ul> | <ul style="list-style-type: none"> <li>Department of Agriculture will implement the Pest Management Plan.</li> <li>Monitoring – Semi-annually by PCMU/RIU/DIU</li> </ul> |
| Grape        | Flea beetle                               | <ul style="list-style-type: none"> <li>Shake vines to dislodge adult beetles, collect into trays containing kerosene water (1 kerosene: 9 water) and destroy them.</li> <li>Put bundles of dry shreds of banana on the pruned end of the vines in the evening. Beetles, which take shelter on these at night, can be shaken and collected in the morning and kill them.</li> <li>Use high quality, large, vigorous seed- the quicker a seedling can establish itself the more damage it can withstand from flea beetles.</li> <li>Increase seeding rates - increased plant populations mean less damage to each specific plant.</li> <li>Setting up of light trap @ 1/acre (6-10 pm).</li> <li>Neem based, emulsifiable water soluble formulations can be sprayed. Doses depend on azadirachtin concentrations in formulations viz., 50000 ppm formulation is sprayed at 1ml / l, while that with 10000 ppm and 3000 ppm can be sprayed at 2.5 ml and 5 ml per litre dose, respectively.</li> </ul>                                                                                                                                      | <ul style="list-style-type: none"> <li>Department of Agriculture will implement the Pest Management Plan.</li> <li>Monitoring – Semi-annually by PCMU/RIU/DIU</li> </ul> |
|              | Thrips                                    | <ul style="list-style-type: none"> <li>Install 4-20blue sticky coloured traps per acre to monitor thrips population.</li> <li>Deep ploughing in summer or raking of soil in vineyards helps to destroy its nymphal stages and minimizing the incidence.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>Department of Agriculture will implement the Pest Management Plan.</li> </ul>                                                     |

| Name of Crop | Name of Pest                    | IPM Measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Responsible organisation / PIU                                                                                                                                            |
|--------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |                                 | <ul style="list-style-type: none"> <li>Collect and destroy damaged leaves, fruits and flowers.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <ul style="list-style-type: none"> <li>Monitoring – Semi-annually by PCMU/RIU/DIU.</li> </ul>                                                                             |
|              | Mites                           | <ul style="list-style-type: none"> <li>Proper irrigation scheduling reduces the water stress and also increases the humidity thereby reducing the mite population.</li> <li>Several predatory insects and spiders feed on mites but the most efficient natural predators of mite pests are predatory mites</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <ul style="list-style-type: none"> <li>Department of Agriculture will implement the Pest Management Plan.</li> <li>Monitoring – Semi-annually by PCMU/RIU/DIU.</li> </ul> |
| Pomegranate  | Stem Borer / White fly / thrips | <ul style="list-style-type: none"> <li>Pheromone traps for <i>Spodoptera litura</i> @ 4-5/acre field must be installed.</li> <li>Set up yellow pan water/sticky traps 15 cm above the canopy for monitoring aphid, whitefly and blue sticky trap for thrips @ 4-5 traps/acre.</li> <li>Set up light traps @ 1 trap/acre 15 cm above the crop canopy for monitoring and mass trapping of nocturnal insects. Light traps with exit option for natural enemies of smaller size should be installed and operated from 6 pm to 10 pm.</li> <li>Add organic matter in the form of farm yard manure (FYM), vermicompost, crop residue which enhance below ground biodiversity of beneficial microbes and insects.</li> <li>Application of <i>Trichoderma harzianum/viride</i> and <i>Pseudomonas fluorescens</i> for treatment of seeds/seedlings/ planting materials in the nurseries and field.</li> <li>Raise the flowering plants / compatible cash crops along the orchard border by arranging shorter plants towards main crop and taller plants towards the border to attract natural enemies as well as to avoid immigrating pest population</li> <li>Pits of 1meter cube are dug in square system during summer season and kept open for controlling soil borne pests.</li> <li>Collect and destroy disease infected and insect infested plant parts. Collect and destroy eggs and early stage larvae.</li> </ul> | <ul style="list-style-type: none"> <li>Department of Agriculture will implement the Pest Management Plan.</li> <li>Monitoring – Semi-annually by PCMU/RIU/DIU.</li> </ul> |
|              | Post-Harvest measures           | <ul style="list-style-type: none"> <li>Fruits can be stored at 5°C with 90-95 percent relative humidity for 2 months.</li> <li>In case of storage beyond two months, temperature should be maintained at 10°C to avoid chilling injury.</li> <li>Pomegranates are very susceptible to water loss resulting in shrivelling of the skins. Storing fruit in plastic liners and waxing can reduce water loss, especially under conditions of lower relative humidity.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>Department of Agriculture will implement the Pest Management Plan.</li> <li>Monitoring – Semi-annually by PCMU/RIU/DIU.</li> </ul> |
| Citrus       | Aphids / Mites / Thrips         | <ul style="list-style-type: none"> <li>Monitor the field situation of the orchard at least once a week (soil, water, plants, pests, natural enemies, weather factors etc.)</li> <li>Do not plant or irrigate the field after ploughing, at least for 2-3 weeks, to allow desiccation of weed's bulbs and/or rhizomes of perennial weeds</li> <li>Pheromone traps for fruit sucking moth, leaf miner, citrus butterfly, stem borer @ 4-5/acre must be installed.</li> <li>Set up yellow water pan/sticky traps for monitoring aphid, black fly and blue water pan/sticky traps for thrips @ 4-5 traps/acre at the height of mid canopy.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>Department of Agriculture will implement the Pest Management Plan.</li> <li>Monitoring – Semi-annually by PCMU/RIU/DIU.</li> </ul> |

| Name of Crop | Name of Pest               | IPM Measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Responsible organisation / PIU                                                                                                                                                                                                                  |
|--------------|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Onion        | Thrips                     | <ul style="list-style-type: none"> <li>● Set up light traps @ 1 trap/acre at the height of mid canopy for monitoring and mass trapping insects.</li> <li>● Deep summer ploughing of fields to control nematodes and soil borne diseases.</li> <li>● Nitrogen is applied in the form of FYM and oil cakes each at 25 percent and the remaining 50 percent with chemical fertilizers, while, P<sub>2</sub>O<sub>5</sub> in the form of super phosphate and K<sub>2</sub>O in the form of muricate of potash.</li> <li>● The most important natural enemies of citrus mite are a predacious mite Euseius hibisci and the predators Agistemus sp. and Amblylseisus hibisci.</li> </ul> <ul style="list-style-type: none"> <li>● Before sowing, soil testing should be done to find out the soil fertility status. Nutrient should be provided as per soil test recommendations.</li> <li>● Add well rotten FYM @ 10 t/acre or vermicompost @ 4 t/acre. Incorporate FYM at the time of field preparation at 2 to 3 weeks before transplanting.</li> <li>● Use resistant/tolerant varieties</li> <li>● Practice field sanitation</li> <li>● Plant the new crop in upwind direction of already planted crop which help in escaping infestation from old planting to some extent in the initial stages.</li> <li>● Use of reflective plastic silver colour and aluminium painted black mulches repel the thrips (seed crop).</li> <li>● Use of sprinkler irrigation reduces thrips population considerably compared to drip and surface irrigation.</li> <li>● Plant two rows of maize or inner row of wheat and outer row of maize surrounding the onion plots as barrier crop.</li> <li>● Conserve the predators such as coccinellids, lacewings, spiders, wasps etc. for controlling thrips</li> </ul> | <ul style="list-style-type: none"> <li>● Department of Agriculture Department will implement the Pest Management Plan.</li> <li>●</li> <li>●</li> <li>●</li> <li>●</li> <li>●</li> <li>● Monitoring – Semi-annually by PCMU/RIU/DIU.</li> </ul> |
|              | Post-Harvest Measures      | <ul style="list-style-type: none"> <li>● Onions are ready to harvest when the tops start to turn yellow and die.</li> <li>● Bulbs intended for storage need to be cured (dry out) in a dark, dry place at 30-45 C and 60-75 percent RH for 1-4 days, until the necks turn brown.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <ul style="list-style-type: none"> <li>● Department of Agriculture Department will implement the Pest Management Plan.</li> <li>● Monitoring – Semi-annually by PCMU/RIU/DIU.</li> </ul>                                                        |
| Tomato       | Spodoptera and Helicoverpa | <ul style="list-style-type: none"> <li>● Pheromone traps for two insects viz., Helicoverpa armigera and Spodoptera litura @ 2/fixed field must be installed.</li> <li>● Use light traps and sticky trap as indicated in other Crop IPM.</li> <li>● Deep summer ploughing of fields to control nematodes and exposes dormant stages (pupa and larva) of Helicoverpa and Spodoptera and subsequently reduces their initial population build up.</li> <li>● Cover the beds with polythene sheet of 45-gauge (0.45 mm) thickness for three weeks before sowing for soil solarization which will help in reducing the soil-borne pests including weeds.</li> <li>● Ecological engineering of tomato with raising African marigold nursery 15 days prior to tomato</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <ul style="list-style-type: none"> <li>● Department of Agriculture Department will implement the Pest Management Plan.</li> <li>●</li> <li>●</li> <li>●</li> <li>●</li> <li>● Monitoring – Semi-annually by PCMU/RIU/DIU.</li> </ul>            |

| Name of Crop | Name of Pest                               | IPM Measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Responsible organisation / PIU                                                                                                                                                                                            |
|--------------|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|              |                                            | <p>nursery serves as a trap crop for oviposition females of Helicoverpa.</p> <ul style="list-style-type: none"> <li>● Apply neem cake @ 100 kg/acre.</li> <li>● Before sowing, soil testing should be done to find out the soil fertility status. Nutrients should be provided as per soil test recommendations. Generally, tomato needs 40: 24: 24 kg N: P: K/acre-for varieties and 60: 36: 36 kg N: P: K/acre-for hybrids.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                           |
| Turmeric     | Shoot borer                                | <ul style="list-style-type: none"> <li>● Use pheromone trap, blue pan water / sticky trap and light traps as described above</li> <li>● Resistant Varieties - Dindigam, Ca-68, Mannuthy local</li> <li>● Turmeric needs very heavy manuring during the four months period after planting. Crop requires 120 Kg N, 50 Kg P<sub>2</sub>O<sub>5</sub> and 80 Kg K<sub>2</sub>O per acre in organic and inorganic forms.</li> <li>● Use 10 t/ acre Farmyard manure or 4 t/ acre vermicompost at the time of field preparation.</li> <li>● Apply castor or neem cake @ 200 Kg/ acre</li> <li>● Mulching with green Lantana camara and Vitex negundo leaves @ 2 t/acre at 40 and 90 days after planting.</li> <li>● Release of Trichogramma chilonis @ 40,000/acre</li> <li>● Spray neem oil (0.5 percent) at fortnightly intervals.</li> </ul> | <ul style="list-style-type: none"> <li>● Department of Agriculture Department will implement the Pest Management Plan.</li> <li>●</li> <li>●</li> <li>●</li> <li>● Monitoring – Semi-annually by PCMU/RIU/DIU.</li> </ul> |
|              | Leaf spot                                  | <ul style="list-style-type: none"> <li>● Pluck and remove the infested leaf and uproot the infested plants and destroy them.</li> <li>● Use proper green mulching to reduce soil splashes.</li> <li>● Use of plant extracts such as garlic extracts is effective against foliar pathogens.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <ul style="list-style-type: none"> <li>● Department of Agriculture Department will implement the Pest Management Plan.</li> <li>●</li> <li>● Monitoring – Semi-annually by PCMU/RIU/DIU.</li> </ul>                       |
|              | Nematodes                                  | <ul style="list-style-type: none"> <li>● Uproot and destroy the infested plants.</li> <li>● Treat infested rhizomes with hot water (50 OC) for 10 minutes, using nematode free seed rhizomes and solarizing turmeric beds for 40 days.</li> <li>● Deep ploughing or solarized beds of infested fields during summer.</li> <li>● Spray of an extract of asafoetida, turmeric and water pathogens including nematodes.</li> <li>● An extract of asafoetida, turmeric and water is effective against several plant pathogens including nematodes.</li> <li>● Application of neem (Azaradirachta indica) seed cake 100 Kg/acre before planting.</li> <li>● Pochonia chlamydosporia, a nematode biocontrol agent can be incorporated in turmeric beds (20 g/bed at 106 cfu/g) at the time of sowing</li> </ul>                                 | <ul style="list-style-type: none"> <li>● Department of Agriculture Department will implement the Pest Management Plan.</li> <li>●</li> <li>●</li> <li>●</li> <li>● Monitoring – Semi-annually by PCMU/RIU/DIU.</li> </ul> |
| Chilli       | Viral Disease and Chilli leaf curl complex | <ul style="list-style-type: none"> <li>● Resistant variety Pusa Sadabahar, Arka Harita, Arka Meghana, Arka Sweta, Hisar Shakti, Hisar Vijay, Pant C-1</li> <li>● Apply neem cake @ 100 kg/acre at the time of transplanting for reducing nematodes and borer damage.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <ul style="list-style-type: none"> <li>● Department of Agriculture Department will implement the Pest Management Plan.</li> <li>●</li> <li>● Monitoring – Semi-annually by PCMU/RIU/DIU.</li> </ul>                       |
|              | Post-Harvest Storage                       | <ul style="list-style-type: none"> <li>● Peppers can be stored at 10 °C with 85-90 percent RH.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <ul style="list-style-type: none"> <li>● Department of Agriculture Department will implement the Pest Management Plan.</li> </ul>                                                                                         |

| Name of Crop         | Name of Pest      | IPM Measure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Responsible organisation / PIU                                                                                                                                                                                               |
|----------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      |                   | <ul style="list-style-type: none"> <li>Chillies can be damaged when stored below 10 °C.</li> <li>Sensitivity to cold varies with the cultivar; ripe fruit is less sensitive than green fruit. When stored above 13 °C, chillies are subject to accelerated ripening and bacterial soft rot infection.</li> <li>Where no cold storage facilities are available, fruit should be sorted, packed, and marketed within 24 hours of harvest</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <ul style="list-style-type: none"> <li></li> <li></li> <li>Monitoring – Semi-annually by PCMU/RIU/DIU.</li> </ul>                                                                                                            |
| Black and Green Gram | Hairy Caterpillar | <ul style="list-style-type: none"> <li>Apply well decomposed FYM @ 4 t/acre or vermicompost @ 2 t/acre treated with Trichoderma 2-3weeks before sowing</li> <li>Select healthy, certified, and weed seed free seeds.</li> <li>Seed treatment should be done with, Trichoderma spp. (8-10 g/Kg seed) and Rhizobium spp., AMF/PSB cultures each @ 30 g/Kg seed.</li> <li>Fertilizers should be applied on soil test basis, recommended to apply 10 to 12 Kg N, 20 to 30 Kg P<sub>2</sub>O<sub>5</sub> and 12 to 18 Kg, K<sub>2</sub>O per acre as basal dose.</li> <li>Sulphur and zinc deficiency areas apply sulphur @ 10-12 Kg/acre and zinc sulphate @ 10 Kg/acre in soil at the time of sowing.</li> <li>Dig the trenches of 1-inch depth between the fields &amp; dust the trenches to kill the larvae in pits.</li> <li>Irrigate once to avoid prolonged mid-season drought to prevent pre- harvest infestation</li> </ul> | <ul style="list-style-type: none"> <li>Department of Agriculture Department will implement the Pest Management Plan.</li> <li></li> <li></li> <li></li> <li></li> <li>Monitoring – Semi-annually by PCMU/RIU/DIU.</li> </ul> |

Source: National Centre for Integrated Pest Management, IPM Packages

### 14.3 Safety Parameter in Pesticide Usage

- Farmers shall be well trained on the mode of pesticide application, quantity to be applied and personnel protection equipment to be used while their application.
- Strictly comply with the manufacturer's direction on maximum recommended dosage as well as published report on using the reduced rate of pesticide application without loss of effect and apply minimum effective dose. Pesticide application equipment shall be calibrated and maintained in accordance with manufacturer's recommendation and only registered equipment shall be used.
- Pesticide used must have negligible adverse impact on human health and must be proven to be effective against the target species of pest. It should have minimal effect on nontarget species and the natural environment.
- Pesticide used must have been demonstrated to be safe for inhabitants, domestic animal and personnel using the same. Its usage shall be considered considering the need to prevent the development of resistance in pest.
- Application of pesticide shall be considered considering the field observations and weather condition.
- Avoid usage of pesticide that fall under WHO recommended classification of pesticide Hazard Class I a and I b. If no practical alternative is available then pesticide usage shall be done in accordance with National Laws by the certified personnel.

- Avoid the use of pesticides listed in Annexes A and B of the Stockholm Convention, except under the conditions noted in the convention and those subject to international bans or phaseouts.
- Avoid usage of pesticides and formulations that are banned to be used in India.
- Avoid usage of pesticides that have been historically linked to localized environmental problems and threat.
- Use of pesticides that are approved by WHO i.e., class IV.
- Pesticides used must be manufactured under licen, registered and approved by appropriate authority and in accordance with FAO's International Code of conduct on distribution and use of pesticides. Pesticides shall be labelled as per the FAO's latest guideline on Good Labelling Practices for pesticides.
- Accidental spillage of pesticide during usage, transfer, mixing and storage can result in contamination of soil, ground water and surface water. The following measures are recommended for safe handling and management of pesticides:
  - i. Pesticides shall be stored in original package and shall be stored in cool dry frost-free and well aerated location that can be locked and properly identified with signs and accessible to authorized person and stored out of reach of children and away from food items.
  - ii. Empty containers shall not be used for any other purpose and shall be handled as per hazardous waste handling rules and disposed-off to designated hazardous waste sites.
  - iii. Pesticides shall be mixed and transferred by farmers who are trained for the purpose in well-lit and ventilated area using containers designed and dedicated for this purpose.
  - iv. Pesticides shall be purchased to the extent that is needed and shall be stored such that it's used on first-in first-out basis to avoid wastage. Record shall be maintained on the usage of pesticides. Obsolete pesticides shall be destroyed in accordance to the guidelines by FAO and consistent with Country's commitment under the Stockholm, Rotterdam and Basel Convections.
  - v. Protective clothing's especially hand gloves and aprons shall be cleaned for reuse or shall be disposed-off in an environmentally sound manner.

#### 14.4 IPM Targets

The targets of the IPM will be determined after the quantification and assessment of the CBO and farming land coming under the CBO. The overall IPM targets for the SMART project are given below.

**Table 72: Overall IPM targets**

| S. No | Indicators                   | Targets                                                                                                                  | Timeline                                                                                                                                           |
|-------|------------------------------|--------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | No of IPM demonstration      | IPM Demonstration for all the CBOs (100 percent) for the SMART related agri-commodities                                  | IPM Demonstration for all the CBOs (100 percent) for SMART related agri-commodities to be completed within initial 02 years of project initiation. |
| 2     | Area to be brought under IPM | Minimum 50 percent of area under the SMART project to be brought under IPM                                               | Minimum 50 percent of area under the SMART project to be brought under IPM by the end of the project.                                              |
| 3     | Training on IPM requirement  | Training and capacity building of all the CBO (100 percent) representative on IPM for the SMART related agri-commodities | Training of all the CBOs (100 percent) under SMART related agri-commodities on IPM to be completed within initial 02 years of project initiation.  |



## 15 Labour Management Framework

Many of the sub-projects under SMART envisage undertaking civil works, for which labor force and associated goods and services will be required. Though the works may not be extensive, however, situations where the labor may not be fully supplied locally for several reasons, among them worker unavailability and lack of skills and capacity, cannot be ruled out. In such cases, the labor force (total or partial) may be from outside the sub-project area. In some cases, this influx may be compounded by an influx of other people (“followers”) who may follow the incoming workforce with the aim of selling goods and services, or in pursuit of jobs or business opportunities. The rapid migration to and settlement of workers and followers in the project area is **labor influx**. This labor influx if not managed adequately can lead to adverse social impacts and enhance vulnerabilities in the local communities, especially if the communities are rural, remote, or small. Some of the potential adverse impacts are summarized below:

- **Social conflict:** Conflicts may arise between the local community and the construction workers, which may be related to religious, cultural, or ethnic differences, or based on competition for local resources. Tensions may also arise between different groups within the labor force, and pre-existing conflicts in the local community may be exacerbated. Ethnic and regional conflicts may be aggravated if workers from one group are moving into the territory of the other.
- **Increased risk of illicit behavior and crime:** Influx of workers and service providers into communities may increase the rate of crimes and/or a perception of insecurity by the local community. Such illicit behavior or crimes can include theft, physical assaults, substance abuse, prostitution, and human trafficking. Local law enforcement may not be sufficiently equipped to deal with the temporary increase in local population.
- **Influx of additional population (“followers”):** In case of projects with large footprint and/or a longer timeframe, people can migrate to the project area in addition to the labor force, thereby exacerbating the problems of labor influx. These can be people who expect to get a job with the project, family members of workers, as well as traders, suppliers, and other service providers (including sex workers), particularly in areas where the local capacity to provide goods and services is limited.
- **Impacts on community dynamics:** Depending on the number of incoming workers and their engagement with the host community, the composition of the local community, and with it the community dynamics, may change significantly. Pre-existing social conflict may intensify as a result of such changes.
- **Increased burden on and competition for public service provision:** The presence of construction workers and service providers (and in some cases family members of either or both) can generate additional demand for the provision of public services, such as water, electricity, medical services, transport, education, and social services. This is particularly the case when the influx of workers is not accommodated by additional or separate supply systems.
- **Increased risk of communicable diseases and burden on local health services:** The influx of people may bring communicable diseases to the project area, including sexually transmitted diseases (STDs), or the incoming workers may be exposed to diseases to which they have low resistance. This can result in an additional burden on local health resources. Workers with health concerns relating to substance abuse, mental issues or STDs may not wish to visit the project’s medical facility and instead go anonymously to local medical providers, thereby placing further stress on local resources. Local health and rescue facilities

may also be overwhelmed and/or ill equipped to address the industrial accidents that can occur in a large construction site.

- **Gender-based violence:** Construction workers are predominantly younger males. Those who are away from home on the construction job are typically separated from their family and act outside their normal sphere of social control. This can lead to inappropriate and criminal behavior, such as sexual harassment of women and girls, exploitative sexual relations, and illicit sexual relations with minors<sup>22</sup> from the local community. A large influx of male labor may also lead to an increase in exploitative sexual relationships and human trafficking whereby women and girls are forced into sex work.
- **Child labor and school dropout.** Increased opportunities for the host community to sell goods and services to the incoming workers can lead to child labor to produce and deliver these goods and services, which in turn can lead to enhanced school dropout.
- **Local inflation of prices:** A significant increase in demand for goods and services due to labor influx may lead to local price hikes and/or crowding out of community consumers.
- **Increase in traffic and related accidents:** Delivery of supplies for construction workers and the transportation of workers can lead to an increase in traffic, rise in accidents, as well as additional burden on the transportation infrastructure.

These adverse impacts may be amplified due to low capacity of the contractor to manage and absorb the incoming labor force, specifically when civil works are carried out in, or near, vulnerable communities and in other high-risk situations. While many of these potential impacts will be identified during initial screening for the preparation of sub-projects, they may only become fully known once the decision on sourcing the required labor force is made. Thus, it is important to develop *Site-Specific Measures*, and subsequent *Labor and Working Conditions Management Plan (LWCMP)* before the contractor starts work and update them as necessary to reflect project developments. *Table 73 indicates screening questions that are to be assessed at the time of initial screening of sub-projects to assess labor influx. The district / regional teams will facilitate this.*

Though, temporary labor influx may have adverse impacts on the host community, it is important to recognize that appropriately managed labor influx can provide potential benefits for the community. These benefits are typically related to economic opportunities through employment and/or training by the project, or through selling goods and services. Other benefits include the provision of local infrastructure (e.g., access roads, power or water connection) which may be developed for the project and which serves the community beyond the project duration.

### 15.1 Initial Screening: Will the project require labor influx?

During initial screening, the project will get details on the key screening questions set out in Table below. If the answer to any of the screening questions is yes, it is suggested that the project will conduct detailed screening and assessment to understand the potential significance and likelihood of potential impacts. Depending on the stage of project preparation and the timing of selection of the contractor, answers to some of the screening questions may not be available.

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<sup>22</sup> The Bank defines a minor as an individual below the age of 18 years.

**Table 73: Initial Screening Questions**

| Key Screening questions                                                                                                                                                                                                                                | Aspects to Consider                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Will the project potentially involve an influx of workers to the project location, and will the influx be considered significant for the local community?</b>                                                                                    | <ul style="list-style-type: none"> <li>› How many workers will be needed for the sub-project/ activity, with what skill set, and for what period?</li> <li>› Can the project hire workers from the local workforce?</li> <li>› What is the size and skill level of the existing local workforce?</li> <li>› If the skill level of the local workforce does not match the needs of the project, can they be trained within a reasonable timeframe to meet project requirements?</li> <li>› How will the workers be accommodated? Will they commute or reside on site? If so, what size of camp will be required?</li> <li>› Is the project likely to hire more male workers from outside?</li> </ul>                                  |
| <b>2. Is the sub-project / activity located in a rural or remote area?</b>                                                                                                                                                                             | <ul style="list-style-type: none"> <li>› What is the size of local population in the sub-project area?</li> <li>› What proportion of the local population live below poverty line?</li> <li>› Is the sub-project located / being carried out in an area that is not usually frequented by outsiders?</li> <li>› What is the frequency and extent of contact between the local community and outsiders?</li> <li>› Are there socially / culturally sensitive community / conditions that need to be considered?</li> </ul>                                                                                                                                                                                                            |
| <b>3. Based on the socio-economic, cultural, religious and demographic qualities of the local community and the incoming workers, is there a possibility that their presence or interaction with the local community could create adverse impacts?</b> | <ul style="list-style-type: none"> <li>› Is it likely that the incoming workers and the local community come from a shared socio-economic, cultural, religious or demographic background?</li> <li>› Are local communities poorer than incoming workers? Will incoming workers have enough disposable cash to purchase alcohol, drugs, solicit commercial sex?</li> <li>› What is the level of existing resources, and will the incoming workers use or create competition for these resources?</li> <li>› What is the expected duration of the incoming workers' presence in the community?</li> <li>› Given the characteristics of the local community, are there any specific adverse impacts that may be anticipated?</li> </ul> |

## 15.2 Labor Influx and Working Conditions Management Plan (LIWCMP)

SMART will undertake civil works for the construction of facilities such as warehouses, slaughter houses, processing units, cold storage and so on, which may involve different sizes of contracts and workers. Since quality is key to the project, assuring skilled labor to deliver state-of-the-art facilities is critical. SMART through its teams at the district and regional levels, will ensure that the contractor/sub-contractor conforms to the provisions of the LIWCMP for the mitigation measures designed to avoid or reduce undesired labor influx impacts during the construction activities. Based on this, the Contractor(s) / sub-contractor(s) must develop the mitigation measures and provide appropriate roles and responsibilities to implement them. The contractor must:

- Ensure implementation relevant Labor laws relating to their welfare (as per the National Legislation and ILO core convention on labor Standards applicable to India), wages, basic amenities at work place, overtime, insurance etc.
- Avoid or reduce instances of negative impacts on the community and maintain constructive relationships between local communities and workers' camps;
- Establish standards on worker welfare and living conditions at the camps that provide a healthy, safe, and comfortable environment.

This Labor Influx and Working Conditions Management Plan should be implemented in conjunction with the project's social management plans (SMPs) of the sub-projects.

### 15.2.1 Management and Monitoring

The summary of the potential impacts related to camp activities, mitigation and management measures to avoid or reduce these impacts, and the monitoring required to determine the performance of these measures are discussed below. The Contractor shall develop a Contractor Plan to take mitigation measures described below:

#### 15.2.1.1 Maintaining Community Relations

1. Unauthorized movements of construction workers (during and after working hours) could result in trespassing and create amongst residents a sense of their privacy being invaded. This may result in increasing incidents of crime and or violence and threats to the safety of community members. The disparity of income levels and potential availability of illegal substances, illicit or culturally inappropriate lifestyle choices can also cause increased tension between local communities and the workers at camps. Contractor shall enforce a 'closed' camp policy. Workers will be strictly prohibited from leaving camps for nonwork related activities and interacting with the local community unless agreed by Company.
2. Contractor/sub-contractor, as appropriate, shall provide adequate recreation facilities for workers to reduce incentive for leaving camps during leisure time. Contractor/sub-contractor shall limit workers' interaction with the community when outside the camp, for example, by organizing transport directly to and from the worksite.
3. If community members or local businesses express grievances in relation to camp related activities/operations, the contractor shall immediately respond to the grievance requiring camp related activities/operations to be amended to address community grievances.

#### 15.2.1.2 Discipline in the Camp

4. The workers shall abide by camp rules which includes a disciplinary process. Contractor/sub-contractor shall ensure adherence to the code of conduct by the workers in the camp.
5. The Project shall, be cognizant of the environment in which it works and shall, where practicable, respect local cultural events such as religious events, funerals and the like.
6. The contractor/sub-contractor shall provide briefing to all migrated workers on camp rules, behavior between fellow workers and the community; procedures for dealing with camp related complaints, and a community relations orientation. The objective of this orientation will be to increase awareness about the local area and cultural sensitivities.
7. Potential interaction between workers, persons engaged in illicit activities and the community increases the risk of spreading communicable diseases, particularly in more remote communities. The Contractor shall comply with the minimum health requirements for project execution within camps and to outside communities.
8. Provide guidance / training on the detrimental effects of the abuse of alcohol and drugs and other potentially harmful substances and the risk and concerns relating to HIV/AIDS and of other health risk-related activities to workers.
9. Ensure that the workers have access to adequate preventive measures such as contraception (condoms in particular) and mosquito nets, if needed.

#### 15.2.1.3 Community Resources

1. Any infrastructure, services or resources used by camps that result in reductions or shortage for the local community will have a negative impact. Contractor/sub-contractor shall utilize these resources for camp use in a manner that minimizes impacts on local supply and use.
2. Increased demand for food and other provisions may deplete natural resources e.g., firewood, timber, game, fisheries, etc. potentially causing shortages of supply in the local community,

and/or increasing the price of goods, affecting affordability for local communities. The contractor shall as far as possible not purchase products in the local community unless through formal contracts.

#### 15.2.1.4 Camp Location

1. Setting up of camps may result in displacement of residents, loss of productive lands and the resources upon these lands. Camps may also restrict or impede access to areas for the local community. Potential camp locations will be selected in consultation with the affected communities.
2. Construction camps may result in a noticeable increase in traffic, noise, air emissions and light intrusion which could negatively affect the lifestyle of nearby communities and pose a potential safety issue. The Project shall refer to those Environmental Management Plan's (EMP) that include mitigation/avoidance measures that relate to the local community,

#### 15.2.1.5 In-migration

3. There is a strong likelihood of in-migration into areas around the construction camps. The Contractor shall enforce a 'closed' camp policy. Existing communities may also relocate to be closer to the camps. In-migration can result in disputes and sometimes violence between the new settlers and the resident community. Migrants moving into existing settlements may increase demand and inflate prices for housing, goods and services and increased pressure on infrastructure, services, and resources.
4. To address the above, each contractor / sub-contractor will develop a worker registration system that will enable SMART to keep track of all workers on each site and to identify the organization (CBO/ PIU) for whom they directly work.

#### 15.2.1.6 Worker Welfare, Living Conditions and Non-discrimination

1. The contractor / sub-contractor must ensure that all workers on site are provided with information on their terms and conditions, including hours, wages, breaks and holidays, discipline, and termination procedures in a language they understand, and that all workers on site understand how to access an easily-accessible, confidential process for making complaints about their employment. In addition, all contractor(s)/sub-contractor(s) must regularly conduct awareness sessions on GBV, especially with female co-workers.
  - a. This will require establishing a coherent and integrated grievance mechanism for all workers engaged in the SMART project.
  - b. In addition, there should be adequate provision/mechanisms for reporting cases of sexual harassment and abuse, with a time frame within these are addressed and resolved. This can be tied the internal complaints committee set up within the project.
2. Each contractor/sub-contractor should develop a register for all their workers. This register should contain data such as: name, age, sex, hours worked, wages, payments (including overtime payments) made and any deductions made from their wages. The register should be in line with national requirements on registration of workers.
3. Each contractor/sub-contractor should specify the minimum age for employment or engagement in connection with the project, which will be the age of 14.
  - a. A child over the minimum age and under the age of 18 will not be employed or engaged in connection with the project in a manner that is likely to be hazardous<sup>23</sup> or interfere with the

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<sup>23</sup> Work considered hazardous for children is work that, by its nature or the circumstances in which it is carried out, is likely to jeopardize the health, safety, or morals of children. Examples of hazardous work activities prohibited for children include work: (a) with exposure to physical, psychological or sexual abuse; (b) underground, underwater, working at heights or in confined spaces; (c) with dangerous machinery, equipment or tools, or involving handling or transport of heavy loads; (d) in unhealthy environments exposing children to

child's education or be harmful to the child's health or physical, mental, spiritual, moral or social development.

4. Construction workers living in camps may encounter stresses and discomforts that negatively impact their health and welfare. These may be caused by poor living conditions (accommodation, ablution and sanitary, health, recreation catering and laundry). Contractor shall comply with minimum standards for camp buildings, facilities, and services. This will include but are not limited to: i) provision of minimum amounts of space required for each worker; ii) provision of sanitary (separate toilets for men and women); iii) laundry and cooking facilities and potable water; iv) creche facility for small children of working women; v) provision of first aid and medical facilities; vi) adequate cleanliness and hygiene in the accommodation. There will be no discrimination in facilities based on worker's race, gender or nationality.
5. Emergency plans on health and fire safety are prepared for minimizing the accidental and intended critical situations, including a plan for fire safety, including training of workers, periodic testing and monitoring of fire safety equipment and periodic drills. Depending on the local context, additional emergency plans are prepared as needed to handle specific occurrences (earthquakes, floods, cyclones, etc.)
6. Cultural issues (nationality, religion, discrimination, and harassment, etc.): Contractor may provide prayer rooms and other facilities, as necessary and to the extent practicable, to satisfy the religious needs and customs of its workforce.
7. Contractor's personnel shall not engage in any discrimination or harassing behavior. Contractor shall establish an Equal Opportunity Policy to promote non-discrimination in accordance with labor legislations.
8. Contractor shall implement a worker grievance procedure to address grievances between the workers.
9. Camp rules in relation to alcohol consumption and drug prohibition will be complied with. Contractor shall provide recreational facilities where practicable. In addition, Contractor will provide counselling for all workers, with no discrimination by race, sex or religion.
10. Each contractor/sub-contractor will maintain a register on accidental incidents and actions taken to avoid similar situations.

#### 15.2.1.7 Security of the Camp

1. The security measures will control camps to avoid intrusions from outside community. Contractor shall include security measures to be provided at the camps which may include fencing, locks, alarms, pass card systems, badge and pass system, access points, safe transport of personnel as appropriate.
2. Decommissioning of camps has several potential impacts. Local employment and provision of local goods and services at camps will no longer be required; Locals employed and previously accommodated in camps will no longer have access to services and benefits available at camps (e.g. health services, recreation facilities); and Infrastructure which provides benefits to communities may no longer be maintained (e.g. roads) and may be decommissioned and removed or reinstated (e.g. access tracks). Contractor is to follow a proper retrenchment procedure and where community requests, some infrastructure and services may be retained at the discretion of Company. Where practicable, Contractor will return camp areas to former landforms.

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hazardous substances, agents, or processes, or to temperatures, noise or vibration damaging to health; or (e) under difficult conditions such as work for long hours, during the night or in confinement on the premises of the employer.

### 15.2.1.8 Roles and Responsibilities

#### Role of Contractor / sub-contractor

1. The Contractor shall ensure sufficient resources are allocated on a regular basis to meet the requirements of this Plan. The Contractor Plan shall describe the roles and responsibilities of the personnel and ensure that they are communicated properly to all concerned.
2. Training and Awareness Generation: Contractor shall ensure that all personnel responsible for the execution of the tasks and requirements contained within this Plan are competent based on their education, training and experience. The Contractor Plan shall describe the training and awareness requirements necessary for its effective implementation. The contractor shall also consult with the communities to help build economic and social capacity that benefits communities.

#### Role of SMART

With regards to this LWCMP, SMART will be responsible for the key management activities including:

- Development of bidding conditions regarding workers' accommodation conditions;
- Professional training of its representatives on site;
- Monitoring, evaluations, and audit;
- Management cooperation in case of incidents (including registration and communication of events);
- Monitoring of corrective operations.

Specifically, within the SMART the following roles and responsibilities will apply:

**Table 74: Roles and responsibilities**

| Role                                    | Responsibilities                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project Director                        | Approves the Labor and Working Conditions Management Plan                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Site coordinator / Manager /PIU/RIU/DIU | <ul style="list-style-type: none"> <li>● Assures implementation of LWCMP, including for Contractor implementation</li> <li>● Develops, monitors, and revises LWCMP, as and when required, in consultation with the PCMU and Bank</li> <li>● Assures availability of this Plan to PIU/CBO members and contractor / sub-contractor</li> <li>● Periodical inspections / audits of contractors /sub-contractor's performance and prepares regular report that includes details about workers lives conditions and any incidents (especially regarding incidents of GBV/SEA)</li> <li>● Reports all risks, lack of conformities and incidents</li> <li>● Periodically verifications of accommodation conditions</li> <li>● Collect data from settlements</li> <li>● Collaborate with local authorities</li> </ul> |

## A. Detailed Scope of Work

The scope of work as defined in the Terms of Reference is as delineated below:

### A.1 Environmental and Social Assessment (ESA)

The consultant(s) will conduct an environment and social assessment to identify key environmental and social issues, challenges and risks about the proposed project activities and locations. This assessment will be undertaken in nine Agro-Climatic Zones of Maharashtra under the SMART Project. The ESA shall be prepared after conducting field visits/Field survey to a sample of proposed sites and a thorough review of literature and collection of secondary data. Moreover, during field visits, stakeholders and beneficiaries will be consulted in every location to understand their needs and concerns and how the project can address these better. The ESA will include:

#### A.1.1 Environmental and Social Baseline(s)

Consultants will prepare baseline of the key environmental and social parameters, including but not limited to usage of agrochemicals, practice of organic / low input farming, irrigation practices, food safety, health, hygiene, use of solar energy in agro-processing industries, presence of indigenous people (STs), socio-economic status of direct project beneficiaries at the community level, land holding pattern, etc. Consultants should propose additional parameters, as may be required. While secondary data will be collected for baselines, wherever necessary; limited primary data collection may be undertaken.

Keeping in view the scope of the given study and its related timeline, viz., 03 Months; representative 100 number of samples of different abovementioned indicators should be selected from the 09 Agro-Climatic Zones of Maharashtra.

The agency will do 50 samples in 05 agro-climatic zones (Eastern Vidarbha Zone, Central Vidarbha Zone, Central Maharashtra Plateau Zone, North Konkan Coastal Zone and South Konkan Coastal Zone) while project staff will collect data for 50 samples in remaining 04 agro-climatic zones (Western Ghat Zone, Sub-Montane Zone, Western Maharashtra Plain Zone and Scarcity Zone) and from the proposals received for productive partnerships, market access plans and collateral management agencies. The Agency will do analysis for all the 100 samples.

The sites selected for developing baselines should represent all nine agro-climatic zones of Maharashtra and cover all stakeholders such as Community Based Organizations (FPCs, CLFs, PACS, CMRCs)<sup>24</sup>, SC and ST population with adequate gender representation (women).

#### A.1.2 Social Assessment:

Social Assessment of rural households should be done to assess the patterns of asset ownership, livelihoods, access of excluded groups to goods and services, etc. to identify and suggest interventions to increase ownership of the SMART project interventions. Social development outcomes of the assessment exercise should focus on poverty reduction, equity and inclusion, strengthening of social capital and social cohesion, and promotion of accountable and transparent

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<sup>24</sup> [FPC- Farmer Producer Company, CLF- Cluster Level Federation, PACS- Primary Agricultural Credit Society, CMRCs- Community-managed Resource Centers](#)

governance, as well as suggest measures to mitigate adverse impacts anticipated from project activities.

#### A.1.2.1 Review of the Legal and Policy Environment:

With respect to the proposed project interventions, the consultants will review the existing legal and policy environment of Government of India<sup>25</sup> and Govt. of Maharashtra<sup>26</sup> in relation to their applicability to the proposed project interventions, investments and compliance. The Consultants will also review the applicability of the World Bank's Environment and Social Safeguards Policies (OP 4.01 - Environmental Assessment, OP4.03 - Performance Standards for Private Sector Activities, OP4.04 – Natural Habitats, OP 4.09- Pest Management, OP 4.10 - Indigenous Peoples and OP 4.12 - Involuntary Resettlement, etc.). Identify which of the environmental and social laws are applicable to the project along with the World Bank's safeguards policies<sup>27</sup> triggered by the project and provide adequate justification as well as ensure that mitigation measures and actions are included in the ESMF to meet the requirements of the triggered policies.

#### A.1.2.2 Analysis of GHG Footprint and Climate Risks of Select Value Chains

Based on the agreed sample value chains, the consultants will estimate the current GHG emissions and climate footprint of the selected value chains and suggest measures to lower it along the same. The resultant carbon estimate findings would be crucial and act as one of the key bases to estimate State-wide Overall GHG Footprint and Climate Risks of the SMART project.

#### A.1.2.3 Stakeholder Consultations:

The consultants will carry out detailed and in-depth consultations with all the stakeholder (direct community level beneficiaries, men and women farmers, CBOs, agri-business enterprises of varying sizes, consumers, State Government Departments, etc.) and prepare stakeholder feedback report with names of participants, photographs and short videos. These consultations will cover key challenges and issues faced by these entities and possible solutions and recommendations suggested by the stakeholders.

#### A.1.2.4 Assess Food Safety Standards:

Based on a Consultative dialogue with the food industries and consumers, consultants will assess key issues and gaps in existing capacities for improving the adoption of food safety standards in the agribusiness sector. This should include a comparison with the India Gap Standards and Maximum Residue Level (MRL). The Consultant/s will identify and list the commodities for which food safety standards are available and those commodities that are traded but do not currently have any standards<sup>28</sup>.

#### A.1.2.5 Identify Environmental Impacts and Risks

Based on historical trends and field-based observations, stakeholder consultations and overall findings of the ESA, consultants will identify potential and likely environmental adverse risks and impacts of the proposed project activities (for devising mitigation measures). Both short-term and long-term as well as direct and indirect impacts and risks needs to be identified.

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<sup>25</sup> <http://www.envfor.nic.in/legis/legis.html>

<sup>26</sup> <http://www.landsofmaharashtra.com/landrelatedlaws.html>

<sup>27</sup> <https://www.worldbank.org/en/projects-operations/environmental-and-social-policies>

<sup>28</sup> [https://www.ifc.org/wps/wcm/connect/c7bfaf0048855482b314f36a6515bb18/Final\\_percent2B-percent2BFood\\_percent2Band\\_percent2BBeverage\\_percent2BProcessing.pdf?MOD=AJPERES](https://www.ifc.org/wps/wcm/connect/c7bfaf0048855482b314f36a6515bb18/Final_percent2B-percent2BFood_percent2Band_percent2BBeverage_percent2BProcessing.pdf?MOD=AJPERES)

#### A.1.2.6 Assess capacity of proposed PMU to respond to identified environmental and social risks and impacts

The consultants will assess the adequacy of the proposed PMU and other institutional arrangements for implementation of the SMART project in addressing identified environmental and social risks and impacts and suggest measures to strengthen such capacity.

#### A.1.3 Environmental and Social Management Framework (ESMF)

Based on the findings of the ESA, the consultant/s will develop an ESMF that lists all identified potential impacts and risks and proposed mitigation actions, along with a monitoring framework for each risk and action. It will include, among others:

- **Impacts and Mitigation Action:** Based on the identified impacts and risks, develop implementable and practical mitigation actions to address/reduce/reverse adverse environmental and social impacts against each of the identified (in the ESA) adverse environmental impacts and risks. Mitigation measures could be at the level of policy, mainstreamed into project design, capacity development and/or implemented as stand-alone;
- **Measures for Enhancing Positive Environmental and Social Outcomes:** Suggest appropriate measures to enhance positive environmental and social impacts, such as, arising from the use of improved production processes that reduces use of water, electricity and other natural resources, improve ventilation of the production unit to ensure that employees work in safe ambient temperatures, use of easily degradable packaging materials, on the environment side; and ways to include more female beneficiaries at the higher end of the value chain and to involve members from marginalized sections on the social side;
- **Negative List:** A negative list of activities having significant, long-term and irreversible adverse impacts will be prepared that will not be supported through project investments;
- **Specific Strategies and Plans:** The consultants will develop the following project specific strategies and plans – Gender Strategy, Planning Framework, Stakeholder Engagement Plan, Pest Management Plan and Food Safety Strategy. Based on the ESA, additional strategies may need to be developed. Additional strategies, such as, health, hygiene and safety management plan, periodic and regular cleaning protocol for production and aggregation units, system for periodic third-party inspection and certification of participating units, self-declaration protocols etc., may be prepared, as required based on the findings of the ESA;
- **Implementation Arrangements for ESMF:** Suggest, in proportion to the identified risks and impacts, institutional and implementation mechanisms, including the requirement of qualified staff(s) with clear roles and responsibilities for implementing the proposed mitigation actions at all stages of the project, including measures for integration in designing of sub-projects;
- **Monitoring Plan:** Provide a list of measurable indicators for monitoring the performance of agreed mitigation actions during project implementation, including the methods of measuring, frequency and responsibility of reporting;
- **Capacity Enhancement:** Suggest measures, including trainings, for strengthening the Project Management capacity to implement, monitor, document and report on the various provisions of the ESMF;
- **Clauses for Inclusion in Bid Documents:** The ESMF should be able to provide a list of potential clauses related to food processing units that shall be integrated/incorporated into the bidding/contract documents and/or loan appraisal documents of financial institutions participating in this project, as may be required based on the size and nature of civil contracts;
- **National and International Good Practices:** Prepare a list of international good practices and sustainability initiatives developed, adopted and practiced by private sector related to

contract farming, Farmer Producer Organizations/Companies, upgradation and upkeep of the food processing units; and

- **Specific Studies:** Based on the findings of the ESA and the coverage of ESMF, suggest a list of specific studies that shall be taken up under the project for increasing the understanding of the issues and/or for developing strategies to address challenging issues related to the project's policy, regulatory and operational aspects; and
- **Budget for ESMF:** Based on the suggested mitigation actions, staff and human resource requirements, monitoring and capacity building needs, the consultants will propose a financial budget for implementing the ESMF.

## B. Checklists for Stakeholder Consultations

### B.1 Crop-wise Checklists template for FPCs covered (for total of 35 crops)

#### FPCs Checklist template

| Name of the Interviewer: |                                                                                                                                                                             |                                                                                |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| Name of the interviewee: |                                                                                                                                                                             |                                                                                |
| Date of interview:       |                                                                                                                                                                             |                                                                                |
| Place of interview:      |                                                                                                                                                                             |                                                                                |
| S. No                    | Questions                                                                                                                                                                   | Response                                                                       |
| 1                        | Name of the FPC                                                                                                                                                             |                                                                                |
| 2                        | Address of the FPC                                                                                                                                                          |                                                                                |
| 3                        | No of Shareholders / members of FPC                                                                                                                                         |                                                                                |
| 4                        | Name of the Promoter(s)/Partner(s)                                                                                                                                          |                                                                                |
| 5                        | Address of the FPC                                                                                                                                                          |                                                                                |
| 6                        | Contact No of FPC                                                                                                                                                           | Telephone No.:<br>Mobile No.:                                                  |
| 7                        | e-mail Id of FPC                                                                                                                                                            |                                                                                |
| 8                        | Date of establishment of FPC                                                                                                                                                |                                                                                |
| 9                        | What is the storage facility of the FPC                                                                                                                                     |                                                                                |
| 10                       | What is the existing processing infrastructure available in the FPC?                                                                                                        |                                                                                |
| 11                       | What is the processing capacity of each infrastructure?                                                                                                                     |                                                                                |
| 12                       | What are the user charge rates?                                                                                                                                             |                                                                                |
| 13                       | What is the capacity utilization of the processing equipment - average how many hours in day / month / year                                                                 |                                                                                |
| 14                       | What is the major source of livelihood of the villagers? (farming, government jobs, business etc)                                                                           |                                                                                |
| 15                       | What is the area under cultivation for the crop?                                                                                                                            |                                                                                |
| 16                       | What is the Average landholding size of the farmer cultivating the crop?                                                                                                    |                                                                                |
| 17                       | What is the Average annual production of the crop per hectare?                                                                                                              |                                                                                |
| 18                       | Total no. of farmers belonging to the FPC:                                                                                                                                  |                                                                                |
| 19                       | Out of the total no. of farmers, how many are having farming equipment such as tractors / threshers?                                                                        |                                                                                |
| 20                       | What is the type of soil used for cultivation of the crop?                                                                                                                  |                                                                                |
| 21                       | What is the water quality required for cultivation of the crop?                                                                                                             |                                                                                |
| 22                       | What is the source of water for cultivation?                                                                                                                                |                                                                                |
| 23                       | How much Area is covered under irrigation?                                                                                                                                  |                                                                                |
| 24                       | What is the irrigation type e.g. canal irrigation / Drip irrigation?                                                                                                        | Drip Irrigation percent:<br>Canal Irrigation percent:<br>Other method percent: |
| 25                       | How much is the water requirement per hectare for cultivation of the crop. Please collect information is different variety required different quantity of water per hectare |                                                                                |
| 26                       | Are any water conservation measures adopted by the farmers during cultivation of the crop?                                                                                  |                                                                                |
| 27                       | What are the sources for purchase of seed?                                                                                                                                  |                                                                                |
| 28                       | What are the variety of the crop is cultivated?                                                                                                                             |                                                                                |
| 29                       | Any climate resistant variety available / promoted?                                                                                                                         |                                                                                |

### FPCs Checklist template

|    |                                                                                            |                                              |
|----|--------------------------------------------------------------------------------------------|----------------------------------------------|
| 30 | What is the rate at which seeds / nursery are available?                                   |                                              |
| 31 | What are the fertilizers used for cultivation of the crop?                                 |                                              |
| 32 | How much is the quantity of the fertilizer used per hectare?                               |                                              |
| 33 | What is the rate at which fertilizer is available to farmers?                              |                                              |
| 34 | Are farmers aware of the quantity and quality of fertilizers to be used?                   |                                              |
| 35 | How much quantity of fertilizer is used per hectare?                                       |                                              |
| 36 | What are the problems faced regarding fertilizers?                                         |                                              |
| 37 | What are the pests that attack cultivation of the crop?                                    |                                              |
| 38 | Are Farmers aware of biological trap control for pests?                                    |                                              |
| 39 | What are the pesticides used for controlling pest in cultivation of the crop?              |                                              |
| 40 | What is the quantity of pesticide used per hectare?                                        |                                              |
| 41 | What is the rate at which pesticide is available to farmers?                               |                                              |
| 42 | Are farmers aware of the health impacts of pesticides?                                     |                                              |
| 43 | Do farmers get training and awareness regarding use of pesticides?                         |                                              |
| 44 | How is the left-over pesticides and its empty containers handled?                          |                                              |
| 45 | What are the diseases commonly seen in the crop in the region?                             |                                              |
| 46 | History of crop cultivation loss due to disease if yes provide details.                    |                                              |
| 47 | Are there Agrochemicals such as fungicides / insecticides used in cultivation of the crop? |                                              |
| 48 | What are the agrochemicals used for cultivation of the crop?                               |                                              |
| 49 | How much is the quantity of agrochemicals used by the farmers?                             |                                              |
| 50 | What is the rate at which the agrochemicals are available to the farmer?                   |                                              |
| 51 | Are there proper demonstration or training for use of agrochemicals in the farm?           |                                              |
| 52 | How is the leftover Agri-chemicals / pesticides after use handled / utilized or disposed?  |                                              |
| 53 | How are the containers of Agri-chemicals / pesticides disposed?                            |                                              |
| 54 | Is solar energy used in the crop production by farmers? If yes how many farmers have?      |                                              |
| 55 | Is solar energy used in the FPC? If yes for what purpose and its capacity?                 |                                              |
| 56 | Are there any organic farming adopted by the farmers for cultivation of this crop?         |                                              |
| 57 | Is there any farm residue / Agri-waste left in the field after harvest?                    |                                              |
| 58 | How is the farm residue / Agri-waste handled by the farmers?                               |                                              |
| 59 | How many farmers adopt organic farming technique?                                          |                                              |
| 60 | Are there any inter-cropping practice followed by farmers?                                 |                                              |
| 61 | What are the short duration crops grown?                                                   |                                              |
| 62 | What is the quality standard specification of the crop that you prefer?                    |                                              |
| 63 | Whether the Quality of produce fulfil the market demand / Industry demand?                 |                                              |
| 64 | Details of the existing Market linkages                                                    | Name of the buyer:Quantity of crop supplied: |
| 65 | How much is the time required till harvest after planting?                                 |                                              |
| 66 | What is the prevailing price of the crop, given to farmers?                                |                                              |
| 67 | What is the prevailing price of the intercrop?                                             |                                              |
| 68 | What is the good agricultural practice for the crop                                        |                                              |
| 69 | No of beneficiaries of Kisan Credit Card (KCC)?                                            |                                              |
| 70 | How many use Crop insurance in the cluster?                                                |                                              |
| 71 | How many use soil health cards?                                                            |                                              |

### FPCs Checklist template

|    |                                                                                                                             |                                            |
|----|-----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| 72 | What are the factors which influence the quality of the crop?                                                               |                                            |
| 73 | What is the farm advisory services given to farmers? Such as SMS service for meteorological data or awareness creation etc. |                                            |
| 74 | Are Training provided to farmers?                                                                                           |                                            |
| 75 | Are Female farmers engaged in cultivation of this crop?                                                                     |                                            |
| 76 | How many SC farmers are engaged in production of this crop?                                                                 |                                            |
| 77 | How many ST farmers are engaged in production of this crop?                                                                 |                                            |
| 78 | How is the work divided among male and female farmers during cultivation?                                                   |                                            |
| 79 | What are the challenges faced by the FPCs?                                                                                  | Production:<br>Post-Harvest:<br>Marketing: |
| 80 | What is the post harvesting facilities required by the FPC including primary processing, Storage and Logistics?             |                                            |
| 81 | What measures shall be adopted to enhance the performance of FPCs                                                           |                                            |
| 82 | Is there any Grievance Redress Mechanism, available?                                                                        |                                            |
| 83 | In case of any grievance where do you file complaint?                                                                       |                                            |
| 84 | How much time does it take to resolve the issue?                                                                            |                                            |
| 85 | Where complaint can be filed by hard copy/Mobile/online?                                                                    |                                            |
| 86 | Are there any Natural disasters such as drought / flood etc that affect agriculture is the last 10 years?                   |                                            |

### Other common questions

|                            | Quantity                           | Disposal method        | Impact perceived        | Mitigation measures |
|----------------------------|------------------------------------|------------------------|-------------------------|---------------------|
| <b>Residual Material</b>   |                                    |                        |                         |                     |
|                            | Residual Agricultural Farm Produce |                        |                         |                     |
|                            | Pesticide                          |                        |                         |                     |
|                            | List the Fertiliser                |                        |                         |                     |
|                            | Problem faced                      |                        |                         |                     |
| <b>Pesticide</b>           |                                    |                        |                         |                     |
|                            | List the Pesticide                 |                        |                         |                     |
|                            | Health Impact                      |                        |                         |                     |
|                            | Awareness and training             |                        |                         |                     |
|                            | Efficiency                         |                        |                         |                     |
|                            | Problem faced                      |                        |                         |                     |
| <b>Fertiliser</b>          |                                    |                        |                         |                     |
|                            | List the fertilisers               |                        |                         |                     |
|                            | awareness of quantity and Quality  |                        |                         |                     |
|                            | efficiency                         |                        |                         |                     |
|                            | Problem faced                      |                        |                         |                     |
| <b>Water</b>               |                                    |                        |                         |                     |
|                            | Source of water                    |                        |                         |                     |
| <b>Manure</b>              |                                    |                        |                         |                     |
|                            | Availability of manure             |                        |                         |                     |
|                            | Quantity of manure                 |                        |                         |                     |
| <b>Social and Gender</b>   |                                    |                        |                         |                     |
|                            |                                    | Qualitative assessment | Quantitative Assessment |                     |
| <b>Women participation</b> |                                    |                        |                         |                     |
|                            | List the Activity                  |                        |                         |                     |

|                                                                      | Quantity | Disposal method | Impact perceived | Mitigation measures |
|----------------------------------------------------------------------|----------|-----------------|------------------|---------------------|
| Income and payment compared to male                                  |          |                 |                  |                     |
| Bargain rights                                                       |          |                 |                  |                     |
| Male female ratio                                                    |          |                 |                  |                     |
| List the farm produce which is produced by women mainly              |          |                 |                  |                     |
| List the activity which are mainly done by women                     |          |                 |                  |                     |
| List the reason why is women preferred                               |          |                 |                  |                     |
| List the reason why is women not preferred                           |          |                 |                  |                     |
| What could be the measure to include women                           |          |                 |                  |                     |
| <b>Indigenous People</b>                                             |          |                 |                  |                     |
| What is the forest produces used                                     |          |                 |                  |                     |
| What are the special produces                                        |          |                 |                  |                     |
| Income sources                                                       |          |                 |                  |                     |
| Medical dependence                                                   |          |                 |                  |                     |
| Medicinal dependence                                                 |          |                 |                  |                     |
| Livelihood dependence                                                |          |                 |                  |                     |
| Forest land dependence                                               |          |                 |                  |                     |
| Cultural activity linked with Agricultural Produces/ Forest Produces |          |                 |                  |                     |

## B.2 Industry Checklist

**Name of the Interviewer:**

**Name of the interviewee:**

Date of interview:

Place of interview:

| S. No. | Description                                                                   | Response                            |
|--------|-------------------------------------------------------------------------------|-------------------------------------|
| 1      | Name of the Industry                                                          |                                     |
| 2      | Who is the Owner or Partners of the industry                                  |                                     |
| 3      | What is the Address of the industry                                           |                                     |
| 4      | What are the Contact details of the industry                                  | Telephone:<br>Mobile:<br>e-mail id: |
| 5      | Total area of the industry                                                    |                                     |
| 6      | What is the type of Industry? (small, medium, large, start-up)                |                                     |
| 7      | What are the raw materials used in the industry?                              |                                     |
| 8      | What is the capacity of the industry?                                         |                                     |
| 9      | What is the capacity utilization at which the company is currently operating? |                                     |
| 10     | How does the farm produce reach the industry?                                 |                                     |
| 11     | Are there any quality checks done before accepting the farm produce?          |                                     |
| 12     | What is the raw material specification that you adopt?                        |                                     |
| 13     | If yes, how is the rejected material handled?                                 |                                     |
| 14     | How is the price for the farm produce given to farmers?                       |                                     |

**Name of the Interviewer:**

**Name of the interviewee:**

|    |                                                                                                                            |
|----|----------------------------------------------------------------------------------------------------------------------------|
| 15 | What is the mechanism adopted for cleaning, sorting and grading of raw material?                                           |
| 16 | How much is the storage capacity of the raw material                                                                       |
| 17 | Do you use any preservatives for the raw material during storage                                                           |
| 18 | Do you have facility to monitor the refrigeration and cooling system                                                       |
| 19 | Do you have enclosure technique to minimize damage to raw material                                                         |
| 20 | How much is the power consumption?                                                                                         |
| 21 | What is the source of power?                                                                                               |
| 22 | Do you have back-up power?                                                                                                 |
| 23 | How much is the water consumption?                                                                                         |
| 24 | What is the source of water?                                                                                               |
| 25 | How much is the effluent generation?                                                                                       |
| 26 | What is the capacity of the Effluent Treatment Plant (ETP)?                                                                |
| 27 | What is the capacity of the Sewage Treatment Plant (STP)?                                                                  |
| 28 | Does the industry have measures for air emission control (bag filters, cyclone, ESP scrubbers etc.)                        |
| 29 | What is the solid waste generated from the plant?                                                                          |
| 30 | How is the solid waste managed                                                                                             |
| 31 | Do you adopt resource conservation measures such as water conservation, energy conservation, by product recovery and reuse |
| 32 | What are the odour management measures?                                                                                    |
| 33 | What are the food quality standards adopted by the Industry?                                                               |
| 34 | Where is the market for your product?                                                                                      |
| 35 | Does the industry have women employees?                                                                                    |
| 36 | Does the industry have SC employees?                                                                                       |
| 37 | Does the industry have ST employees?                                                                                       |
| 38 | Are there separate toilet facilities available for male and female employees                                               |
| 39 | Is there creche facility for female employees?                                                                             |
| 40 | What are the problems being faced in warehouse for farm produce                                                            |
| 41 | Is there any Grievance Redress Mechanism, available?                                                                       |
| 42 | In case of any grievance where do you file complaint?                                                                      |
| 43 | How much time does it take to resolve the issue?                                                                           |
| 44 | Where compliant can be filed by hard copy/Mobile/online?                                                                   |

### B.3 Slaughter house checklist

**Name of the Interviewer:**

**Name of the interviewee:**

Date of interview:

Place of interview:

| S. No. | Description | Response |
|--------|-------------|----------|
|--------|-------------|----------|

Name of the Interviewer:

Name of the interviewee:

|    |                                                                                                                             |                                     |
|----|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| 1  | Name of the Slaughter house                                                                                                 |                                     |
| 2  | Who is the Owner or Partners of the slaughter house?                                                                        |                                     |
| 3  | What is the Address of the slaughter house                                                                                  |                                     |
| 4  | What are the Contact details of the slaughter house                                                                         | Telephone:<br>Mobile:<br>e-mail id: |
| 5  | Total area of the slaughter house                                                                                           |                                     |
| 6  | What is the type of slaughter house? (small, medium, large, start-up)                                                       |                                     |
| 7  | What is the capacity of the slaughter house?                                                                                |                                     |
| 8  | What is the capacity utilization at which the company is currently operating?                                               |                                     |
| 9  | How does the goat reach the slaughter house?                                                                                |                                     |
| 10 | Does the slaughter house have license for slaughtering goat?                                                                |                                     |
| 11 | Does the slaughter house have Consent from the pollution control board?                                                     |                                     |
| 12 | Are there any quality checks done before accepting the goat?                                                                |                                     |
| 13 | What is the specification that you adopt?                                                                                   |                                     |
| 14 | If yes, how is the rejected goat handled?                                                                                   |                                     |
| 15 | How is the price for the goat given to farmers?                                                                             |                                     |
| 16 | What are the steps adopted in the slaughter house?                                                                          |                                     |
| 17 | Do the slaughter house has modern method of handling goat?                                                                  |                                     |
| 18 | How much is the storage capacity of the goat?                                                                               |                                     |
| 19 | At what price is the meat sold?                                                                                             |                                     |
| 20 | Where is the meat kept in the slaughter house?                                                                              |                                     |
| 21 | Do you use any preservatives for the goat meat?                                                                             |                                     |
| 22 | How much preservatives are used?                                                                                            |                                     |
| 23 | Do you have facility to monitor the refrigeration and cooling system?                                                       |                                     |
| 24 | How much is the power consumption?                                                                                          |                                     |
| 25 | What is the source of power?                                                                                                |                                     |
| 26 | Do you have back-up power?                                                                                                  |                                     |
| 27 | How much is the water consumption?                                                                                          |                                     |
| 28 | What is the source of water?                                                                                                |                                     |
| 29 | How much is the effluent generation?                                                                                        |                                     |
| 30 | What is the capacity of the Effluent Treatment Plant (ETP)?                                                                 |                                     |
| 31 | What is the capacity of the Sewage Treatment Plant (STP)?                                                                   |                                     |
| 32 | Does the industry have measures for air emission control (bag filters, cyclone, ESP scrubbers etc)                          |                                     |
| 33 | What is the solid waste generated from slaughter house?                                                                     |                                     |
| 34 | How is the solid waste managed?                                                                                             |                                     |
| 35 | Do you adopt resource conservation measures such as water conservation, energy conservation, by product recovery and reuse? |                                     |
| 36 | What are the odour management measures?                                                                                     |                                     |
| 37 | What are the food quality standards adopted by the Industry?                                                                |                                     |
| 38 | Where is the market for your meat?                                                                                          |                                     |
| 39 | How is the meat transported?                                                                                                |                                     |
| 40 | Other than meat what are the other things that are sold from the slaughter house?                                           |                                     |
| 41 | What is the rate at which other material are sold?                                                                          |                                     |
|    | Do you do any traceability study                                                                                            |                                     |

Name of the Interviewer:

Name of the interviewee:

|    |                                                                              |
|----|------------------------------------------------------------------------------|
| 42 | Does the industry have women employees?                                      |
| 43 | Does the industry have SC employees?                                         |
| 44 | Does the industry have ST employees?                                         |
| 45 | Are there separate toilet facilities available for male and female employees |
| 46 | Is there creche facility for female employees?                               |
| 47 | What are the problems being faced by the slaughter house?                    |
| 48 | What are the measures that can be taken for improvement of the sector?       |
| 49 | Is there any Grievance Redress Mechanism available?                          |
| 50 | In case of any grievance where do you file complaint?                        |
| 51 | How much time does it take to resolve the issue?                             |
| 52 | Where complaint can be filed by hard copy/Mobile/online?                     |

## B.4 Checklist for retailers

Name of the Interviewer:

Name of the interviewee:

Date of interview:

Place of interview:

| S. No. | Questions                                                                         | Response              |
|--------|-----------------------------------------------------------------------------------|-----------------------|
| 1      | Name of the Retailer                                                              |                       |
| 2      | What is the type of Retailer (Corporate /SME/ Start-up)?                          |                       |
| 3      | Name of the Promoter / Partners                                                   |                       |
| 4      | Address of the Retailer                                                           |                       |
| 5      | Contact No.                                                                       | Telephone:<br>Mobile: |
| 6      | E-mail ID                                                                         |                       |
| 7      | When was the Retail Set-up?                                                       |                       |
| 8      | What are the commodities handled in the Retail Shop?                              |                       |
| 9      | What is the total land holding of the Retail shop?                                |                       |
| 10     | What is the Landownership status of the market place (RMC, P&RD, ULB or private)? |                       |
| 11     | What is the Rate of lease money for land and where its deposited?                 |                       |
| 12     | Are there mechanism for dissemination of price in the Market?                     |                       |
| 13     | What is the quantity of commodity required by the retailer?                       |                       |
| 14     | Is the desired quantity or the demand met by the retailer?                        |                       |
| 15     | What is the Average distance between the CBO/Market/Farmer from the retailer?     |                       |
| 16     | How are the commodities transported to the retailer?                              |                       |
| 17     | How much is the storage space available with the retailer?                        |                       |
| 18     | Does the retailer have cold storage facility?                                     |                       |
| 19     | Retailer has how many collection centres?                                         |                       |
| 20     | Does the retailer have any contract signed with the supplier?                     |                       |
| 21     | How are the commodities transported to the Consumers?                             |                       |
| 22     | What are the quality standards set for the commodity by the retailer?             |                       |
| 23     | Are there any quality checks done by the retailer before accepting the commodity? |                       |

Name of the Interviewer:

Name of the interviewee:

|    |                                                                                                                                         |                             |
|----|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| 24 | How is the rejected material handled by the retailer?                                                                                   |                             |
| 25 | Are there any processing and packaging facility with the retailer?                                                                      |                             |
| 26 | Are there any use of preservatives during storage of commodity?                                                                         |                             |
| 27 | What are the preservatives used?                                                                                                        |                             |
| 28 | How much quantity of preservatives are used?                                                                                            |                             |
| 29 | Does the retailer have power connectivity?                                                                                              |                             |
| 30 | How much is the power requirement?                                                                                                      |                             |
| 31 | Does the Retailer has weighing facility?                                                                                                |                             |
| 32 | How is the waste managed by the retailer?                                                                                               |                             |
| 33 | How many workers are there with the retailer?                                                                                           |                             |
| 34 | Are there any female workers?                                                                                                           |                             |
| 35 | Are there any SC/ST workers?                                                                                                            |                             |
| 36 | If there is any increase/decrease of charge, is it based on Government schedule or as per the lessee's assessment?                      |                             |
| 37 | How the price of commodities fixed (auction or negotiation)?                                                                            |                             |
| 38 | How is the price disclosure system in the market (price display)?                                                                       |                             |
| 39 | Are there any D.G set used by the retailer?                                                                                             |                             |
| 40 | Are the D.G sets noise compliant and has stack attached                                                                                 |                             |
| 41 | How many woman sellers approach retailer?                                                                                               |                             |
| 42 | How many SC sellers are approach retailer?                                                                                              |                             |
| 43 | How many SC sellers approach retailer?                                                                                                  |                             |
| 44 | Are there any plans for increasing the capacity?                                                                                        |                             |
| 45 | Does the expansion plan require additional land for expansion?                                                                          |                             |
| 46 | Does additional land requirement involve acquisition of private land?                                                                   |                             |
| 47 | Are there any Food quality standards being complied by the Retailer?                                                                    |                             |
| 48 | Do the Retailer has FSSAI license?                                                                                                      |                             |
| 49 | What are the issues being faced the retailer?                                                                                           | Transportation:<br>Storage: |
| 50 | Do you face any challenges that are particularly due to climate change? For example, damage to commodity due to increased temperatures. |                             |
| 51 | Is there any Grievance Redress Mechanism available?                                                                                     |                             |
| 52 | In case of any grievance where do you file complaint?                                                                                   |                             |
| 53 | How much time does it take to resolve the issue?                                                                                        |                             |
| 54 | Where complaint can be filed by hard copy/Mobile/online?                                                                                |                             |

## C. Detailed Legal and Policy Review

### C.1 Applicable Environmental Rules and Regulations of Government of India

The list of central government regulations with respect to environment and its applicability is as indicated in the table below.

**Table 75: Applicable Central Rules and Regulations on Environment**

| S. No. | Relevant Act / Rule                      | Key features                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Project Applicability                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1      | Environmental Protection Act (EPA), 1986 | <p>EPA Act, 1986 is an umbrella Act that authorizes the central government to take measures to protect and improve the environmental quality and preventing controlling and abating environmental pollution.</p> <p>The Act provides central government the power to give direction of closure, prohibition or regulation of an industry.</p> <p>Environmental Impact Assessment (EIA) has been made mandatory as per the notification under the Act for projects listed in schedule to the notification.</p> <p>The Environmental Protection Rules lay down procedure for setting up standard of emission or discharge environmental pollutants and hazardous substance management.</p> | <p>The Act will be applicable to the project since the investment is likely to facilitate enhancement in the capacity of existing Food Processing Industry and Slaughter houses and is likely to facilitate setting up of warehouses and retails outlets by leading Corporates.</p> <p>It is necessary that the bidding contract with these corporates include clauses to adhere to the provisions of the EPA Act and requirement of obtaining Environmental Clearance or Costal Regulation Zone Clearances.</p> |
| 2      | Water Act 1974 and Amended 1988          | <p>The Act provides for the prevention and control of water pollution and maintaining and restoring the wholesomeness of water in the country.</p> <p>Section 25 of the Act stipulates that no person shall establish or take steps to establish industry, operation or process or any treatment and disposal system which is likely to discharge sewage or trade effluent into a stream or well or sewer or land without prior consent from the Concerned State Pollution Control Board (SPCB)</p>                                                                                                                                                                                      | <p>The Act will be applicable since the investment is likely to facilitate enhancement in capacity of food processing industry or slaughter houses or setting -up of new retail outlets by leading corporates.</p> <p>It is necessary that the bidding contract with these corporates includes clauses to adhere to the provisions of Water Act and requirement of obtaining Consent under Section 25 of the Act.</p>                                                                                            |
| 3      | Air Act 1981                             | <p>The Act provides for the prevention, control and abatement of air pollution for the establishment. Section 21 of the Act stipulates that no person shall without prior consent of the SPCB establish or operate any industry in air pollution control area. And no person operating an industrial plant in air pollution control area shall discharge or cause or permit to discharge the emission of any air pollutants in excess of the standard laid down by the state board.</p>                                                                                                                                                                                                  | <p>The Act will be applicable since the investment is likely to facilitate enhancement in capacity of food processing industry or slaughter houses or setting up of new retail outlets by leading corporates.</p> <p>It is necessary that the bidding contract with these corporates includes clauses to adhere to the provisions of Air Act and requirement of obtaining Consent under Section 21 of the Act. Operation of D.G set will also require NOC from Maharashtra SPCB.</p>                             |
| 4      | Forest Conservation Act 1980             | <p>The Forest Conservation Act 1980 was enacted to conserve the Country's forest and it strictly restricts and regulates the de-reservation of forest or use of forest land for non-forest purpose without prior approval of Central Government. The Act has laid down the pre-requisites for the diversion of forest land for non-forest purpose.</p>                                                                                                                                                                                                                                                                                                                                   | <p>The Consultants understands that the project does not involve any acquisition or diversion of forest land. But, in case of expansion of any existing infrastructure or Agri food industries that required forest land may attract diversion of forest and hence the Act will be applicable. However, the chances are rare.</p>                                                                                                                                                                                |

| S. No. | Relevant Act / Rule                                                            | Key features                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Project Applicability                                                                                                                                                                                                                                                                                                                                                            |
|--------|--------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5      | The National Green Tribunal Act, 2010                                          | The National Green Tribunal Act 2010 led to the establishment of National Green Tribunal for effective and expeditious disposal of cases relating to environmental protection and conservation of forests and other natural resources including enforcement of any legal right relating to environment and giving relief and compensation for damages to person and property and for matters connected therewith or incidental thereto.                                                                                                     | The Act may be applicable with respect to area where developmental activities of the project may cause any damage to the environment and property.                                                                                                                                                                                                                               |
| 6      | Disaster Management Act 2005                                                   | The Disaster Management Act, 2005 has been enacted as the central Act to deal with the management of disaster.                                                                                                                                                                                                                                                                                                                                                                                                                              | The Consultants note that districts of Raigad, Ratnagiri and Satara are the districts that lie in seismic zone IV, western and north western district lie in zone III and central eastern district lie in Zone II. In accordance of the seismicity of the area any construction activity / intervention shall be conducted and accordingly the bidding contract shall be framed. |
| 6      | Energy Conservation Act 2001                                                   | The Energy Conservation Act, 2001 requires large energy consumers to adhere to energy consumption norms, new building to follow the energy conservation and building code and appliances to meet energy performance standard and to display energy consumption labels.                                                                                                                                                                                                                                                                      | The Consultants note that the project involve investment in energy efficient equipment and energy conservation measures in the agriculture value chain.                                                                                                                                                                                                                          |
| 7      | The Biological Diversity Act 2002                                              | The Biological Diversity Act 2002 is the Act to preserve the biological diversity of India and provides for suitable mechanism for equitable sharing of benefits arising out of the use of traditional biological resources and knowledge.                                                                                                                                                                                                                                                                                                  | The Consultants note that the project does not involve use of biological resources or associated knowledge for commercial or research purpose and sharing of benefits out of it. However, the Act can be used as guideline to prevent planning of project components near ecologically sensitive areas including National Parks and Sanctuaries.                                 |
| 8      | Prevention of Food Adulteration Act 1954                                       | The Prevention of Food Adulterations Act 1954 make provision for prevention of adulteration of Food and prevents import, manufacture sale or distribution of adulterated and misbranded food. It regulates use of colour, preservatives and other ingredients that are injurious to health and prescribes standards and prohibits misbranded foods. Central Government has established laboratories at Kolkata, Ghaziabad, Mysore and Pune for analysis of samples and fixation of standard and quality control parameter for food article. | The Act is applicable since the investment is likely to facilitate enhancement of capacity of food processing, cleaning, grading, marketing of agriculture commodities.<br><br>The relevant provisions of the Act shall be included in the bidding documents with the Corporates.                                                                                                |
| 9      | Hazardous and Other Waste (Management Handling and transboundary moment) Rules | The Rule ensures resource recovery and disposal of hazardous waste in an environmentally sound manner. The Rule includes waste management hierarchy in the sequence of priority of prevention, minimization, reuse, recycling, recovery, co-processing and safe disposal of hazardous waste.                                                                                                                                                                                                                                                | The Act is applicable since there will be use of agro-chemical and fertilizers in the agricultural and other allied activities in the project area and unused chemical and their containers and packages shall be disposed as per the provisions of this act.                                                                                                                    |
| 10     | Solid Waste Management Rules, 2016 and Construction and Demolition Waste       | These Rules shall be applicable to every Urban Local Body, Outgrowth in urban agglomerations, census towns in notified area. As per the provision of the SWM rules waste shall be segregated at source in three bins, construction and demolition waste shall be handled separately as per                                                                                                                                                                                                                                                  | The SWM and CDW Rules shall be applicable since the investment facilitates setting up of warehouse, markets, cold storages, processing facilities and retails and hence the municipal waste generated from these facilities shall be handled as per                                                                                                                              |

| S. No. | Relevant Act / Rule                                                                                                      | Key features                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Project Applicability                                                                                                                                                                                                                                                                                                                                          |
|--------|--------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        | Management Rules, 2016                                                                                                   | CDW Rules and horticulture waste and garden waste generated shall be stored separately. No waste generated shall be thrown, burned or buried on streets, open public space or in drain or water bodies.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | SWM rules and any new construction activity shall comply with CDW Rules. The bidding contract with the corporates shall include adherence to provisions of these Rules.                                                                                                                                                                                        |
| 11     | Insecticide Act 1968 and Rules 1971                                                                                      | The Insecticide Act 1968 and Rules 1971 regulate the import, manufacture, sale, transport, distribution and use of insecticides with a view to prevent risk to the human beings or animals. Insecticide is defined as substance including fungicides and weedicides as central government may notify. The Act mandates registration of insecticide, license to manufacturers, packaging and labelling. The Act also has guidelines stipulated for protective clothing of persons handling insecticides. Disposal of used packages, surplus material and washing of insecticides are also included in the Act.                                                                                                                                                                                                                                                                               | The SMART Project does not include procurement, stocking or sale of insecticides. However, in case of any emergency outbreak of any disease, the Act shall be applicable. In case of usage the farmers shall be trained for the safe usage of insecticides and disposal of its container and packaging material in safe manner.                                |
| 12     | Fertilizer Control Order 1985                                                                                            | The Fertilizer control Order 1985 administered by the Department of Agriculture Cooperation, GOI has been issued under the Essential Commodities Act 1955. The Order lay down as to what substance qualify for use as fertilizer in the soil, product-wise specification, methods of sampling and analysis of fertilizer, procedure for obtaining license / registration as manufacturers / dealers in fertilizers and condition to be fulfilled for traders thereof.                                                                                                                                                                                                                                                                                                                                                                                                                       | The Fertilizer Control Order shall be applicable since the project will not support procurement of fertilizer from unauthorized vendors to be used for farming.                                                                                                                                                                                                |
| 13     | Food Safety and Standards (Food Products Standards and Food Additives) Act 2006 and Rules, 2011 and subsequent amendment | The FSSAI consolidates laws relating to food and lays down scientific standard for articles of food. It regulates their manufacturing storage, distribution, sale and import to ensure availability of safe and wholesome food for human consumption. It's a single reference point for all matters related to food safety and standard, regulation and enforcement.<br>The Act provides for regulation of food import in the country, provision for food recall, surveillance, new enforcement structure, envisages large network of food labs, new justice dispensing system for fast track disposal of cases, harmonization of domestic standard with international food standard, covers health food supplements, nutraceuticals, Issuing license within time frame, compensation to victims, reward to informers, registration for small vendors and central licensing from Authority. | The Act shall be applicable since the investment will facilitate enhancement in agriculture-based commodities, processing and grading facilities, infrastructures such as market, warehouse, retail etc which will develop agri-business and agricultural productivity.                                                                                        |
| 14     | Fruit Products Order (FPO), 1955                                                                                         | Fruit and Vegetable Processing sector is regulated by the Fruit Products Order 1955, which is administered by the Ministry of Food Processing Industries, GOI.<br>The main objective is to lay down quality standard to manufacture fruit and vegetable products maintaining sanitary and hygienic conditions in the premises.<br>It is mandatory for all manufactures of fruit and vegetable products including some non-fruit product like non-fruit vinegar,                                                                                                                                                                                                                                                                                                                                                                                                                             | The proposed investment will result in interventions in the agriculture sector to enhance infrastructure facilities like warehouse, market, retails where hygienic conditions needs to be maintained as per the standards specified by FSSAI. Further the intervention is also proposed in CBOs / FPCs where the guidelines of the order needs to be complied. |

| S. No. | Relevant Act / Rule                                                  | Key features                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Project Applicability                                                                                                                                                                                                                                                                                                                                 |
|--------|----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        |                                                                      | <p>syrup and sweetened aerated water to obtain license under this order.</p> <p>There is an FPO mark that is mandatory on all processed fruit products sold in India such as fruit beverages, fruit-jam, crushes and squashes, pickles, dehydrated fruit product and fruit extracts, following the FSSAI Act 2006.</p> <p>The Order lay down standards for packing, marking, and labelling of container of fruit products. It also lays down specification and quality control requirement on production and marketing. It also lays down specification on limits of poisonous metals in fruit products, permissible limits for food colours, permitted preservatives in fruit products and other permitted additives.</p>                                                               |                                                                                                                                                                                                                                                                                                                                                       |
| 15     | Milk and Milk Products Order (MMPO) 1992                             | <p>GOI has promulgated the MMPO 1992 under the provisions of Essential Commodities Act 1955. As per the provisions of this order, any person/dairy plant handling more than 10,000 litres per day of milk or 500 MT of milk solids per annum needs to be registered with the Registering Authority appointed by Central Government.</p> <p>The objective of the order is to maintain and increase the supply of liquid milk of desired quality in the interest of the public and for regulating the production, processing and distribution of milk and milk products.</p>                                                                                                                                                                                                               | <p>The Consultants note that the list of commodities under the Project includes goat and sheep rearing and dairy is not included in the list of commodities. MMPO will be applicable if the proposed intervention includes facilitation to clusters of dairy sectors</p>                                                                              |
| 16     | Meat Food Products Order, 1973 under Essential Commodities Act, 1955 | <p>Meat Food Products order 1973 promulgated under the provisions of Essential Commodities Act 1955 provides for sanitary and other requirements, limit of heavy metals, preservatives, insecticides, residue etc for meat products. This order was being implement by Ministry of Rural Department in the Ministry of Rural Area and Employment.</p> <p>Meat and Meat products are highly perishable in nature and can transmit disease from animals to human beings.</p> <p>Processing of meat products is licensed under the Meat Food Products Order 1973. Further the Order specify the minimum sanitary requirement to be complied, hygienic requirements to be complied and requirements with respect to packing, marketing and labelling of container of meat food products.</p> | <p>The Consultants note that the proposed intervention include goat and sheep rearing farmers, backyard farming and subsequent value chain such as slaughterhouses, cold storages and retails. Hence guidelines under Meat Food Products order shall be applicable and the project shall support only licensed slaughterhouses under the Project.</p> |
| 17     | Prevention of Cruelty to Animals (Slaughter House) Rules, 2001       | <p>The Slaughter house rules define slaughter house as a place where 10 or more than 10 animals are slaughtered per day and is duly licensed under the Central, state and Province Act. The Act prohibits slaughtering of animal which is pregnant or has offspring which is less than 3 months old, animal below the age of 3 months and which are not certified by a veterinary Doctor.</p> <p>The Rule prohibits slaughtering of animal in slum, roadside meat shop or in dhabas.</p>                                                                                                                                                                                                                                                                                                 | <p>Since the project intervention includes slaughter houses, and backyard farming, the Rule is applicable, and guidelines of the rule shall be complied.</p>                                                                                                                                                                                          |

| S. No. | Relevant Act / Rule                                                                                                        | Key features                                                                                                                                                                                                                                                                                                                                                                           | Project Applicability                                                                                                                                                                                               |
|--------|----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        |                                                                                                                            | The Rule also stipulates the requirements of slaughter houses.<br>The Rule on prevention of cruelty to animals stipulates penalty for any sort of cruelty on animal, control and supervision for experimenting on animal.                                                                                                                                                              |                                                                                                                                                                                                                     |
| 18     | Forest Right Act - 2006, The Scheduled Tribe and Other Traditional Forest Dwellers (Recognition of Forest Right) Act, 2006 | This s Act recognize and vests forest right in the forest dwelling schedule tribes and other traditional forest dwellers for collection of minor forest produce access to grazing grounds and water bodies and traditional areas of use of Nomadic or pastoral communities                                                                                                             | The Act shall be applicable since the Project intervention related activities such as infrastructure development and cluster-based organization coming in Tribal Districts shall be as per the preview of this Act. |
| 19     | The Plastic Waste Management Rules, 2016                                                                                   | The Rule has been enforced for effective management of plastic waste and give thrust on plastic waste minimization, segregation at source, recycling, involving waste pickers, recyclers and waste processors in collection of plastic waste fraction either from household or any other sources of its generation and adopts polluter pay principle for sustainable waste management. | The guidelines of the Rule shall be complied during the construction and implementation stage of the Project.                                                                                                       |

Source: MM Secondary review

## C.2 State Environmental Laws and Regulations

The list of state regulations with respect to environment and its applicability is indicated in table below.

**Table 76: Applicable State Rules and Regulations of Environment**

| S. No | Name of relevant Act / Rule                                                          | Key features                                                                                                                                                                                                                                                                                 | Project Applicability                                                                                                                                                                   |
|-------|--------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | Maharashtra Water Policy 2003                                                        | Creating incentives for efficient and productive water use and empowering local farmer institutions known as Water User Association.                                                                                                                                                         | The Policy guidelines shall be followed by promoting water conservation measures in the agriculture value chain.                                                                        |
| 2     | Maharashtra Management of Irrigation System by Farmers Act 2005 and Rules thereunder | To involve farmers in various aspects of management of irrigation system. Create Water User Association for equitable distribution of water, maintain irrigation system, efficient usage of water for optimal agricultural production, protect environment and ensure ecological balance.    | The guidelines of the Act shall be followed by promoting water conservation measures during farming and efficient use of irrigation water.                                              |
| 3     | Maharashtra Water Resource Regulatory Authority Act 2005                             | To provide for establishment of MWRRA to regulate water resource within the State, facilitate and ensure judicious, equitable and sustainable management, allocation and utilization of water resource and fix rates for use of water for agriculture, industry, drinking and other purposes | The guidelines of the Act on sustainable and efficient use of water shall be followed by promoting efficient and sustainable use of water during farming as well as in the value chain. |
| 4     | Maharashtra Ground Water (Development and Management) Rules                          | The Rule is in the draft stage. The rules have made a provision that will require farmers in the notified ground water stressed area to seek permission before sowing water intensive crop. Also provides to seek permission before sinking any new well.                                    | The Project shall ensure that the Act is complied with and necessary permission / approvals are obtained by the Project beneficiaries.                                                  |

| S. No | Name of relevant Act / Rule                                            | Key features                                                                                                                                                                                                                                                                                                                                                                                                                               | Project Applicability                                                                                                                                                        |
|-------|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5     | Maharashtra Biological Diversity Rules, 2008                           | The Act provides for conservation of biological diversity, sustainable use of biological resources and equitable sharing of benefits arising out of the use of biological resources. The Act requires approval for commercial utilization or bio-survey and bio-utilization of any biological resource by resident Indian National or from Industries registered in India which have at least 51 percent share capital of Indian citizens. | The Project shall ensure that the Act is complied with and necessary permission / approvals are obtained by the Project beneficiaries.                                       |
| 6     | Maharashtra Felling of Trees (Regulation) Act, 1964                    | The Act provides regulation on felling of certain trees in the state of Maharashtra for the purpose of preservation thereof and for protection of the soil against erosion and to provide for matters connected therewith. The Act stipulates requirement of permission from Tree officer of the State government prior to felling of tree.                                                                                                | The provision of the Act shall be complied in case felling of trees are required for any proposed expansion of warehouse or market or FPOs / FPCs.                           |
| 7     | Maharashtra Air (Prevention and Control of Pollution) Rules, 1983      | The Maharashtra state has formulated Rules under the Air Act 1981 in consultation with the state board for prevention and control of Air Pollution.                                                                                                                                                                                                                                                                                        | The Rule shall be applicable since any expansion or modification which is likely to add emission to air environment shall require prior consent from the MSPCB.              |
| 8     | Maharashtra Water (Prevention and Control of Pollution) Rules, 1983    | The Maharashtra state has formulated rules under the Water Act 1974 in consultation with the state board for prevention and control of water pollution.                                                                                                                                                                                                                                                                                    | The Rule shall be applicable since any expansion or modification which is likely to add emission to air environment shall require prior consent from the MSPCB.              |
| 9     | Maharashtra Pollution Control Board on Poultry and Cattle (Goat) Sheds | The Circular provides categorization of animals in terms of its weight, classification of slaughter houses, type of solid waste and recommended methods of disposal and capacity of biogas plant.                                                                                                                                                                                                                                          | The Project intervention includes slaughter houses and hence the guidelines of the circular shall be complied by the slaughterhouse proposed to be benefited by the Project. |

Source: MM Secondary review

### C.3 Relevant Central and State Government Schemes and Programs on Environment

Centre and the State Governments have been implementing several schemes / programmes under Central Schemes, Centrally Sponsored Schemes and State Schemes, that are relevant to the project. Some of these schemes and their salient features are discussed below:

**Table 77: Relevant central and State Government Schemes and Programs on Environment**

| Name of scheme / program | Key features                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Neem Coated Urea         | <ul style="list-style-type: none"> <li>● Neem coating leads to more gradual release of urea helping plants gain more nutrients and resulting in higher yield.</li> <li>● Neem-coating will help check heavily subsidized urea's pilferage to chemical industry and other uses such as making of adulterated milk.</li> <li>● On 25th May 2015, Department of Fertilizers made it mandatory for all domestic producers of urea to produce 100 percent Neem Coated Urea with an extra MRP of 5 percent.</li> <li>● Entire quantity of indigenously produced urea and imported urea is being neem coated from 1st September and 1st December 2015 respectively.</li> </ul> |

**Name of scheme / program**

**Key features**

|                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Smart Food Initiative founded by the ICRISAT                               | <p>The Smart Food initiative is founded by the International Crop Research Institute for Semi-Arid Tropics (ICRISAT) with the aim to build food system where food is high in nutrition, good for planet and good for the smallholder Farmer. Millets including sorghum are the foods in focus. The goal is to accelerate and popularise investment and support for the research and development of value chain of millet.</p> <p>It is a global campaign for foods that ensure well-being of people and the environment along with better incomes for smallholder farmers of Asia and Africa.</p> |
| Strengthening & Modernization of Pest Management approach in India (SMPMA) | <p>Strengthening and modernization of Pest Management Approach in India is a central sector scheme having components such as Integrated Pest Management, Locust Control and Research and Implementation of Insecticides Act.</p> <p>IPM packages of practice has been developed for 87 crops, Posters, manuals and Farmer's guide has been prepared for rice and cotton</p>                                                                                                                                                                                                                       |

Source: MM Secondary review

## C.4 Applicable Social Acts and Rules

**Table 78: Applicable social legislations**

| S. No. | Applicable Act                                       | Key features                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Relevance to Project                                                                                                                                                                                                                                                                                                                                                           |
|--------|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.     | Agricultural Produce (Grading and Marking) Act, 1937 | <p>The Agriculture Produce (Grading and Marketing) Act 1937 was enacted to provide for rating and marking of the products taken from agriculture including other products.</p> <p>The Act provides for fixing grade designation to indicate quality, defining quality indicated to every grade, specify grade designated marks, authorising person or body to prescribe mark, specifying condition for manner of marking, penalty for an authorised marking with grade designated mark, penalty for counterfeiting grade designated mark and penalty for selling miss-graded articles.</p> | The Act will be applicable since the investment includes intervention to enhance agricultural value chain.                                                                                                                                                                                                                                                                     |
| 2.     | National seed Policy 2002                            | National Seed Policy has been launched to provide for intellectual protection of new varieties, creation of new infrastructure facilities along with strengthening of existing facilities, use of biotechnology, import policy to make best planting material available in the world to Indian farmers after meeting quality standard, long term policy for export of seeds, promotion of domestic seed variety                                                                                                                                                                            | The Policy shall be applicable since the Project intervention are intended to support enterprise growth and expanding market access.                                                                                                                                                                                                                                           |
| 3.     | The Seeds Act, 1966                                  | The Seed Act, 1966 provides legal framework around seed certification and make good quality seed available to cultivators. It covers seed of food crop, oil crop, cotton seed, seeds of cattle fodder and all type of vegetative propagative material.                                                                                                                                                                                                                                                                                                                                     | <p>The Act shall be applicable since the seed production at village or cluster level that will supply seed to all members farmers of the producer group. The Act will be also applicable in case where mass procurement and distribution of seed is done through Producer Groups.</p> <p>The SMART project will support only truthfully labelled seeds or certified seeds.</p> |
| 4.     | Rural Producers Companies Act, 2002                  | The concept of Producer Companies was introduced in 2002 by incorporating a new Part IXA in to the Companies Act 1956 with the aim to frame legislation that would enable incorporation of cooperatives as                                                                                                                                                                                                                                                                                                                                                                                 | The Act shall be applicable as the Project intervention will facilitate expansion or enhancement of Agri-enterprise and Agri-production                                                                                                                                                                                                                                        |

| S. No. | Applicable Act                                                                    | Key features                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Relevance to Project                                                                                                         |
|--------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
|        |                                                                                   | <p>companies and conversion of existing cooperatives into companies and ensure unique elements of cooperative business with a regulatory framework like that of companies.</p> <p>Producer Companies perform activities such as production, harvesting, processing, procurement, grading, pooling, handling, marketing, selling, export of primary produce of the members or import goods or services for their benefit.</p>                                                                                                                                                                              | common facilitation centre and Producer Farmer Group                                                                         |
| 5.     | Agricultural Produce (Grading and Marking) Act, 1937                              | <p>The Agriculture Produce (Grading and Marketing) Act 1937 was enacted to provide for rating and marking of the products taken from agriculture including other products.</p> <p>The Act provides for fixing grade designation to indicate quality, defining quality indicated to every grade, specify grade designated marks, authorising person or body to prescribe mark, specifying condition for manner of marking, penalty for an authorised marking with grade designated mark, penalty for counterfeiting grade designated mark and penalty for selling miss-graded articles.</p>                | The Act will be applicable since the investment includes intervention to enhance agricultural value chain.                   |
| 6      | APMC Act 2003 and its amendments                                                  | <p>APMC Act empowers state government to notify the commodities and designate market and market areas where the regulated trade takes place.</p> <p>The Act also provides for the formation of Agriculture Produce Market Committees that are responsible for the operation of the market</p>                                                                                                                                                                                                                                                                                                             | The Act shall not be applicable since the project interventions at market level.                                             |
| 7      | Producer Company registered under the Companies Act, 2013                         | <p>A producer company is basically a body corporate registered as producer company under Company Act 2013. Only persons engaged in an activity connected with, or related to, primary produce can participate in the ownership. The members are necessary to be primary producers. Termed as "Companies with Limited Liability" and the liability of the members will be limited to the amount, if any, unpaid on the shares. Name of the company shall end with producer company limited and shall be treated as a private limited company for application of law and administration of the Company.</p> | The Act shall be applicable since the intervention will result in expansion and technical enhancement of producer companies. |
| 8      | Maharashtra Agricultural Produce Marketing (Development and Regulation) Act, 1963 | <p>The Act regulate the marketing of agriculture and pisciculture produce in Market area. The Act provides for establishment of Market Committees in the State. These Market Committees are engaged in development of market yards for the benefit of agriculturists and the buyers.</p>                                                                                                                                                                                                                                                                                                                  | The provisions of the Act shall not be complied as the intervention includes Markets.                                        |

Source: MM Secondary review

## C.5 Relevant Central and State Government Social Schemes and Programs

Some of these schemes and their salient features are discussed below:

**Table 79: Relevant central and State Government Social Schemes and Programs**

| Name of scheme / program                           | Key features                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| National Policy for Farmers 2007                   | <p>As per Agriculture Annual report 2017-18, the Government of Maharashtra (GoM), has adopted the strategy to achieve a target of doubling farmers income by 2022 with special focus on:</p> <ul style="list-style-type: none"> <li>● efficient irrigation system (“Per Drop More Crop”),</li> <li>● Quality seed and nutrients based on soil health,</li> <li>● investment in warehouse and cold chains,</li> <li>● value addition through food chain,</li> <li>● crop insurance scheme to mitigate risk at affordable price and</li> <li>● ancillary activities such as poultry, bee keeping and fisheries</li> </ul>                                                                                                                                                               |
| Pradhan Mantri Krishi Sinchayee Yojana             | <p>Objective of the scheme is to:</p> <ul style="list-style-type: none"> <li>● achieve convergence of investment in irrigation at field level,</li> <li>● expand cultivable area under assured irrigation,</li> <li>● improve on-farm water use efficiency to reduce wastage of water,</li> <li>● enhance the adoption of precision-irrigation and other water saving technologies.</li> </ul> <p>During 2017-18, an amount of Rs.1610 crores and Rs.594.90 crores have been released as on 31st December 2017 to states for “Micro-irrigation” and for “Other Interventions” respectively under “Per Drop More Crop” component. An area of about 4.97 lakh Ha has been covered under Micro Irrigation and 39,808 water harvesting structure constructed till 31st December, 2017</p> |
| Pradhan Mantri Fasal Bima Yojana                   | <ul style="list-style-type: none"> <li>● The scheme was introduced on 14<sup>th</sup> Jan 2016 in a move aimed at reducing agricultural distress and farmers welfare.</li> <li>● All farmers including sharecroppers and tenant farmers growing notified crops in notified area are eligible for coverage.</li> <li>● The scheme covers food crops, oilseeds and annual commercial / horticulture crops.</li> <li>● The coverage of risk is for prevented sowing / planting risk, standing crop, post- harvest losses and localized calamities</li> </ul>                                                                                                                                                                                                                             |
| Soil Health Card Scheme                            | <ul style="list-style-type: none"> <li>● Soil Health Card will provide information to the farmers on soil nutrient status of their soil and recommendations on appropriate dosage of nutrients to be applied to improving soil health and fertility.</li> <li>● Soil health card are to be issued every two years for all land holdings in the country to promote balance and integrated use of plant nutrients.</li> <li>● Under the scheme 239.73 lakh soil samples collected and 444.58 lakh soil Health Cards issued by States, as on 03.01.2017.</li> </ul>                                                                                                                                                                                                                      |
| Paramparagat Krishi Vikas Yojana                   | <ul style="list-style-type: none"> <li>● Launched in 2015, it is one of the schemes under National Mission for Sustainable Agriculture to promote certified organic cultivation.</li> <li>● The scheme targets to form 10,000 clusters of 20 Ha each and bring nearly two lakh hectares of agriculture area under organic farming by 2017-18.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                              |
| e-National Agriculture Market (e-NAM)              | <ul style="list-style-type: none"> <li>● e-NAM is a pan India electronic trading portal developed under the National Agriculture Market scheme.</li> <li>● e-NAM is being deployed in selected regulated wholesale market in state across the country and 585 markets are proposed to be integrated with e-NAM.</li> <li>● States are required to carry out pre-requisite reforms to enable a single license to be valid across the state, single point levy of market fee and provision for electronic auction as a mode of price discovery</li> </ul>                                                                                                                                                                                                                               |
| Integrated Scheme for Agriculture Marketing (ISAM) | <p>The scheme has an INR 4500 Cr outlay in 12<sup>th</sup> plan and provides for the following:</p> <ul style="list-style-type: none"> <li>● Promotion of Agri-marketing through creation of marketing and agribusiness infrastructure including storage,</li> <li>● Incentivizing Agri-market reforms,</li> <li>● Providing market linkage to farmers,</li> <li>● Provide access to Agri—market information and</li> <li>● Support quality certification for agriculture commodity.</li> </ul> <p>The scheme components are creation of agricultural marketing infrastructure and marketing research and information network,</p>                                                                                                                                                    |

**Name of scheme / program**

**Key features**

|                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Mission for Integrated Development of Horticulture (MIDH)</p>            | <p>MIDH is a centrally sponsored scheme for the holistic growth of horticulture sector covering fruits vegetables, root and tuber crop, mushroom, spices, flowers, aromatic plants, coconuts, cocoa and bamboo. Main objective of the mission is to:</p> <ul style="list-style-type: none"> <li>● Promote holistic growth of horticulture sector which shall include research, technology promotion, extension, post harvesting management, processing and marketing;</li> <li>● Encourage farmers to form groups such as FPOs, FPC;</li> <li>● Enhance horticulture production, augment farmers, income and strengthen nutritional security;</li> <li>● Improve productivity by way of quality germplasm, planting material and water use efficiency through Micro Irrigation; and</li> <li>● Support skill development and create employment generation opportunities for rural youth in horticulture and post-harvest management, especially in the cold chain sector.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <p>National Mission on Agricultural Extension and Technology under ATMA</p> | <p>The implementation of National Mission of Agriculture Extension and Technology (NMAET) started in 1.4.2014. The scheme promotes decentralized farmer-driven and farmer-accountable extension system through an institutional arrangement for technology dissemination in the form of an Agricultural Technology Management Agency (ATMA) at district level. Under the scheme grants-in-aid is released to states governments with an objective to support their efforts of revitalization of the extension system and making available the latest agricultural technologies in different thematic areas to increase agricultural production through extension activities viz. Farmers Training, Demonstrations, Exposure Visits, Kisan Mela, Mobilization of Farmers Groups and Setting up of Farm Schools. Through these activities, latest agriculture technologies are disseminated to farmers of the country.</p> <p>An autonomous institution viz. Agricultural Technology Management Agency (ATMA) set up at district level is responsible to ensure delivery of extension services to farmers. ATMA Governing Board is the apex body of ATMA which provides overall policy direction. ATMA Management Committee is the executive body looking after implementation of the scheme. District Farmers Advisory Committee is a body to provide farmers' feedback for district level planning and implementation. ATMA is the district level nodal agency responsible for overall management of agriculture extension system within the district, including preparation of Strategic Research and Extension Plan (SREP).</p> |
| <p>Agri Udaan scheme</p>                                                    | <p>The Central Government has launched Agri Udaan Food and Agribusiness Accelerator 2.0 to promote innovation and entrepreneurship in agriculture. Accelerators are 4 – 8 months program aiming at scaling up innovative start-ups with a working prototype and initial market traction. This is done through education, mentorship, and financing. Start-ups enter accelerators for a fixed-period of time, and as part of a cohort. The cohort is shortlisted by evaluation panel comprising of industry veterans, business experts, R&amp;D scientists. Four distinct factors that make accelerators unique are fixed term, cohort based, mentorship driven, and they culminate into demo day.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

## D. Socio-economic Profile

**Table 80: Workforce Participation Rate (WPR), 2011**

| S. No. | District        | Total Workers | Total WPR | Main WPR | Male WPR | Female WPR | WPR in Primary Sector |
|--------|-----------------|---------------|-----------|----------|----------|------------|-----------------------|
| 1.     | Ahmednagar      | 2,204,590     | 48.53     | 44.89    | 55.50    | 41.10      | 71.91                 |
| 2.     | Akola           | 768,154       | 42.35     | 38.1     | 55.81    | 28.11      | 67.46                 |
| 3.     | Amravati        | 1,236,322     | 42.80     | 36.75    | 56.56    | 28.33      | 70.11                 |
| 4.     | Aurangabad      | 1,575,079     | 42.55     | 39.08    | 52.79    | 31.47      | 60.39                 |
| 5.     | Bhandara        | 597,305       | 49.76     | 34.48    | 56.98    | 42.41      | 72.88                 |
| 6.     | Beed            | 1,255,548     | 48.57     | 44.67    | 53.95    | 42.70      | 78.04                 |
| 7.     | Buldana         | 1,219,641     | 47.16     | 42.82    | 54.88    | 38.89      | 81.06                 |
| 8.     | Chandrapur      | 1,058,172     | 48.00     | 36.49    | 57.71    | 37.91      | 65.67                 |
| 9.     | Dhule           | 9,36,370      | 45.66     | 40.27    | 54.12    | 36.71      | 71.41                 |
| 10.    | Gadchiroli      | 5,84,237      | 54.45     | 36.62    | 59.73    | 49.08      | 80.99                 |
| 11.    | Gondiya         | 6,65,419      | 50.31     | 32.81    | 57.92    | 42.71      | 70.32                 |
| 12.    | Hingoli         | 5,69,182      | 48.34     | 43.69    | 54.58    | 41.73      | 82.24                 |
| 13.    | Jalgaon         | 18,63,571     | 44.06     | 38.86    | 54.00    | 33.31      | 70.91                 |
| 14.    | Jalna           | 8,44,492      | 47.52     | 43.11    | 53.88    | 40.72      | 77.34                 |
| 15.    | Kolhapur        | 17,04,054     | 43.96     | 38.92    | 56.81    | 30.54      | 54.39                 |
| 16.    | Latur           | 10,46,857     | 42.66     | 39.29    | 52.63    | 31.91      | 71.48                 |
| 17.    | Mumbai          | 12,84,396     | 41.63     | 39.2     | 60.61    | 18.8       | 0.92                  |
| 18.    | Mumbai suburban | 37,35,021     | 39.92     | 37.58    | 58.5     | 18.3       | 0.98                  |
| 19.    | Nagpur          | 18,68,560     | 40.15     | 35.56    | 55.94    | 23.55      | 33.73                 |
| 20.    | Nanded          | 14,93,953     | 44.45     | 39.2     | 53.48    | 34.86      | 72.31                 |
| 21.    | Nandurbar       | 7,92,065      | 48.05     | 40.3     | 53.16    | 42.84      | 82.04                 |
| 22.    | Nashik          | 27,63,328     | 45.25     | 41.31    | 55.31    | 34.48      | 61.44                 |
| 23.    | Osmanabad       | 773,916       | 46.69     | 42.34    | 54.99    | 37.70      | 77.12                 |
| 24.    | Parbhani        | 8,22,797      | 44.81     | 41.20    | 53.18    | 35.98      | 74.49                 |
| 25.    | Pune            | 40,48,993     | 42.94     | 39.78    | 57.06    | 27.50      | 32.14                 |
| 26.    | Raigarh         | 10,72,969     | 40.73     | 32.60    | 56.08    | 24.74      | 37.11                 |
| 27.    | Ratnagiri       | 7,14,076      | 44.21     | 34.36    | 53.47    | 35.96      | 63.02                 |
| 28.    | Sangli          | 12,15,104     | 43.06     | 38.09    | 55.74    | 29.93      | 63.47                 |
| 29.    | Satara          | 13,54,947     | 45.11     | 39.43    | 55.92    | 34.17      | 65.18                 |
| 30.    | Sindhudurg      | 3,47,178      | 40.86     | 26.66    | 55.03    | 27.18      | 59.52                 |
| 31.    | Solapur         | 18,98,395     | 43.97     | 40.84    | 54.17    | 33.09      | 62.98                 |
| 32.    | Thane           | 44,92,767     | 40.62     | 35.54    | 57.34    | 21.74      | 17.09                 |
| 33.    | Wardha          | 6,08,235      | 46.76     | 40.72    | 58.70    | 34.14      | 68.25                 |
| 34.    | Washim          | 5,69,792      | 47.60     | 42.00    | 54.87    | 39.77      | 83.5                  |
| 35.    | Yavatmal        | 13,55,999     | 48.91     | 43.11    | 57.43    | 39.97      | 79.14                 |

Source: Primary Census Abstract, 2011

**Table 81: District-wise Human Development Indicators**

| S. No. | District   | Human Development Index (HDI) |
|--------|------------|-------------------------------|
| 1.     | Nandurbar  | 0.604                         |
| 2.     | Gadchiroli | 0.608                         |
| 3.     | Washim     | 0.646                         |
| 4.     | Hingoli    | 0.648                         |
| 5.     | Osmanabad  | 0.649                         |
| 6.     | Nanded     | 0.657                         |
| 7.     | Jalna      | 0.663                         |
| 8.     | Latur      | 0.663                         |
| 9.     | Dhule      | 0.671                         |
| 10.    | Beed       | 0.678                         |
| 11.    | Parbhani   | 0.683                         |
| 12.    | Buldana    | 0.684                         |
| 13.    | Yavatmal   | 0.700                         |
| 14.    | Gondiya    | 0.701                         |
| 15.    | Amravati   | 0.701                         |
| 16.    | Bhandara   | 0.718                         |
| 17.    | Chandrapur | 0.718                         |
| 18.    | Ahmednagar | 0.720                         |
| 19.    | Akola      | 0.722                         |
| 20.    | Wardha     | 0.723                         |
| 21.    | Jalgaon    | 0.723                         |
| 22.    | Aurangabad | 0.727                         |
| 23.    | Solapur    | 0.728                         |
| 24.    | Ratnagiri  | 0.732                         |
| 25.    | Satara     | 0.742                         |
| 26.    | Sangli     | 0.742                         |
| 27.    | Nashik     | 0.746                         |
| 28.    | Sindhudurg | 0.753                         |
| 29.    | Raigarh    | 0.759                         |
| 30.    | Kolhapur   | 0.770                         |
| 31.    | Nagpur     | 0.786                         |
| 32.    | Thane      | 0.800                         |
| 33.    | Pune       | 0.814                         |
| 34.    | Mumbai     | 0.841                         |

Source: Maharashtra Human Development Report, 2011

**Table 82: District-wise Social Profile**

| S. No. | District | Female (percent to total population) | Sex ratio | Literacy rate (percent to total population) | Literacy rate female (percent to total female population) | Literacy rate male (percent to total male population) | SC population (percent to total population) | ST population (percent to total population) |
|--------|----------|--------------------------------------|-----------|---------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------|---------------------------------------------|---------------------------------------------|
| 1.     | Ahmdnagr | 48.4                                 | 939       | 79.05                                       | 70.89                                                     | 86.82                                                 | 12.63                                       | 8.33                                        |
| 2.     | Akola    | 48.6                                 | 946       | 88.05                                       | 83.54                                                     | 92.34                                                 | 20.07                                       | 5.53                                        |
| 3.     | Amravati | 48.7                                 | 951       | 87.4                                        | 83.1                                                      | 91.46                                                 | 17.5                                        | 14.0                                        |

| S. No | District        | Female ( percent to total population ) | Sex ratio | Literacy rate ( percent to total population ) | Literacy rate female ( percent to total female population ) | Literacy rate male ( percent to total male population ) | SC population ( percent to total population ) | ST population ( percent to total population ) |
|-------|-----------------|----------------------------------------|-----------|-----------------------------------------------|-------------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------|-----------------------------------------------|
| 4.    | Aurangbd        | 48.0                                   | 923       | 79.02                                         | 70.08                                                       | 87.37                                                   | 14.57                                         | 3.87                                          |
| 5.    | Bhandara        | 49.5                                   | 982       | 83.76                                         | 77.08                                                       | 90.35                                                   | 16.69                                         | 8.6                                           |
| 6.    | Beed            | 47.8                                   | 916       | 76.99                                         | 85.55                                                       | 67.82                                                   | 13.6                                          | 1.3                                           |
| 7.    | Buldana         | 48.3                                   | 934       | 83.4                                          | 75.84                                                       | 90.54                                                   | 18.2                                          | 5.2                                           |
| 8.    | Chandrpu r      | 49.0                                   | 961       | 80.01                                         | 72.97                                                       | 86.79                                                   | 15.8                                          | 17.67                                         |
| 9.    | Dhule           | 48.6                                   | 946       | 72.8                                          | 65.77                                                       | 79.5                                                    | 6.22                                          | 31.56                                         |
| 10.   | Gadchiroli      | 49.5                                   | 982       | 74.36                                         | 66.27                                                       | 82.31                                                   | 11.25                                         | 38.71                                         |
| 11.   | Gondiya         | 49.9                                   | 999       | 84.95                                         | 77.89                                                       | 92.04                                                   | 13.31                                         | 16.2                                          |
| 12.   | Hingoli         | 48.5                                   | 942       | 78.17                                         | 68.95                                                       | 86.94                                                   | 15.51                                         | 9.51                                          |
| 13.   | Jalgaon         | 48.0                                   | 925       | 78.2                                          | 70.56                                                       | 85.36                                                   | 9.2                                           | 14.29                                         |
| 14.   | Jalna           | 48.4                                   | 937       | 71.52                                         | 60.95                                                       | 81.53                                                   | 13.9                                          | 2.16                                          |
| 15.   | Kolhapur        | 48.9                                   | 957       | 81.51                                         | 74.22                                                       | 88.57                                                   | 13.01                                         | 12.8                                          |
| 16.   | Latur           | 48.1                                   | 928       | 77.26                                         | 69.63                                                       | 84.39                                                   | 19.6                                          | 2.34                                          |
| 17.   | Mumbai          | 45.4                                   | 832       | 89.21                                         | 86.5                                                        | 91.5                                                    | 7.1                                           | 5.5                                           |
| 18.   | Mumbai suburban | 46.2                                   | 860       | 89.91                                         | 86.4                                                        | 92.9                                                    | 6.2                                           | 1.1                                           |
| 19.   | Nagpur          | 48.8                                   | 951       | 88.39                                         | 84.51                                                       | 92.09                                                   | 18.65                                         | 9.4                                           |
| 20.   | Nanded          | 48.5                                   | 943       | 75.45                                         | 66.15                                                       | 84.27                                                   | 19.05                                         | 8.38                                          |
| 21.   | Nandurba r      | 49.5                                   | 978       | 64.38                                         | 56.47                                                       | 72.17                                                   | 2.91                                          | 69.28                                         |
| 22.   | Nashik          | 48.3                                   | 934       | 82.31                                         | 76.08                                                       | 88.17                                                   | 9.08                                          | 25.62                                         |
| 23.   | Osmanab a       | 48.0                                   | 924       | 78.44                                         | 70.51                                                       | 85.84                                                   | 16                                            | 2.17                                          |
| 24.   | Parbhani        | 48.6                                   | 947       | 73.34                                         | 63.63                                                       | 82.64                                                   | 13.47                                         | 2.21                                          |
| 25.   | Pune            | 47.8                                   | 915       | 86.15                                         | 81.05                                                       | 90.84                                                   | 12.52                                         | 3.7                                           |
| 26.   | Raigarh         | 48.9                                   | 959       | 83.14                                         | 76.92                                                       | 89.13                                                   | 5.12                                          | 11.58                                         |
| 27.   | Ratnagiri       | 47.1                                   | 1122      | 82.18                                         | 74.50                                                       | 90.90                                                   | 4.15                                          | 1.26                                          |
| 28.   | Sangli          | 49.1                                   | 966       | 81.48                                         | 74.59                                                       | 88.22                                                   | 12.51                                         | 0.65                                          |
| 29.   | Satara          | 49.7                                   | 988       | 82.87                                         | 76.31                                                       | 89.42                                                   | 10.76                                         | 0.99                                          |
| 30.   | Sindhudur       | 50.9                                   | 1036      | 85.56                                         | 79.81                                                       | 91.58                                                   | 6.54                                          | 0.82                                          |
| 31.   | Solapur         | 48.4                                   | 938       | 77.02                                         | 68.55                                                       | 85.03                                                   | 15.05                                         | 1.8                                           |
| 32.   | Thane           | 46.9                                   | 886       | 84.53                                         | 79.77                                                       | 88.72                                                   | 6.6                                           | 13.95                                         |
| 33.   | Wardha          | 48.6                                   | 946       | 86.99                                         | 81.81                                                       | 91.92                                                   | 14.5                                          | 11.5                                          |
| 34.   | Washim          | 48.2                                   | 930       | 83.25                                         | 75.48                                                       | 90.55                                                   | 19.17                                         | 6.72                                          |
| 35.   | Yavatmal        | 48.8                                   | 952       | 82.82                                         | 75.93                                                       | 89.41                                                   | 11.8                                          | 18.5                                          |

Source: Primary Census Abstract, 2011

Table 83: District-wise Demographic Profile

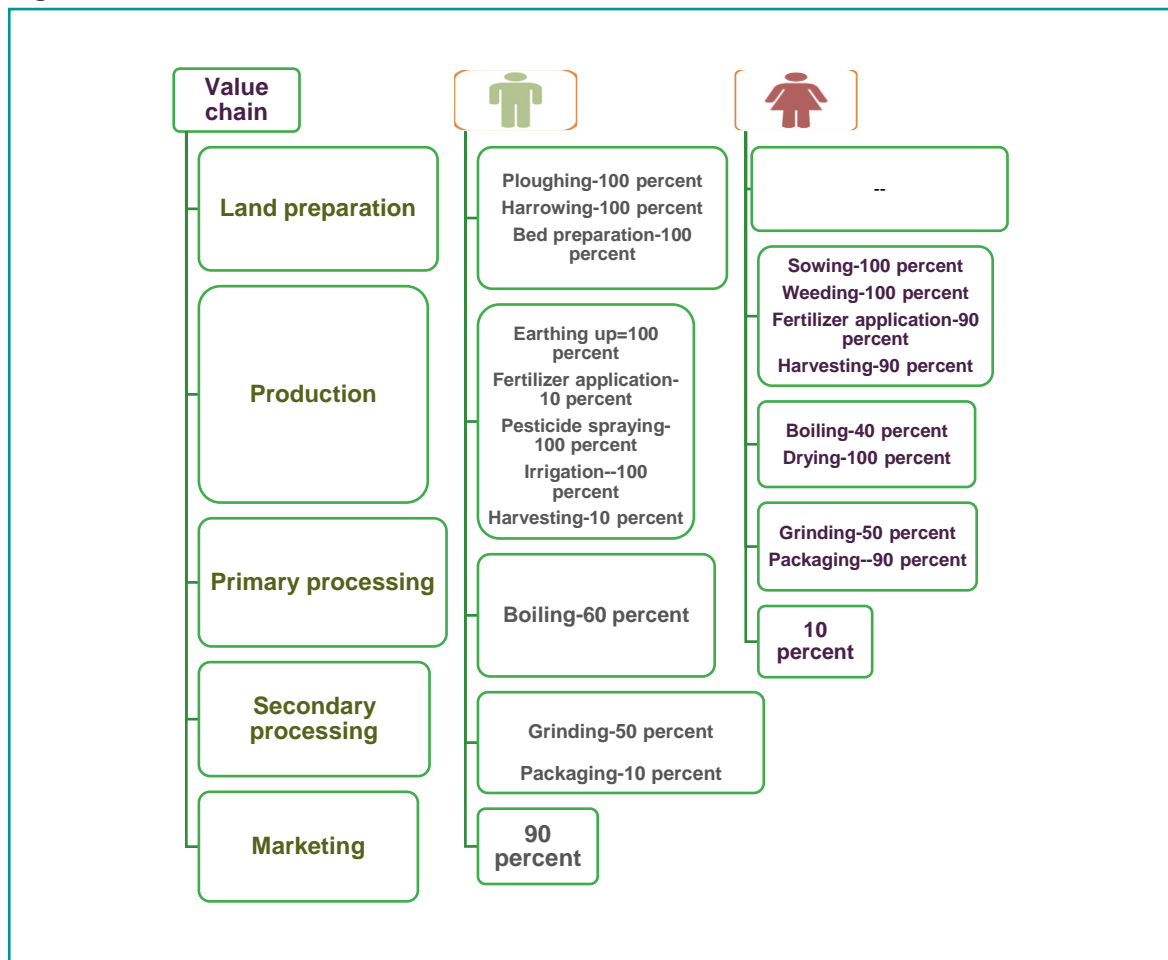
| S. No. | District        | Total Population (in crores) | percent to State population | Population density (persons / sq.km) | Household size | Rural population | Urban population | percent of urban population | percent of rural population |
|--------|-----------------|------------------------------|-----------------------------|--------------------------------------|----------------|------------------|------------------|-----------------------------|-----------------------------|
| 1.     | Ahmdnagr        | 45,43,159                    | 4.04                        | 266                                  | 4.9            | 36,30,542        | 9,12,617         | 20.08                       | 79.91                       |
| 2.     | Akola           | 18,13,906                    | 1.61                        | 320                                  | 4.6            | 10,94,165        | 719,741          | 39.67                       | 60.32                       |
| 3.     | Amravati        | 28,88,445                    | 2.57                        | 237                                  | 4.4            | 18,51,158        | 1,037,287        | 35.91                       | 64.08                       |
| 4.     | Aurangbd        | 37,01,282                    | 3.29                        | 365                                  | 4.9            | 20,81,112        | 1,620,170        | 43.77                       | 56.22                       |
| 5.     | Bhandara        | 12,00,334                    | 1.07                        | 294                                  | 4.3            | 9,66,503         | 2,33,831         | 19.48                       | 80.52                       |
| 6.     | Beed            | 25,85,049                    | 2.30                        | 242                                  | 4.8            | 20,70,751        | 5,14,298         | 19.89                       | 80.10                       |
| 7.     | Buldana         | 25,86,258                    | 2.3                         | 268                                  | 4.6            | 20,37,398        | 5,48,860         | 21.22                       | 78.78                       |
| 8.     | Chandrpur       | 22,04,307                    | 1.96                        | 193                                  | 4.1            | 14,28,929        | 7,75,378         | 35.18                       | 64.82                       |
| 9.     | Dhule           | 20,50,862                    | 1.83                        | 285                                  | 4.9            | 14,79,826        | 5,71,036         | 27.84                       | 72.16                       |
| 10.    | Gadchiroli      | 10,72,942                    | 0.95                        | 74                                   | 4.2            | 9,54,909         | 1,18,033         | 11.0                        | 88.9                        |
| 11.    | Gondiya         | 13,22,507                    | 1.18                        | 253                                  | 4.5            | 10,96,577        | 2,25,930         | 17.08                       | 82.92                       |
| 12.    | Hingoli         | 1,177,345                    | 1.05                        | 244                                  | 5.1            | 9,98,612         | 1,78,733         | 15.18                       | 84.82                       |
| 13.    | Jalgaon         | 42,29,917                    | 3.76                        | 360                                  | 4.7            | 28,87,206        | 13,42,711        | 31.74                       | 68.25                       |
| 14.    | Jalna           | 19,59,046                    | 1.74                        | 255                                  | 5.0            | 15,81,617        | 3,77,429         | 19.3                        | 80.7                        |
| 15.    | Kolhapur        | 38,76,001                    | 3.45                        | 504                                  | 4.6            | 26,45,992        | 12,30,009        | 31.73                       | 68.27                       |
| 16.    | Latur           | 24,54,196                    | 2.18                        | 343                                  | 5.1            | 18,29,216        | 6,24,980         | 24.5                        | 74.5                        |
| 17.    | Mumbai          | 30,85,411                    | 2.75                        | 19,652                               | 4.6            | -                | 30,85,411        | 100                         | -                           |
| 18.    | Mumbai suburban | 93,56,962                    | 8.33                        | 20,980                               | 4.4            | -                | 93,56,962        | 100                         | -                           |
| 19.    | Nagpur          | 46,53,570                    | 4.14                        | 470                                  | 4.4            | 14,74,811        | 31,78,749        | 68.31                       | 31.69                       |
| 20.    | Nanded          | 33,61,292                    | 2.99                        | 319                                  | 5.0            | 24,47,394        | 9,13,898         | 27.2                        | 72.8                        |
| 21.    | Nandurbar       | 16,48,295                    | 1.47                        | 277                                  | 4.9            | 13,72,821        | 275,474          | 16.71                       | 83.29                       |
| 22.    | Nashik          | 61,07,187                    | 5.43                        | 393                                  | 4.9            | 35,09,814        | 25,97,373        | 42.5                        | 57.5                        |
| 23.    | Osmanaba        | 16,57,576                    | 1.48                        | 219                                  | 4.7            | 13,76,519        | 2,81,057         | 17.0                        | 83.0                        |
| 24.    | Parbhani        | 18,36,086                    | 1.63                        | 295                                  | 5.1            | 12,66,280        | 5,69,806         | 31.03                       | 68.97                       |
| 25.    | Pune            | 94,29,408                    | 8.39                        | 603                                  | 4.4            | 36,78,226        | 57,51,182        | 39.0                        | 60.99                       |
| 26.    | Raigarh         | 26,34,200                    | 2.34                        | 368                                  | 4.3            | 16,64,005        | 9,70,195         | 36.83                       | 63.17                       |
| 27.    | Ratnagiri       | 16,15,069                    | 1.44                        | 197                                  | 4.1            | 13,51,346        | 2,63,723         | 16.33                       | 83.67                       |
| 28.    | Sangli          | 28,22,143                    | 2.51                        | 329                                  | 4.7            | 21,02,786        | 7,19,357         | 25.49                       | 74.51                       |
| 29.    | Satara          | 30,03,741                    | 2.67                        | 287                                  | 4.6            | 24,33,363        | 5,70,378         | 18.99                       | 81.01                       |
| 30.    | Sindhudur       | 8,49,651                     | 0.76                        | 163                                  | 4.0            | 7,42,645         | 1,07,006         | 12.59                       | 87.41                       |
| 31.    | Solapur         | 43,17,756                    | 3.84                        | 290                                  | 4.9            | 29,18,665        | 13,99,091        | 32.40                       | 67.60                       |
| 32.    | Thane           | 1,10,60,148                  | 9.84                        | 1157                                 | 4.4            | 25,45,470        | 85,14,678        | 76.99                       | 23.01                       |
| 33.    | Wardha          | 13,00,774                    | 1.16                        | 206                                  | 4.2            | 8,77,474         | 4,23,300         | 32.5                        | 67.5                        |
| 34.    | Washim          | 11,97,160                    | 1.07                        | 244                                  | 4.6            | 9,85,747         | 2,11,413         | 17.7                        | 82.3                        |
| 35.    | Yavatmal        | 27,72,348                    | 2.47                        | 204                                  | 4.3            | 21,74,195        | 5,98,153         | 21.58                       | 78.42                       |

Source: Primary Census Abstract, 2011

## E. Gender Analysis of Value Chain

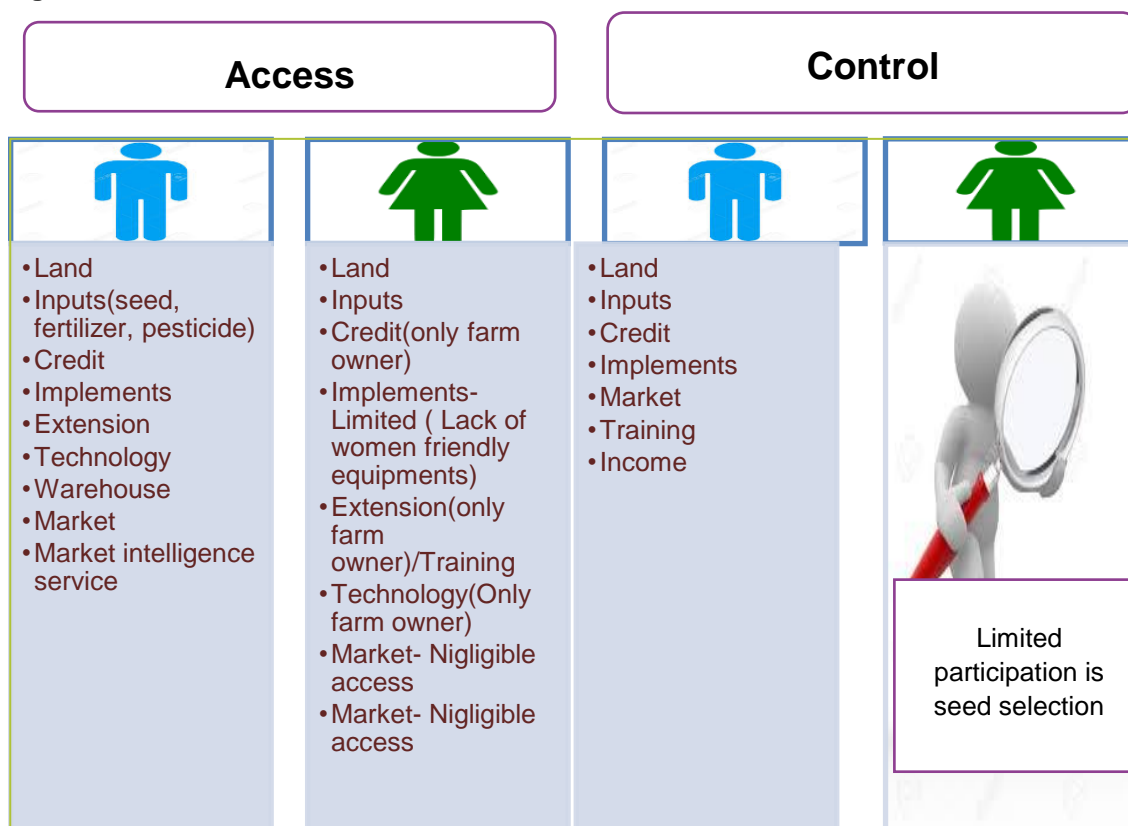
### E.1 Gender Division of Labour for Turmeric

Figure 23: Gender Division



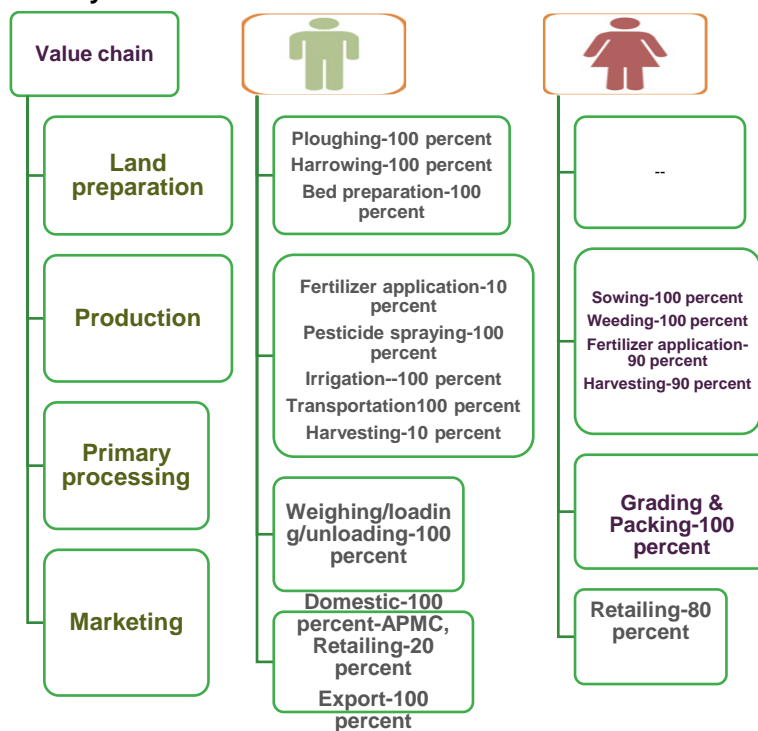
### E.1.1 Access and Control Over Resources

Figure 24: Access and Control Over Resources








## E.2 Gender Analysis of Okra Value Chain Based on Division of Labour

Figure 25: Gender Analysis Okra Value Chain



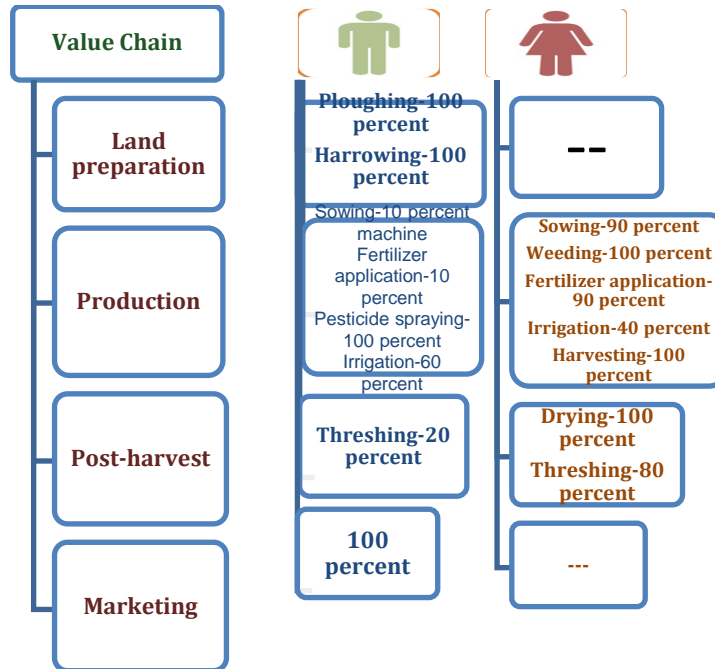
## E.2.1 Access and Control Over Resource

Figure 26: Access and Control Over Resource - Soybean

| Access                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                         | Control/Decision making                                                                                                                                             |                                                                                                                                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                          |                                                                                                                                                                                                                                                                                        |                                                                                    |                                                 |
| <ul style="list-style-type: none"> <li>•Land</li> <li>•Inputs(seed, fertilizer, pesticide)</li> <li>•Credit</li> <li>•Implements</li> <li>•Extension</li> <li>•Technology</li> <li>•Warehouse</li> <li>•Market</li> </ul> | <ul style="list-style-type: none"> <li>•Land</li> <li>•Inputs</li> <li>•Credit(only farm owner)</li> <li>•Implements-Limited (Lack of women friendly equipments)</li> <li>•Extension(only farm owner)/Training</li> <li>•Technology(Only farm owner)</li> <li>•Warehouse</li> <li>•Market- Nigligible access</li> <li>•Market intelligence Nigligible access</li> </ul> | <ul style="list-style-type: none"> <li>•Land</li> <li>•Inputs</li> <li>•Credit</li> <li>•Implements</li> <li>•Market</li> <li>•Training</li> <li>•Income</li> </ul> |  <p>Limited participation in seed selection</p> |






### E.3 Gender Analysis of Soybean Value Chain Based on Division of Labour

Figure 27: Gender Analysis of Soybean Value Chain Based on Division of Labour



### E.3.1 Access and Control

Figure 28: Access and Control - Soybean

| Access                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                         | Control                                                                                                                                                                    |                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|                                                                                                                                                  |                                                                                                                                                                                                                                                                                                        |                                                                                           |   |
| <ul style="list-style-type: none"> <li>• Land</li> <li>• Inputs(seed, fertilizer, pesticide)</li> <li>• Credit</li> <li>• Implements</li> <li>• Extension</li> <li>• Technology</li> <li>• Warehouse</li> <li>• Market</li> </ul> | <ul style="list-style-type: none"> <li>• Land</li> <li>• Inputs</li> <li>• Credit(only farm owner)</li> <li>• Implements-Limited (Lack of women friendly equipments)</li> <li>• Extension(only farm owner)/Training</li> <li>• Technology(Only farm owner)</li> <li>• Warehouse (only farm)</li> <li>• Market- Nigligible access</li> <li>• Market intelligence - Nigligible</li> </ul> | <ul style="list-style-type: none"> <li>• Land</li> <li>• Inputs</li> <li>• Credit</li> <li>• Implements</li> <li>• Market</li> <li>• Training</li> <li>• Income</li> </ul> |  |

## F. Detailed Environmental Baseline

### F.1 Topography

Maharashtra is in the north centre of Peninsular India and is spread over a geographic area of 3,07,713 sq.km. The state is located between 15° 45' N to 22° 06' N latitude and 72° 36'E to 80° 54' E longitude<sup>29</sup>.

Maharashtra topography comprises of the Western Ghat or the Sahyadri hills and the deccan plateau. The Sahyadri range forms the backbone of Maharashtra and is a very important part of physiology of the state as it blocks the monsoon bearing winds and causes rainfall in the eastern part. The ranges form the most important drainage basin of the river system of western and central India. The altitude of the ranges is higher in the northern part of the state namely Mahabaleshwar at 1438 m.

The main hills and ranges of the region include Satpura ranges, Tamhini Varandha and Sawantwadi Ghats which are the divisions of the Western Ghats.



*Sahyadri Ranges Maharashtra  
Maharashtra Tourism Govt. of Maharashtra*

The Konkan region is situated between the Arabian sea and the Sahyadri range and is mainly low-lying area. The region is very unruly, steep at some places and valley in some places.

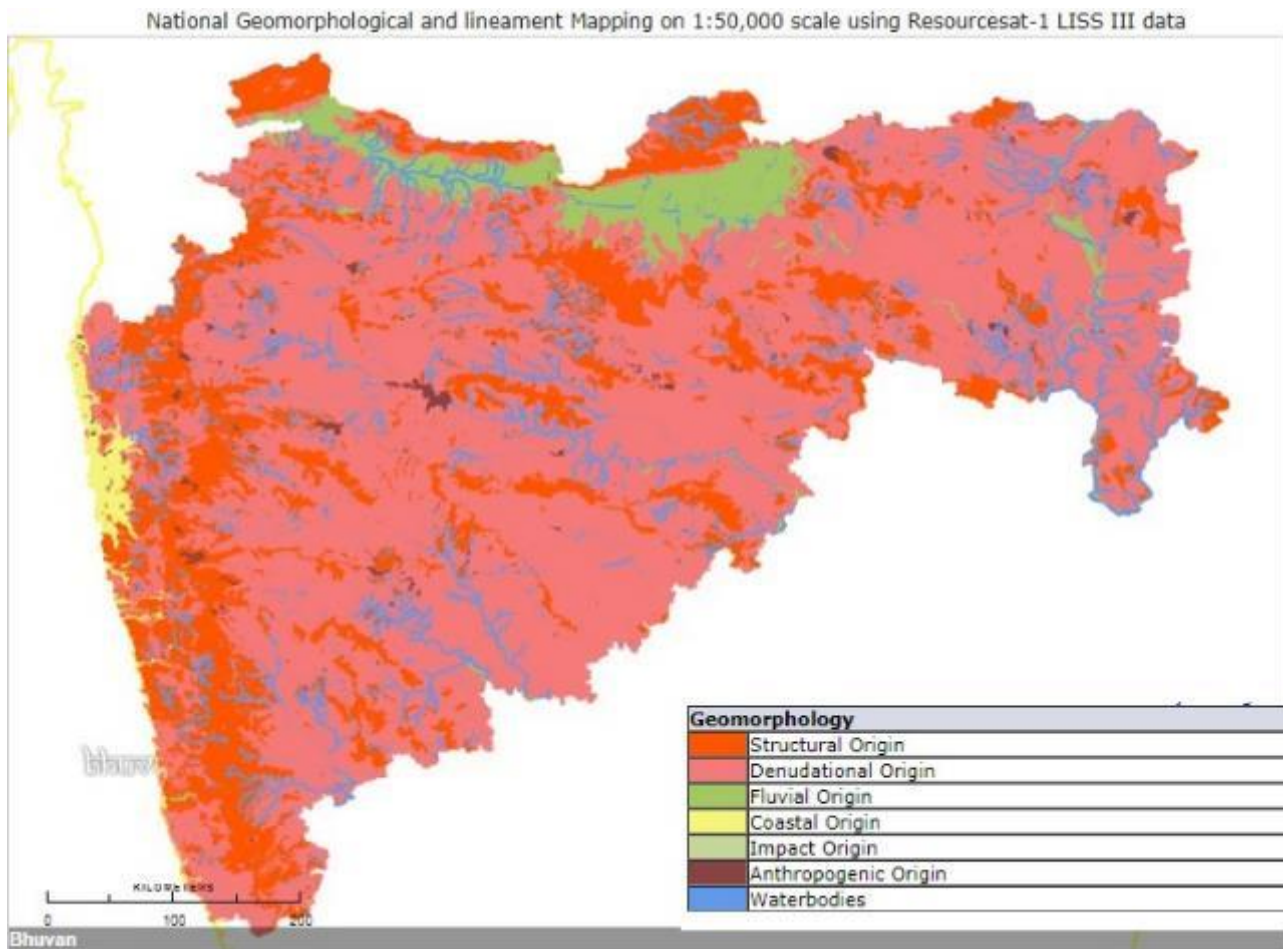
The main rivers of the state are river Krishna, Bhima, Godavari, Tapi, Purna and the WardHa

Deccan Plateau covers most of the peninsular part of India and is boarded by the Western Ghats and the Eastern Ghats in the west and the east respectively. Major cities of Maharashtra in the Deccan region are Pune Nagpur and Solapur. Most of the northern part of the Deccan is in Maharashtra. The rocks in the region are mainly basalt and granite. The altitude of the plateau ranges between 450 – 750m.

The topographic map of Maharashtra is as indicated in the Figure below.

<sup>29</sup> Dr Shelar S K and Dr Madhuri S K; Conservation Strategies of Biodiversity in Maharashtra, India, International Journal of Applied Research 2016; 2(4); 713 -716

**Figure 29: Map Showing Maharashtra Geomorphology**



Source: MRSAC

## F.2 Geology and Soil Type

Maharashtra geology comprises of deccan trap, alluvial deposit, Proterozic rock, Gondwana system and Lameta and Bagh Beds.

Deccan trap occupies 82 percent of the area and is composed of thick pile of lava flow. Alluvial deposits occur along the lower reaches of major river valleys including the Purna valley in the districts of Akola, Amravati, and Buldhana. Proterozic rock consist of limestone, dolomitic limestone, shale and feldspathic sandstone and is prominent in the districts of Nanded and Yavatmal. The upper Gondwana sediments are exposed around Bairamghat in Amravati district and it essentially consist of sandstone, shale and clays. The Lameta and Bagh beds occur below the deccan plateau and comprises of calcareous sandstones, cherty limestone and clays.

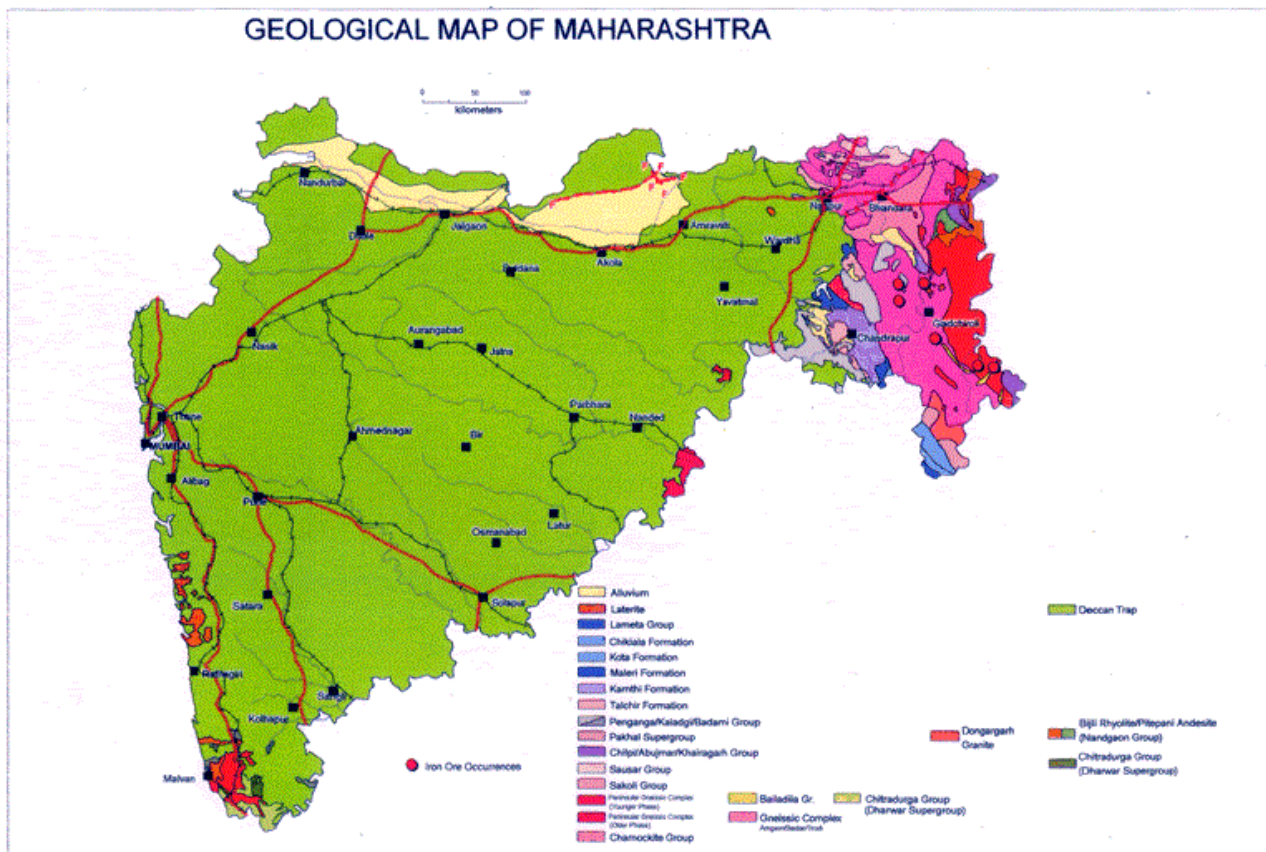
Maharashtra is commonly known for its black cotton soil. The fertile black cotton soil popularly known as regur is confined to only valley plains. Most soil has been developed from basalt, it is the topographic situation and the climatic characteristics that has a major impact on soil formation.

The major soils of Maharashtra are classified in the following types<sup>30</sup>:

- Light black course shallow soil occurring in the central high elevation,
- Medium Black Soil occurring in the central Plateaus,
- Deep Black soil occurring in the central river valleys,
- Reddish brown soil occurring in western hill slopes,
- Alluvial soil occurring in the western coastal area,
- Yellowish Brown soil of mixed origin occurring in high elevation in the east,
- Yellowish brown soil occurring in eastern plateau,
- Laterite soil occurring in western coastal area and
- Saline soils occurring in the western Konkan region.

District wise geology and soil type is as indicated in Table 84. The map showing geology and soil type in Maharashtra are as indicated in the figure below.

**Figure 30: Map Showing Maharashtra Geology / Soil type**

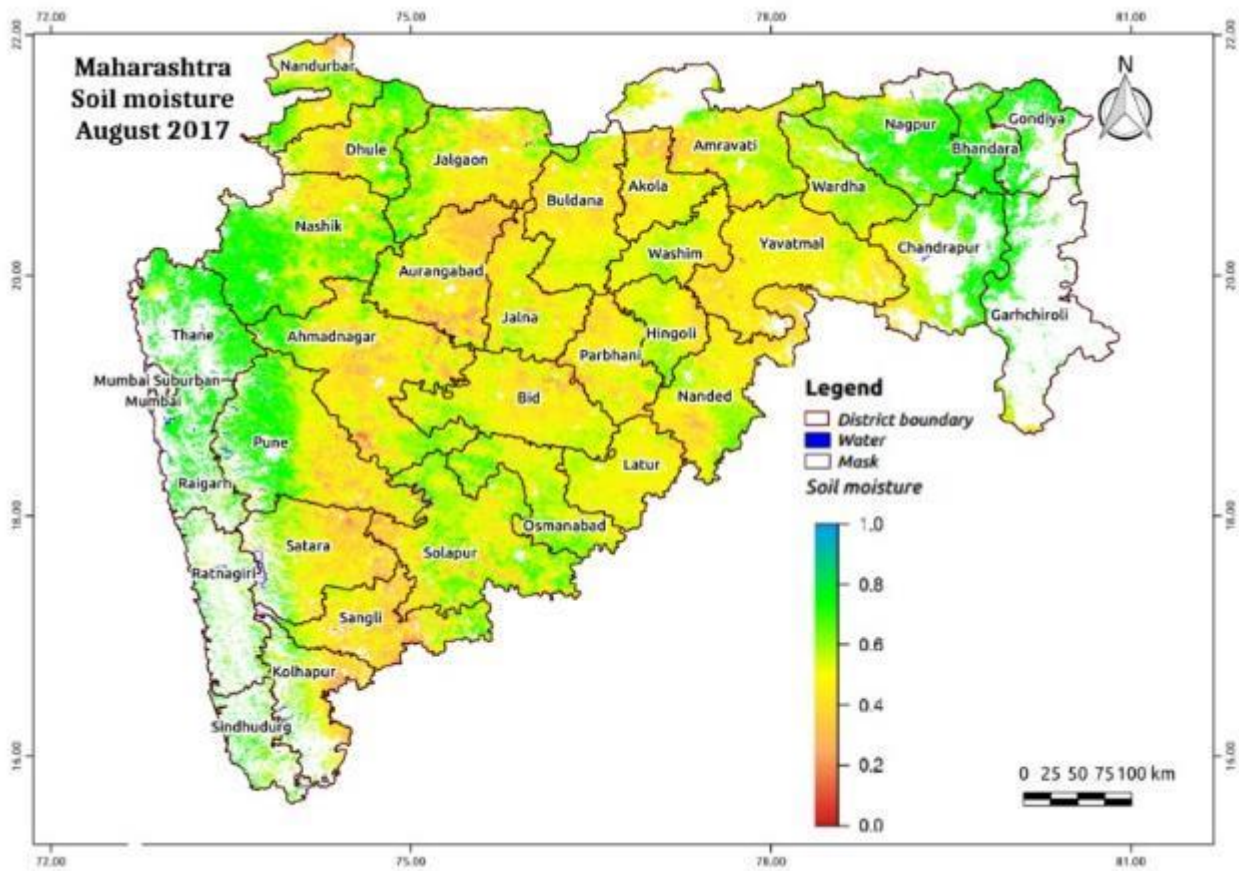


Source:

District wise soil moisture content map of Maharashtra is as indicated in the Figure below.

<sup>3030</sup> Maharashtra Water Sector Improvement Project, Department of Agriculture, Maharashtra State.

Figure 31: District Wise Soil Moisture Content Map of Maharashtra

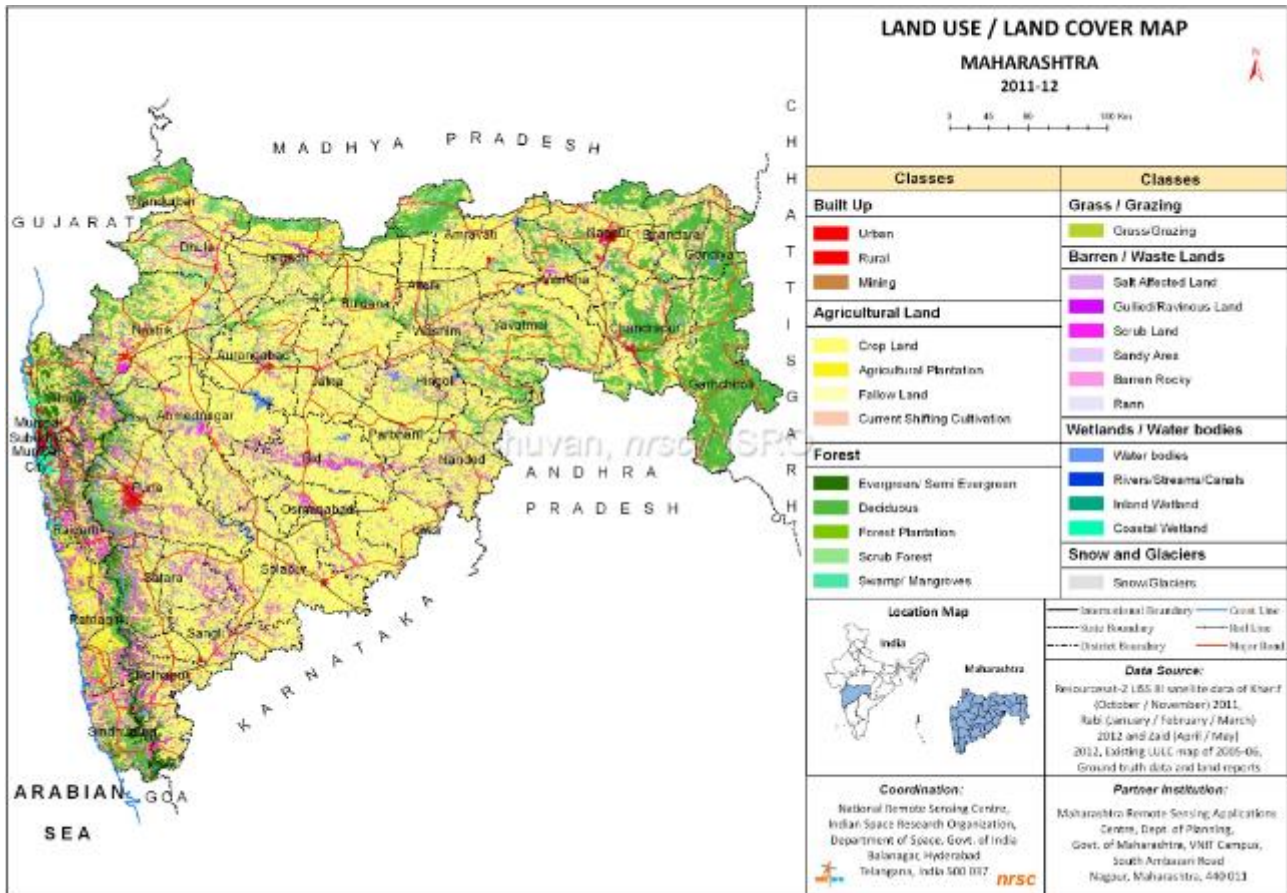


Source:

### F.3 Maharashtra Land-use Plan

Maharashtra Land-use map is as indicated in the Figure below.

Figure 32: Land-use Map of Maharashtra



Source: National Natural Resource Management System ISRO 2014

#### F.4 District wise irrigation

Table 84: District Wise Agricultural Statistics

| S. No. | District   | Agro Climatic Zone                           | Geographical Area | Geology                               | Soil Type                                                                                                          | Rainfall  | Agricultural Land-use                                                           | All units in '000 Ha                                                                                                        |                    |              |
|--------|------------|----------------------------------------------|-------------------|---------------------------------------|--------------------------------------------------------------------------------------------------------------------|-----------|---------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|--------------------|--------------|
|        |            |                                              |                   |                                       |                                                                                                                    |           |                                                                                 | Irrigation                                                                                                                  | Cropping Intensity | Forest Cover |
| 1      | Thane      | North Konkan Coastal Zone                    | 934               | Alluvium Deccan Trap Basalt           | The major soil types are:<br>Shallow red soil: 708.4<br>Medium deep red soil: 221.9<br>Deep Soil: 3.6              | 2597.5 mm | Net Sown area: 356<br>Area sown more than once 36<br>Gross cropped area 392     | Net Irrigated area: 19.2<br>Gross Irrigated area: 21.3<br>Rainfed Area: 336.8<br>Canal, open, bore well and lift irrigation | 110 percent        | 330          |
| 2      | Raigarh    | North Konkan Coastal Zone                    | 687               | Alluvium and Laterite Gondwana        | The major soil types are:<br>Shallow soil: 453.8<br>Medium deep soil: 233.4<br>Deep Soil: 0.2                      | 3200.9 mm | Net Sown area 203<br>Area sown more than once 30<br>Gross cropped area 233      | Net Irrigated area: 14.9<br>Gross Irrigated area: 17.4<br>Rainfed Area: 188.1<br>Canal and open well                        | 114 percent        | 149          |
| 3      | Ratnagiri  | South Konkan Coastal Zone                    | 816               | Alluvium, beach sand, laterite, shale | The major soil types are:<br>Deep soil: 64.3<br>Medium deep soil: 234<br>Shallow Soil: 517.6                       | 3591.3 mm | Net Sown area 303<br>Area sown more than once 35<br>Gross cropped area 338      | Net Irrigated area: 9.4<br>Gross Irrigated area: 10.4<br>Rainfed Area: 293.6<br>Canal, open well and micro irrigation       | 112 percent        | 6            |
| 4      | Sindhudurg | South Konkan Coastal Zone                    | 504               | Alluvium, beach sand, laterite, shale | The major soil types are:<br>Deep Soil: 57.17<br>Medium Deep soil: 192.28<br>Shallow Soil: 254.53                  | 3598.8 mm | Net Sown area 163<br>Area sown more than once 4<br>Gross cropped area 167       | Net Irrigated area: 17<br>Gross Irrigated area: 20<br>Rainfed Area: 127<br>Open well, bore well and lift irrigation scheme  | 102 percent        | 39           |
| 5      | Satara     | Western Maharashtra Scarcity Zone            | 1058.2            | Alluvium Deccan Trap Basalt           | The major Soil type are:<br>Shallow grey / black soil: 517.2<br>Deep black soil: 147.9<br>Medium lack soil: 134.3  | 768 mm    | Net Sown area 580.4<br>Area sown more than once 219<br>Gross cropped area 799.4 | Net Irrigated area: 94.6<br>Gross Irrigated area: 283.0<br>Rainfed Area: 421.7<br>Canal, open well and lift irrigation      | 128 percent        | 13.5         |
| 6      | Pune       | Western Maharashtra Plain Zone Scarcity Zone | 1562              | Alluvium Deccan Trap Basalt           | The major soil type is:<br>Shallow red grey soil: 571.1<br>Deep black soil: 200.5<br>Medium Deep black soil: 173.3 | 744.9 mm  | Net Sown area 945<br>Area sown more than once: 203<br>Gross cropped area 1148   | Net Irrigated area: 287<br>Gross Irrigated area: 313<br>Rainfed Area: 835<br>Canal, tank, open well and lift irrigation     | 121 percent        | 165.1        |

| S. No. | District   | Agro Climatic Zone                                                          | Geographical Area | Geology                                        | Soil Type                                                                                                                 | Rainfall     | Agricultural Land-use                                                                    | Irrigation                                                                                                                                     | Cropping Intensity | Forest Cover |
|--------|------------|-----------------------------------------------------------------------------|-------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|--------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------|
| 7      | Kolhapur   | Sub Mountain Zone                                                           | 776.3             | Alluvium<br>Deccan Trap<br>Basalt              | The major soil types are:<br>Shallow laterite soil: 172.4<br>Deep brownish soil 151.5<br>Medium deep black soil:<br>102.9 | 1019.5<br>mm | Net Sown area 414.4<br>Area sown more than<br>once 318.8<br>Gross cropped area<br>733.2  | Net Irrigated area: 128<br>Gross Irrigated area: 135<br>Rainfed Area: 298.9<br>Tank, open well bore well,<br>lift irrigation                   | 177<br>percent     | 147.2        |
| 8      | Nashik     | Western<br>Ghat<br>Western<br>Maharashtra<br>Plain Zone<br>Scarcity<br>Zone | 1536.4            | Alluvium<br>Deccan Trap<br>Basalt              | The major soil types are:<br>Shallow red soil: 536.7<br>Medium red/black soil: 170.3<br>Deep black soil: 101.9            | 1076 mm      | Net Sown area 742.4<br>Area sown more than<br>once 56.1<br>Gross cropped area<br>798.5   | Net Irrigated area: 193<br>Gross Irrigated area:<br>407.4<br>Rainfed Area: 549<br>Canal, tank, open, bore<br>well and lift irrigation          | 108<br>percent     | 320.6        |
| 9      | Nandurbar  | Western<br>Maharashtra<br>Plain Zone                                        | 503               | Alluvium<br>Deccan Trap<br>Basalt<br>Bagh Beds | The major soil types are:<br>Shallow black soil: 118.8<br>Medium deep black soil:<br>103.9<br>Deep black soil: 74.2       | 872 mm       | Net Sown area 297<br>Area sown more than<br>once 100.0<br>Gross cropped area 397         | Net Irrigated area: 66<br>Gross Irrigated area: 91<br>Rainfed Area: 231<br>Open well and bore well<br>irrigation                               | 134<br>percent     | 105          |
| 10     | Dhule      | Scarcity<br>zone                                                            | 824.6             | Alluvium<br>Deccan Trap<br>Basalt<br>Bagh Beds | The major soil types are:<br>Shallow black soil: 278<br>Medium deep black soil:<br>111.0<br>Deep black soil: 75.8         | 728.5 mm     | Net Sown area 431<br>Area sown more than<br>once 19<br>Gross cropped area 464            | Net Irrigated area: 87.1<br>Gross Irrigated area:<br>117.1<br>Rainfed Area: 377.6<br>Canal, open well and<br>bore well irrigation              | 108<br>percent     | 208.8        |
| 11     | Ahmednagar | Western<br>Maharashtra<br>Scarcity<br>Zone                                  | 1511.78           | Alluvium<br>Deccan Trap<br>Basalt              | The major Soil type are:<br>Shallow Grey Soil: 389.4<br>Medium deep black soil: 142<br>Deep black soil: 63.4              | 531 mm       | Net Sown area 645<br>Area sown more than<br>once 130.4<br>Gross cropped area<br>784.4    | Net Irrigated area:170.57<br>Gross Irrigated area:<br>131.45<br>Rainfed area: 108.67<br>Percentage: 20 percent<br>Tank, open well, borewell    | 105<br>percent     | 121          |
| 12     | Solapur    | Scarcity<br>Zone                                                            | 1487.8            | Alluvium<br>Deccan Trap<br>Basalt              | The major soil types are:<br>Shallow black soil: 699<br>Deep black soil: 188.1<br>Medium black soil: 143.7                | 723.4 mm     | Net Sown area 919.7<br>Area sown more than<br>once 102.8<br>Gross cropped area<br>1022.5 | Net Irrigated area: 251.5<br>Gross Irrigated area: 271<br>Rainfed Area: 759.9<br>Canal, tank, open, bore<br>well and lift irrigation<br>scheme | 111<br>percent     | 35.3         |

| S. No. | District   | Agro Climatic Zone                                                          | Geographical Area | Geology                                                   | Soil Type                                                                                                              | Rainfall  | Agricultural Land-use                                                              | Irrigation                                                                                                                                        | Cropping Intensity | Forest Cover |
|--------|------------|-----------------------------------------------------------------------------|-------------------|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------|
| 13     | Sangli     | Scarcity Zone<br>Western Maharashtra<br>Plain Zone                          | 861               | Alluvium<br>Deccan Trap<br>Basalt                         | The major soil types are:<br>Shallow black / red soil: 389.4<br>Deep black soil: 142.7<br>Medium deep black soil: 63.4 | 692.4 mm  | Net Sown area 557.1<br>Area sown more than once 91.9<br>Gross cropped area 649     | Net Irrigated area: 174<br>Gross Irrigated area: 190<br>Rainfed Area: 421.6<br>Canal, tank, open, bore well, lift and micro irrigation            | 117 percent        | 45.1         |
| 14     | Jalgaon    | Central Maharashtra<br>Plateau Zone                                         | 1163.9            | Alluvium<br>Deccan Trap<br>Basalt                         | The major soil types are:<br>Shallow black soil 415.61<br>Medium Deep black soil 136<br>Deep black soil 85.16          | 750 mm    | Net Sown area 844.2<br>Area sown more than once 480.6<br>Gross cropped area 1324.8 | Net Irrigated area: 213<br>Gross Irrigated area: 295<br>Rainfed Area: 717<br>Canal, open well, bore well and lift irrigation                      | 156 percent        | 155.9        |
| 15     | Aurangabad | Western Maharashtra<br>Scarcity Zone<br>Central Maharashtra<br>Plateau Zone | 1007.7            | Alluvium<br>Deccan Trap<br>Basalt                         | The major soil type is:<br>Deep black soil 200.61<br>Medium deep black soil 209.37<br>Shallow black soil 597.39        | 734.3 mm  | Net Sown area 654<br>Area sown more than once 130.4<br>Gross cropped area 784.4    | Net Irrigated area: 163.3<br>Gross Irrigated area: 200.2<br>Rainfed area: 490.7<br>Percentage: 20 percent<br>open well, bore well lift irrigation | 120 percent        | 72.6         |
| 16     | Buldana    | Central Maharashtra<br>Plateau Zone                                         | 967               | Alluvium<br>Deccan Trap<br>Basalt                         | The major soil type is:<br>Deep black soil 342.0<br>Medium Deep black soil 80.6<br>Shallow black soil 544.3            | 792.5 mm  | Net Sown area 712<br>Area sown more than once 44<br>Gross cropped area 756         | Net Irrigated area: 43.45<br>Gross Irrigated area: 46.56<br>Rainfed Area: 704.12<br>Canal irrigation                                              | 106 percent        | 54           |
| 17     | Jalna      | Central Maharashtra<br>Plateau Zone                                         | 772.6             | Alluvium<br>Deccan Trap<br>Basalt                         | The major soil types are:<br>Shallow black soil 349.1<br>Medium Deep black soil 289.8<br>Deep black soil 213.5         | 750.4 mm  | Net Sown area 529<br>Area sown more than once 159<br>Gross cropped area 688        | Net Irrigated area: 116.48<br>Gross Irrigated area: 124.03<br>Rainfed Area: 412.52<br>Canal Tank and open well irrigation                         | 130 percent        | 4.9          |
| 18     | Beed       | Western Maharashtra<br>Scarcity Zone<br>Central Maharashtra<br>Plateau Zone | 1068.6            | Rocky and thin layer soil except on the banks of Godavari | The Major soil type are:<br>Deep Black Soil 332.21<br>Medium Deep Black Soil 130.66<br>Shallow black soil 661.96       | 674.77 mm | Net Sown area 876<br>Area sown more than once 175.2<br>Gross cropped area 1051.2   | Net Irrigated area: 137.7<br>Gross Irrigated area: 169<br>Rainfed area: 738.3<br>Percentage: 16 percent<br>open well irrigation                   | 109 percent        | 22.9         |

| S. No. | District  | Agro Climatic Zone                             | Geographical Area | Geology                                         | Soil Type                                                                                                         | Rainfall | Agricultural Land-use                                                                | Irrigation                                                                                                                                    | Cropping Intensity | Forest Cover |
|--------|-----------|------------------------------------------------|-------------------|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|----------|--------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------|
| 19     | Osmanabad | Central Maharashtra Plateau Zone Scarcity Zone | 748.5             | Deccan Trap Basalt                              | The major soil types are:<br>Deep black soil 171.69<br>Medium Deep black soil 79.54<br>Shallow soil 490.81        | 842.4 mm | Net Sown area 519.31<br>Area sown more than once 321.88<br>Gross cropped area 841.19 | Net Irrigated area: 106.65<br>Gross Irrigated area: 128.37<br>Rainfed Area: 412.6<br>Canal, tank, open, and bore well                         | 161 percent        | 4.4          |
| 20     | Latur     | Central Maharashtra Plateau Zone               | 715.7             | Alluvium Deccan Trap Basalt                     | The major soil types are:<br>Deep black soil 253.67<br>Medium deep black soil 105.80<br>Shallow black soil 351.10 | 769.7 mm | Net Sown area 529<br>Area sown more than once 159<br>Gross cropped area 688          | Net Irrigated area: 319<br>Gross Irrigated area: 349<br>Rainfed Area: 249<br>Canal and Open well irrigation                                   | 130 percent        | 1.8          |
| 21     | Parbhani  | Central Maharashtra Plateau Zone               | 631.1             | Alluvium Deccan Trap Basalt                     | The major soil types are:<br>Deep black soil 413.12<br>Medium deep soil 32.77<br>Shallow soil 322.15              | 957.6 mm | Net Sown area 518.78<br>Area sown more than once 103.75<br>Gross cropped area 622.53 | Net Irrigated area: 131.77<br>Gross Irrigated area: 182.269<br>Rainfed Area: 387.01<br>Canal, tank, open well irrigation                      | 120 percent        | 6.4          |
| 22     | Akola     | Central Maharashtra Plateau Zone               | 540               | Alluvium Deccan Trap Basalt                     | Deep Black Soil 251.34<br>Medium Deep Black Soil 53.50<br>Shallow Black Soil 235.15                               | 825.3 mm | Net Sown area 434.9<br>Area sown more than once 91.1<br>Gross cropped area 526       | Net Irrigated area: 24.51<br>Gross Irrigated area: 42.82<br>Rainfed area: 441.6<br>Open and canal irrigation                                  | 121 percent        | 35           |
| 23     | Amravati  | Central Maharashtra Plateau Zone               | 1304              | Alluvium Basalt Lameta Bed Gondwana Metamorphic | The major Soil type are:<br>Deep Black Soil 653.7<br>Medium Deep Black Soil 13.1<br>Shallow Black Soil 501.2      | 886.4 mm | Net Sown area 602<br>Area sown more than once 110<br>Gross cropped area 712          | Net Irrigated area: 51.3<br>Gross Irrigated area: 63.8<br>Rainfed area: 540.7<br>Percentage: 8.8 percent open well, bore well lift irrigation | 118 percent        | 8.8          |
| 24     | Washim    | Central Vidarbha zone                          | 514               | Alluvium Deccan Trap Basalt                     | The major soil types are:<br>Deep black soil 239.2<br>Medium Deep black soil 50.9<br>Shallow black soil 223.8     | 965.3 mm | Net Sown area 386<br>Area sown more than once 38<br>Gross cropped area 424           | Net Irrigated area: 31.58<br>Gross Irrigated area: 41.81<br>Rainfed Area: 399.71<br>Canal, tank, open, bore well, lift and micro irrigation   | 110 percent        | 35           |

| S. No. | District | Agro Climatic Zone                                        | Geographical Area | Geology                                                                       | Soil Type                                                                                                               | Rainfall  | Agricultural Land-use                                                             | Irrigation                                                                                                                                  | Cropping Intensity | Forest Cover |
|--------|----------|-----------------------------------------------------------|-------------------|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|-----------|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------|
| 25     | Hingoli  | Central Maharashtra Plateau Zone<br>Central Vidarbha zone | 466.1             | Alluvium<br>Deccan Trap<br>Basalt                                             | The major soil types are:<br>Deep black cotton soil 186.40<br>Medium deep black soil 40.77<br>Shallow black soil 285.81 | 946.6 mm  | Net Sown area 382.1<br>Area sown more than once 120.4<br>Gross cropped area 502.5 | Net Irrigated area: 88.9<br>Gross Irrigated area: 204.3<br>Rainfed Area: 293.2<br>Canal, tank, open well, bore well and lift irrigation     | 132 percent        | 28.4         |
| 26     | Nanded   | Central Maharashtra Plateau Zone<br>Central Vidarbha Zone | 1033.1            | Alluvium<br>Basalt<br>Vindhyan<br>Peninsular granite<br>Pink and Grey Granite | The major soil types are:<br>Deep black soil 394.65<br>Medium deep black soil 101.12<br>Shallow black soil 576.26       | 993.1 mm  | Net Sown area 711<br>Area sown more than once 100.1<br>Gross cropped area 811.1   | Net Irrigated area: 112<br>Gross Irrigated area: 125.64<br>Rainfed Area: NA<br>Canal, tank, open wells, bore well and lift irrigation       | 114 percent        | 85.3         |
| 27     | Yavatmal | Central Vidarbha Zone                                     | 1352              | Alluvium<br>Deccan Trap<br>Basalt                                             | The major soil types are:<br>Deep black soil 469.4<br>Medium Deep black soil 176.1<br>Shallow black soil 706.4          | 886.4 mm  | Net Sown area 884<br>Area sown more than once 15<br>Gross cropped area 899        | Net Irrigated area: 35.4<br>Gross Irrigated area: 39<br>Rainfed Area: 839.3<br>Canal and open well irrigation                               | 102 percent        | 243          |
| 28     | Wardha   | Central Vidarbha Zone                                     | 629               | Alluvium<br>Deccan Trap<br>Basalt                                             | The major soil types are:<br>Deep black soil 245.1<br>Medium deep black soil 102.9<br>Shallow black soil 280.9          | 886.4 mm  | Net Sown area 284<br>Area sown more than once 158<br>Gross cropped area 442       | Net Irrigated area: 31.58<br>Gross Irrigated area: 41.81<br>Rainfed Area: 399.71<br>Canal, tank, open, bore well, lift and micro irrigation | 156 percent        | 77           |
| 29     | Nagpur   | Eastern Vidarbha Zone<br>Central Vidarbha Zone            | 986               | Alluvium<br>Basalt<br>Lameta Bed<br>Gondwana<br>Crystalline<br>Rock           | The major soil types are:<br>Deep black soil 427.9<br>Medium deep black soil 136.4<br>Shallow black soil 421.5          | 1082.1 mm | Net Sown area 499<br>Area sown more than once 116<br>Gross cropped area 615       | Net Irrigated area: 134<br>Gross Irrigated area: 228.9<br>Rainfed Area: 499<br>Canal, open wells, Drip and sprinkler irrigation             | 123 percent        | 159          |
| 30     | Bhandara | Eastern Vidarbha Zone                                     | 342               | Rich alluvial soil, clayey loamy texture                                      | The major soil types are:<br>Deep mixed red and black soil 298.8<br>Shallow mixed red and black soil 45                 | 1361.3m m | Net Sown area 178<br>Area sown more than once 64.9<br>Gross cropped area 243.2    | Net Irrigated area: 107<br>Gross Irrigated area: 139<br>Canal, open well and lift irrigation                                                | 136 percent        | 62           |

| S. No. | District   | Agro Climatic Zone                             | Geographical Area | Geology                                             | Soil Type                                                                                                       | Rainfall  | Agricultural Land-use                                                            | Irrigation                                                                                                                            | Cropping Intensity | Forest Cover |
|--------|------------|------------------------------------------------|-------------------|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|-----------|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------|
|        |            |                                                |                   |                                                     | Medium deep mixed red and black soil 27.1                                                                       |           |                                                                                  |                                                                                                                                       |                    |              |
| 31     | Chandrapur | Central Vidarbha Zone<br>Eastern Vidarbha Zone | 1092              | Alluvium Basalt<br>Gondwana Vindhyan<br>Crystalline | The major soil types are:<br>Deep black soil 618.5<br>Shallow black soil 278.7<br>Medium deep black soil 114.7  | 1337.0 mm | Net Sown area 451.5<br>Area sown more than once 80.6<br>Gross cropped area 532.1 | Net Irrigated area: 107<br>Gross Irrigated area: 118<br>Rainfed Area: 344.5<br>Canal and open well irrigation                         | 118 percent        | 388.2        |
| 32     | Gadchiroli | Eastern Vidarbha Zone                          | 1492              | Alluvium Soil and laterite                          | The major soil types are:<br>Deep Black soil 1079.1<br>Medium deep black soil 302.2<br>Shallow black soil 110.6 | 1428.5 mm | Net Sown area 148<br>Area sown more than once 49<br>Gross cropped area 197       | Net Irrigated area: 56.3<br>Gross Irrigated area: 60.7<br>Rainfed Area: 135.9<br>Canal, tank, open well, borewell and lift irrigation | 133 percent        | 1133         |
| 33     | Gondia     | Eastern Vidarbha zone                          | 586               | Alluvium and Laterite                               | The major soil type is:<br>Deep black soil 462.3<br>Medium Deep black soil 46.5<br>Shallow black soil 77.1      | 1377.9 mm | Net Sown area 182.9<br>Area sown more than once 46.5<br>Gross cropped area 229.4 | Net Irrigated area: 98.6<br>Gross Irrigated area: 110.8<br>Rainfed Area: 84.3<br>Canal and Open wells                                 | 125 percent        | 215          |

Source: Department of Agriculture Cooperation and Farmers Welfare

## F.5 Biodiversity and Forest Cover

Maharashtra's forest lies on the borders of Madhya Pradesh state as well as the Sahyadri region too. Some of these areas are converted into wildlife reserves thus preserving the biodiversity. The state has 61,358 sq. km (6,135.8 thousand Ha) under forest cover which is 19.94 percent to the total geographical area of the state<sup>31</sup>. Out of this 10.79 percent is in Vidarbha region, 8.21 percent in western Maharashtra region and remaining 0.94 percent in Marathwada region.

Out of the 307.71 lakh Ha of total geographical area, very dense forest cover is available in 8.7 Lakh Ha, moderate dense forest cover is available in 20.75 Lakh Ha and open forest is available in 21.17 lakh Ha as per India State of Forest report 2015.

District-wise forest distribution statistics indicate that Latur has the least area under forest cover and Gadchiroli has the largest forest cover.

Maharashtra has 6 National Parks and 35 Wildlife Sanctuaries covering an area of 15,526 sq. km (1552.6 thousand Ha) which constitute 5.04 percent of the state's geographic area. Some of the most visited national parks include Chaprala Wildlife Sanctuary, Tipesher, Tadoba National Park, Navegaon National Park, Tipesher, Chikhaldhara, Dajipur, Bharmragarh Wildlife Sanctuary, Bor Wildlife Sanctuary. The national parks of Maharashtra are full of variety of plant species that include Jamun, Palas, Shisam, Kate sawar, Neem, Teak, Dhawada, Kalam, Saja/Ain, Bija, Shirish, Mango, Acacia, Awala, Kadamba, Moha, Acacia, Terminalia, Hedu, Ficus.

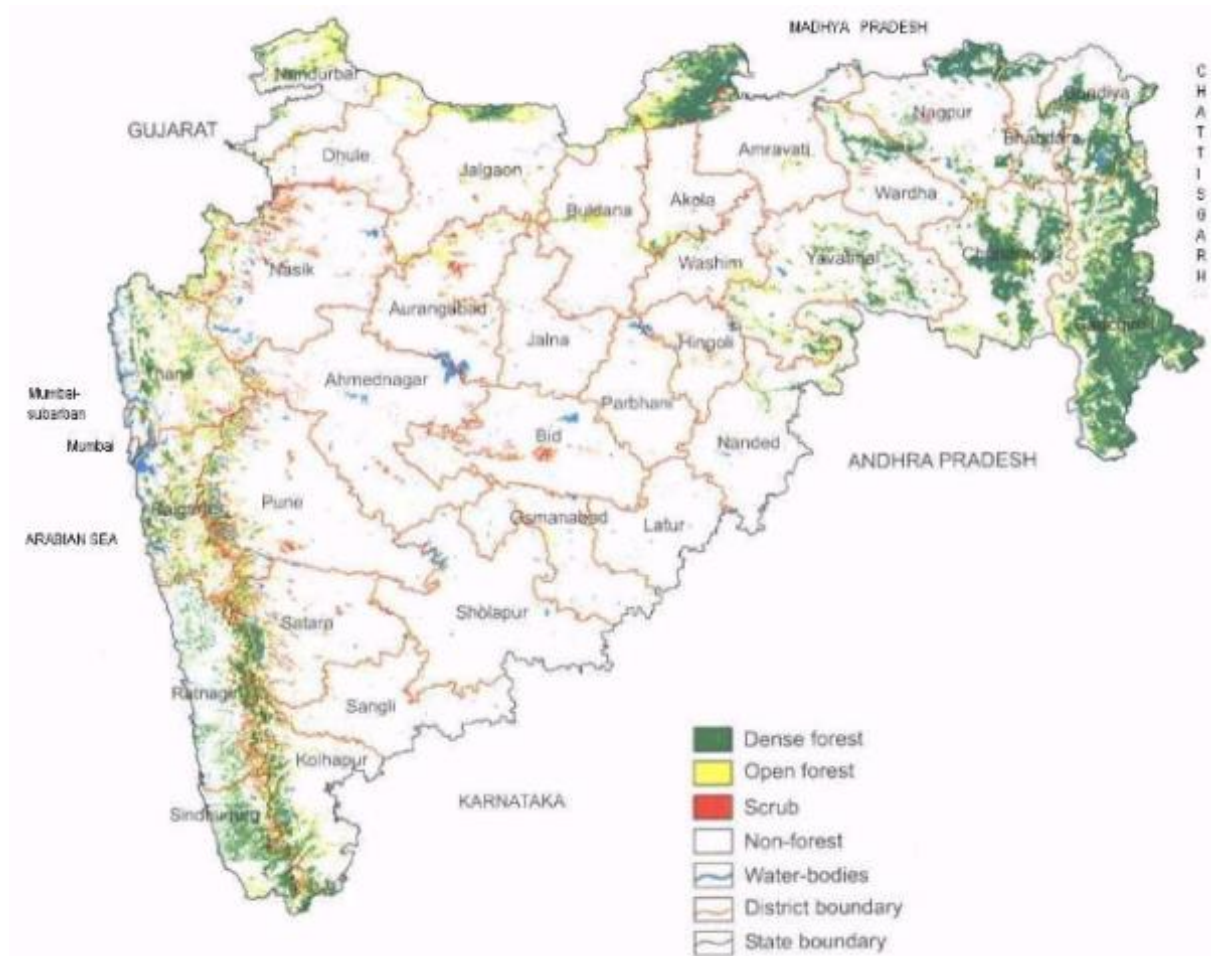
Maharashtra has a migratory species and many more exclusive wildlife species of the various national parks giant Indian squirrel, tiger, spotted deer, sambhar, Blackbuck, wild dog, butterflies, python, barking deer, flying fox, Rhesus macaque, crocodile, wolves, Indian antelope, neelgai, hyena, fishes, Bonnet Macaque, Black napped hare, etc.

The map showing forest cover of Maharashtra is as indicated in Figure below.

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<sup>31</sup> A statistic Outline current salient forest statistics 2013, Forest Department, Government of Maharashtra

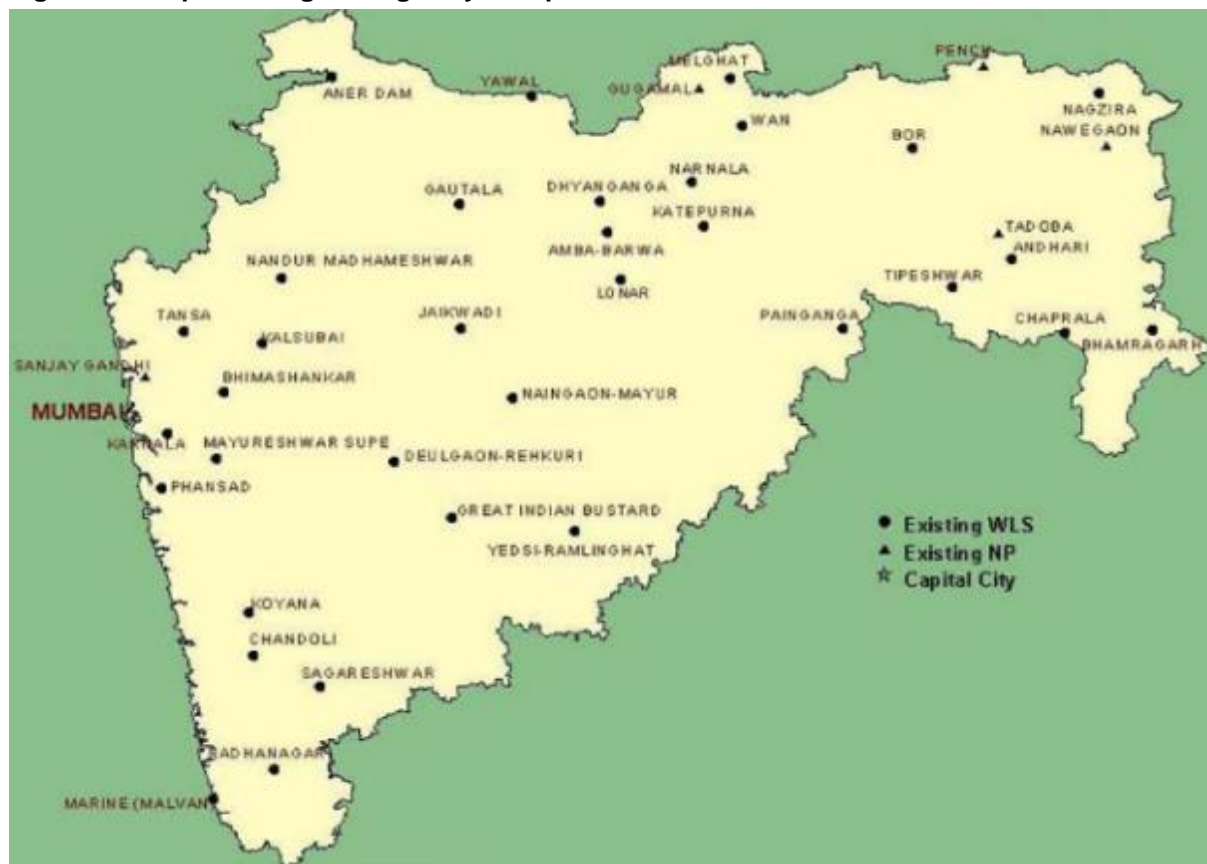
**Figure 33: Maharashtra Forest Cover Map**



Source: Forest Survey of India 2017

Map showing wildlife protected areas in Maharashtra is as indicated in the Figure below.

Figure 34: Map Showing Ecologically Hotspots in Maharashtra



Source: Department of Forest, Government of Maharashtra

District wise forest cover is as indicated in Table 84.

## F.6 Wetlands

As per the Ramsar Convention on Wetlands 1971, wetlands are area of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary with water that is static or flowing fresh, brackish or salt, including area of marine water the depth of which at low tide does not exceed 6 m.

Wetlands, marshes play a major role in treating and detoxifying wastes. Natural wetlands such as riparian wetland reduces nutrient load by removing nitrate and phosphorous from surface and subsurface runoff. Some wetland has been found to reduce nitrate by more than 80 percent. Wetlands play an important role in flood control. Wetlands help lessen the impacts of flooding by absorbing water and reducing the speed at which flood water flows. During periods of flooding, they trap suspended solids and nutrient load. They are a natural capital substitute for conventional flood control investments such as dykes, dams, and embankments.

Wetland area in Maharashtra is estimated to be 1,014,522 Ha which accounts to 3.30 percent of the total geographical area of the state<sup>32</sup>. The district with largest wetlands area is Mumbai suburban (24.87 percent) and Mumbai Urban (11.06 percent) of their total area due to the

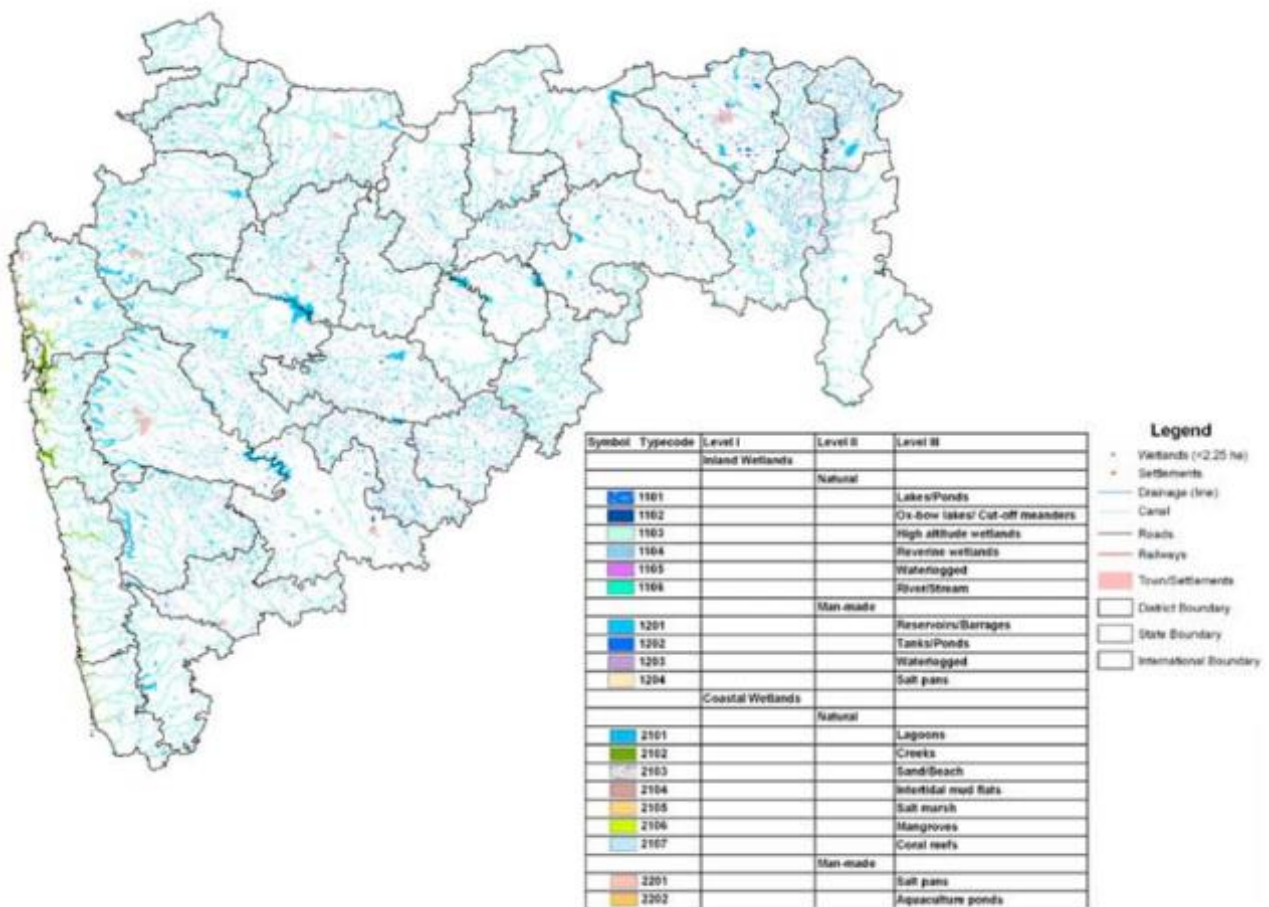
<sup>32</sup> Jay Samant, Wetland Conservation in Maharashtra Need Threat and Potential, Proceedings of International Conference SWRDM 2012

coastal wetlands. Pune district has the largest inland wetlands (6.72 percent) in the state, mainly because of the number of large dams in the Western Ghats part of the district. Out of the total 1,014,522 Ha of wetland 36.29 percent of wetland are reservoir / barrages, 20.57 percent are tanks / ponds, 29.54 percent are rivers or stream, creeks constitute 4.10 percent and mangroves constitute 2.98 percent.

India has 27 sites listed as Ramsar sites or notified wetlands as on February 2019. However, the list does not include any wetland from Maharashtra. An additional list of 135 wetlands have been identified as potential Ramsar Sites based on their biodiversity value and includes 3 sites from Maharashtra.

As part of National Wetland Inventory and Assessment (NWIA) project Maharashtra Remote Sensing Application Centre (MRSAC) has been referred for the basic data on wetlands in Maharashtra. Below is the map showing wetland in Maharashtra by MRSAC.

**Figure 35: Maharashtra Wetland As per MRSAC Data**



Source: National Wetland Atlas: Maharashtra by MRSAC

## F.7 Crop wise Pest

**Table 85: Crop-wise Pest**

| Crop          | Pests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Jowar         | <ul style="list-style-type: none"> <li>• Insects such as Shoot fly, Stem borer, Midge, White grub, Armyworm, Pyrilla, Shoot bug, Earhead caterpillars, Sugar cane aphid, Spider mite.</li> <li>• Diseases such as Grain mold, Charcoal rot, Downy mildew, Ergot, red leaf spot, Rust.</li> <li>• Weeds in Broad leaf such as Cock'scomb, Common purselane, False amaranth, Horse purslane, Pigweed, Swinecress, Black nightshade, Sessilis joywood, Punarnava, Tropical spiderwort, Whitetop weed, Bullhead, Coat button.</li> <li>• Grasses such as Rabbit/crow foot grass, Goose grass, Barnyard grass, Crabgrass, Burmuda grass, Johnson grass, Gamba grass, Finger grass.</li> <li>• Sedges such as Purple nutsedge, Flat sedge.</li> <li>• Parasitic such as Witch weed</li> <li>• Nematodes such as Lesion nematode, Cyst nematode.</li> </ul>                                                           |
| Wheat         | <ul style="list-style-type: none"> <li>• Insect and mite such as Termite, Wheat aphid, Army worm / cut worm, American pod borer, Pink stem borer, shootfly, brown mite.</li> <li>• Disease such as Brown rust, Yellow/Strip rust, Black rust, Loose Smut, Karnal bunt, powdery mildew, Helminthosporium, leaf spot / leaf blotch, Foot rot, Alternaria leaf blight, Flag smut, Hill bunt, Head Scab</li> <li>• Nematodes such as Seed gall nematode, Cereal cyst nematode, Root knot nematode.</li> <li>• Weeds such as Lambs quarter, scarlet pimpernel, sweet clover, Fine leaf fumitory Corn spurry, Field bindweed, onion weed, swine cress, Jangali Palak, Yellow pea, Thistle weed</li> <li>• Grasses such as Wild oat, Canary grass, Blue grass, Rye grass, Purple nut sedge</li> <li>• Rodents pest such as Lesser bandicoot, Black rat, Field mouse, Soft furred field rat, Indian Gerbil.</li> </ul> |
| Rice          | <ul style="list-style-type: none"> <li>• Insect such as Yellow stem borer, brown plant hopper, Leaf folder, Gundhi bug, Gall midge, blue beetle.</li> <li>• Diseases such as Rice blast, Bacterial Leaf blight, Sheath blight, false smut, brown spot.</li> <li>• Nematodes such as Root knot nematode and white tip nematode.</li> <li>• Weeds such as Echinochloa crusgalli, Cyperus rotundus, weedy rice.</li> <li>• Rodents Smaller bandicoot, Soft furred field rat, Indian gerbil, Field mice.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                |
| Other Millets | <ul style="list-style-type: none"> <li>• Insects such as Cut worm, White grub, Shoot fly, Stem borer.</li> <li>• Disease such as Downy mildew, Rust, Blast.</li> <li>• Weeds such as Cock's comb, Common purselane, False amaranth, Horsepurslane, Pig weed, Swine cress Black night shade.</li> <li>• Grasses such as Rabbit / crow foot grass, Goose grass, Barnyard grass, crabgrass, Burmuda grass, Purple nutsedge, Flat sledge, Witch weed.</li> <li>• Rodents and birds.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Maize         | <ul style="list-style-type: none"> <li>• Insect such as Maize stem borer, Pink stem borer, Shoot fly.</li> <li>• Disease such as Turcicum leaf blight, Maydis leaf blight, Fusarium stalk rot, Charcoal rot, banded leaf and sheath blight, common rust.</li> <li>• Nematode such as cyst nematod.</li> <li>• Weeds such as Dactyloctenium aegyptium, Eleusine indica, Celosia argentea, Portulaca Oleracea, Digera arvensis, Euphorbia.</li> <li>• Rodents and parrots.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Red Gram      | <ul style="list-style-type: none"> <li>• Insects such as Pod borer, Pod fly, Leaf Webber, Spotted pod borer, Plume moth, Pulse beetle.</li> <li>• Disease such as Wilt, Pigeon pea sterility mosaic, stem blight, Dry root rot.</li> <li>• Weeds such as Horse purslane, Tick weed, Coat button, Pig weed, False amaranth, Black nightshade, Common purselane.</li> <li>• Grasses such as Crab grass, Yellow foxtail, Goose grass, Bermuda grass, rabbit / crow foot grass</li> <li>• Sedges such as Purple nutsedge, Flat sedge.</li> <li>• Nematodes such as Pigeon pea cyst nematodes and Reniform nematodes.</li> </ul>                                                                                                                                                                                                                                                                                    |
| Green Gram    | <ul style="list-style-type: none"> <li>• Insects such as Pod borer, Spotted pod borer, Spiny pod borer, Blue butterfly, Grass blue butterfly, Bihar hairy caterpillar, Stem fly, Pod weevil, Bean aphid, Leaf hopper, Pod fly, Lablab bug, White fly, Thrips, Blister beetle.</li> <li>• Nematodes such as Cyst nematodes, Root Knot nematode.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Black Gram    | <ul style="list-style-type: none"> <li>• Diseases such as Anthracnose, Bacterial leaf blight, Cercospora leaf spot, Powdery mildew, Root rot and leaf blight, Rust, Macrophomina blight, Yellow mosaic disease and Leaf crinkle disease.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| Crop          | Pests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Gram          | <ul style="list-style-type: none"> <li>• Weeds such as Pig weed, False amaranth, Horse purslane, Tick weed, Stonebreaker, Common lambs' quarter, Burclover, Canada Thistle, Field bindweed, Three flowered ticker foil.</li> <li>• Grass such as Goose grass, Rabbit/ crow foot grass, Barnyard grass.</li> <li>• Sledge such as Flat sedge.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Cotton        | <ul style="list-style-type: none"> <li>• Insects such as Leaf hopper, White fly, Thrips, Aphids, Mirids, Mealy bugs, Tobacco caterpillar, Pink boll worm, Spotted and spiny boll worm, Helicoverpa boll worm, Leaf roller, Red Cotton Bug, Dusky cotton bug, Semi-looper, Stem weevil, Shoot weevil.</li> <li>• Diseases such as Blackarm / Angular leaf spot / Bacterial blight, Alternaria Leaf spot, Myrothecium leaf spot, Root rot, Fusarium wilt, Cotton leaf curl virus, Grey Mildew, Verticillium wilt, Leaf rust.</li> <li>• Monocot Weeds such as Doob grass, Barnyard grass, Makra, Signal grass, Terpedo grass, Nut grass.</li> <li>• Dicot weeds such as Datura, Wild Jute, Cox comb, Carpet weed, Purselane, Coat Buttons, Hiran Khuri, Velvet leaf, Kanghi buti, Spurge, Carrot grass and silk leaf.</li> <li>• Nematodes such as Root knot Nematodes and Reniform Nematodes.</li> </ul> |
| Soybean       | <ul style="list-style-type: none"> <li>• Insects such as stem fly, Tobacco caterpillar, Green Semi loopers, Girdle beetle, Pod borer, White fly, Leaf miller.</li> <li>• Diseases such as Rust, Soybean mosaic, Collar rot, Charcoal rot, Rhizoctonia root rot, Bacterial pustule, Myrothecium leaf spot, Indian Bug Blight, Purple seed stain, Brown spot, No-podding /Phyllody /Bud proliferation.</li> <li>• Weeds such as Amaranthus viridis, Cyperus iria, Trianthema Portulacastrum, Euphorbia geniculata, Dactyloctenium aegyptium, Echinochloa Spp, Eleusine indica, Setaria glauca.</li> </ul>                                                                                                                                                                                                                                                                                                 |
| Mango         | <ul style="list-style-type: none"> <li>• Insects such as mango hopper, Mango Maely bug, Fruit fly, Inflorescence midge, stem borer, Bark eating caterpillar, Stone weevil, Red ant, Eriophyid mite, Termite</li> <li>• Disease such as Powdery mildew, Anthracnose, Die back, Sooty mould, mango malformation complex, Gummosis,</li> <li>• Post-harvest disease such as Anthracnose, Aspergillus rot, Stem end rot</li> <li>• Weeds such as Amaranthus viridis, Common purselane, false amaranth, carrot grass, Goat weed, Cotton buttons, Spanish needles, silk leaf, Madras Leaf flower, Dendrophthae, Bermuda grass, Barnyard grass</li> </ul>                                                                                                                                                                                                                                                      |
| Cashew nut    | <ul style="list-style-type: none"> <li>• Insects such as Mosquito bug, Stem and root borer, leaf miner, leaf and blossom webber, flower thrip, Foliage thrips</li> <li>• Disease such as Dieback or pink disease, damping off, Anthracnose, inflorescence blight, Shoot rot and leaf fall</li> <li>• Weeds such as Pig weed, Common purselane, false amaranth, Carrot grass, Goat weed, Coat button, Bermuda grass, Barnyard grass</li> <li>• Sledges such as purple sledge and flat sledge.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                 |
| Grapes        | <ul style="list-style-type: none"> <li>• Insects such as Mealybugs, Flea Beetle, Girdle beetle/grape cane girdler, Thrips, Hoppers, Stem borer, Leaf eating caterpillar, Greap leaf folder, Red mite.</li> <li>• Dieses such as Downy mildew, Powdery mildew, Anthracnose, Greenaria bitter rot, bacterial leaf spot, Alternaria blight, Black rot, Post.</li> <li>• Harvesting diseases such as Blue mould rot, Black mould rot, Green mould, Rhizopus, botrytis bunch rot or gray mould of grape.</li> <li>• Nematode such as Root - knot nematode, Reniform nematode.</li> <li>• Weeds such as in broad leaf Pigweed, Common purselane, False amaranth, carrot grass, Goat weed, Coat buttons, Spanish needles, Silk leaf, Madras leaf flowers.</li> </ul> <p>In Grass Barnyard grass, Bermuda grass. In sedges – Purple nutsedge, flat sedge.</p>                                                   |
| Pomegranate   | <ul style="list-style-type: none"> <li>• Insects such as Anar butterfly, Stem borer, whitefly, Shot hole borer, Thrips, Fruit borer.</li> <li>• Diseases such as Bacterial leaf and fruit spot, Leaf and fruit spot, Anthracnose, Wilt.</li> <li>• Weeds such as in Broadleaf Tropical spiderwort, Swine cress, Horse purslane, Black nightshade, False amaranth, Puncture vine, Field bindweed, Common cocklebur, Asthma herb, Carrot grass.</li> <li>• In Grasses Bermuda grass, Annual brachiaria, Viper grass.</li> <li>• In sedges Purple nut sedge, Flat sedge.</li> </ul>                                                                                                                                                                                                                                                                                                                        |
| Custard Apple | <ul style="list-style-type: none"> <li>• Insects such as Mealybug, Fruit fly, Scales, Fruit borer.</li> <li>• Diseases such as Fruit rot &amp; anthracnose, Alternaria leaf spot, Cylindrocladium, Diplodia rot, Black canker.</li> <li>• Weeds such as in Broadleaf Horse purslane, Black nightshade, False amaranth, Puncture vine, Common cocklebur, Asthma herb/spurge, Carrot grass, Stone breaker, Sensitive plant, Broadleaf woodsorrel, Common purslane, Bermuda grass, annual brachiaria, Viper grass, Dropseed, Purple nut sedge.</li> <li>• Nematodes such as Spiral nematode, Stunt nematode.</li> <li>• Vertebrate pests such as lesser bandicoot, House rat/roof rat, Soft furred rat, Indian fruit bat, Pteropus giganteus.</li> </ul>                                                                                                                                                   |

| Crop       | Pests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Banana     | <ul style="list-style-type: none"> <li>● Insects such as Banana rhizome weevil, Banana stem weevil, banana leaf eating caterpillar, Banana aphid, Banana leaf and fruit scarring beetle, banana lacewing bug.</li> <li>● Banana thrips such as Rust thrips, Leaf thrips, Flower thrips.</li> <li>● Diseases such as Panama wilt, Anthracnose, Tip rot or bacterial soft rot, Banana bunchy top disease, Banana bract mosaic virus, Banana streak disease, Infectious chlorosis.</li> <li>● Weeds such as in Broad leaf Spiny pigweed, Slender pigweed, Carrot weed, Common purslane, Tridax daisy, Spurge, Knotweed, touch me not weed.</li> <li>● Grasses such as Bermuda grass, Crab grass, Indian goose grass.</li> <li>● Sedges such as Purple nut sedge.</li> </ul>                                                                                                                                                                                                                                                                                                                   |
| Papaya     | <ul style="list-style-type: none"> <li>● Insects such as Mealybug, Grasshopper.</li> <li>● Diseases such as Stem or foot or collar rot, Papaya ring spot disease, Papaya mosaic disease, Anthracnose, Anthracnose, Rhizopus rot, Fruit rot, Phomopsis, Stem end rot, Papaya leaf curl disease.</li> <li>● Weeds such as in broadleaf Carrot grass, Coat buttons, yellow spider flower, Asthma herb/Spurge, Cock's comb, Pigweed, Goat weed.</li> <li>● Grasses such as large crabgrass, Yellow foxtail, Goose grass, Bermuda grass.</li> <li>● Sedge such as Purple nutsedge, Flat sedge, Umbrella sedge.</li> <li>● Birds such as Jungle crow, Myna, Roseinged parakeet.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                       |
| Sweet Lime | <ul style="list-style-type: none"> <li>● Insects such as Aphid, Citrus psylla, Citrus leaf miner, Citrus/lemon butterfly, Citrus blackfly, Armoured scale, Mealybug, Fruit sucking moth.</li> <li>● Diseases such as Gummosis, Fruit rot, Anthracnose, Scab, Sooty mould, Citrus canker, Tristeza, Greening, Blue mould rot, Green mould rot, Sour rot.</li> <li>● Nematods such as Citrus nematode, Lance nematode, Lesion nematode.</li> <li>● Weeds in broad leaf weeds such as Tropical spiderwort, Swine cress, Horse purslane, Black nightshade, False amaranth, Puncture vine, Field bindweed, Common cocklebur, Spurge, Carrot grass.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Orange     | <ul style="list-style-type: none"> <li>● Grassy weeds such as Bermuda grass, Annual brachiaria</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Sapota     | <ul style="list-style-type: none"> <li>● Insects such as Leaf webber, Green scale, Fruit fly, Bud borer, Sapota seed borer, Bud worm, Stem borer, Hairy caterpillar, Leaf miner, Spiralling whitefly, Leaf twisting weevil, Scale.</li> <li>● Diseases such as Leaf spot, Leaf blight, Sooty mould, Basal rot, Heart rot, Anthracnose.</li> <li>● Postharvest diseases like Soft rot, Fruit rot.</li> <li>● Weeds Broadleaf such as Tick weed, Coat buttons, Congress grass, Horse Purslane, Crofton weed, Siam weed, False amaranth, Spurge, Crab grass, Yellow foxtail, Bermuda grass, Torpedo grass, Purple nutsedge, Flat sedge.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Guava      | <ul style="list-style-type: none"> <li>● Insects such as Fruit fly, bark eating caterpillar, Whitefly, Fruit borer complex like Capsule borer, Pomegranate butterfly, Fruit borer.</li> <li>● Diseases such as Guava wilt, Fruit rots, Stem canker, Fruit canker, Dieback, anthracnose and fruit rot.</li> <li>● Weeds in broad leaf such as coat buttons, beggar-ticks, silk leaf, Canoe weed, Mohanavallee, Amaranth, False amaranth, Asthma herb, Milk weed, Whitetop weed, horse purslane.</li> <li>● Grasses such as Bermuda grass, Hairy crabgrass, Egyptian crowfoot grass, Buffalo grass, Cogon grass</li> <li>● Sedges such as Purple nut sedge, Flat sedge.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                           |
| Tomato     | <ul style="list-style-type: none"> <li>● Insects such as Gram pod borer, Tobacco caterpillar, Whitefly, Serpentine leaf miner, Thrips, Red spider mite.</li> <li>● Diseases such as Damping off, Tomato leaf, Early blight, Late blight, bacterial Wilt, Fusarium wilt, Bacterial stem and fruit canker, Tomato mosaic disease, Bacterial fruits and leaf canker, Tomato mosaic disease, Bacterial fruits and leaf spots, Tomato spot wilt diseases, powdery mildew.</li> <li>● Nematodes such as Root-knot nematode, Reniform nematode.</li> <li>● Rodents such as Lesser bandicoot, Plam rat/house rat, Indian gerbil.</li> <li>● Weeds such as in Major Kharif in Broadleaf Pigweed, Swine crees, Black nightshade, Common purselane, False amarnath.</li> <li>● Grasses such as Rabbit/crow foor grass, Crab grass, Barnyard.</li> <li>● Sedges such as Purple nutsedge, Flat sedge.</li> <li>● Weeds in Major Rabi, in broadleaf Lamb's quarter, Scarlet pimpernel, Sweet clover, Fine leaf fumitory, Corn spurry.</li> <li>● In grasses such as Blue grass, Canary grass.</li> </ul> |

| Crop    | Pests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Potato  | <ul style="list-style-type: none"> <li>● Insects such as Aphids, Potato tuber moth, Jassids, Whitefly, Spider mites.</li> <li>● Nematode such as Root-knot nematode.</li> <li>● Diseases such as Late blight, Black scurf, Leaf spot complex, Septoria leaf spot, Early blight, Common scab, Bacterial wilt, Viral diseases (Potato virus X, S, Y and potato leaf roll virus)</li> <li>● Weeds in Kharif Broadleaf such as Pigweed, Swine cress, Black nightshade, Common purselane, False amaranth, Rabbit/crow foot grass, Crabgrass, Barnyard grass, Purple nutsedge, Flat sedge.</li> <li>● Rabi in Broadleaf such as Lamb's quarter, Scarlet pimpernel, Sweet clover, Fine leaf fumitory, Corn spurry, Goat weed, Rough medic, Broad leaf wood sorrel, Horse purslane, Onion weed, Field bindweed.</li> <li>● Grasses such as Blue grass, Canary grass</li> <li>● Rodent and non-rodent vertebrates' pests such as Lesser bandicoot, Indian creases porcupine, Wild boar.</li> </ul>                    |
| Onion   | <ul style="list-style-type: none"> <li>● Insects such as Onion thrips, Onion maggot, Buib mite, Eriophyid, Red spider mite.</li> <li>● Diseases such as Damping off, Purple blotch, Stemphylium leaf blight, Colletrichum blight/Anthracnose/Twister disease. Onion yellow deaf, Iris yellow spot, Fusarium basal rot.</li> <li>● Weeds such as in Major Kharif pigweed, Swine cress, Black nightshade, Common purselane, False amarnath.</li> <li>● Grassy such as Rabbit/crow foot grass, Crab grass, Barnyard grass.</li> <li>● Sedge such as Purple nutsedge, Flat sedge.</li> <li>● Major rabi weeds such as in Broad leaf Lamb's Quarter, Scarlet pimpernel, Sweet clover, Fine leaf fumitory, Corn spurry, Carrot grass.</li> <li>● Grassy such as Blue grass, Canary grass, Chinese love grass, Goose grass.</li> <li>● Sedge such as Purple nut sedge.</li> </ul>                                                                                                                                   |
| Chilli  | <ul style="list-style-type: none"> <li>● Insects such as Gram pod borer, Tobacco caterpillar, Red spider mite, Broad/yellow mite.</li> <li>● Aphids such as Aphis gossypii, Myzus persicae</li> <li>● Diseases such as Damping off, Die back and fruit rot, Choanephora blight, Mosaic complex, Powdery mildew, Cercospora leaf rot, bacterial leaf spot, Fusarium wilt, Alternaria leaf spot, Leaf curl disease.</li> <li>● Nematodes such as Root-knot nematode, Lesion nematode.</li> <li>● Weeds in Major Kharif weeds in Broadleaf such as Pigweed, Swine cress, Black nightshade, Common purselane, False amaranth.</li> <li>● Grasses such as Rabbit/crow foot grass, Crab grass, Barnyard grass</li> <li>● Sedges such as Purple nutsedge, Flat sedge.</li> <li>● Major Rabi weds in Broadleaf such as Lamb's quarter, Scarlet pimpernel, Sweet clover, Fine leaf fumitory, Corn spurry</li> <li>● Grasses such as Blue grass, Canary grass.</li> </ul>                                              |
| Brinjal | <ul style="list-style-type: none"> <li>● Insects and mite such as Fruit and shoot borer, Jassids, Hadda beetle, Whitefly, Aphids, Spider mites, Microtermes obesi, M.anandi, Odontotermes, O.assumthi, O.taprobenes, Eremotermes nerapololis, Eremotermes nerapololis, Trinervitermes biformis.</li> <li>● Diseases such as Damping off, Phomopsis blight, Little leaf of brinjal, Bacterial wilt.</li> <li>● Nematodes such as Root-knot nematode.</li> <li>● Rodent pests such as Lesser bandicoot, Plam rat/house rat, Indian gerbil</li> <li>● Weeds in Major Kharif weeds Broadleaf weeds such as Pigweed, Swine cress, Black nightshade, Common purselane, False amaranth.</li> <li>● Grassy weeds such as Rabbit/crow foot grass, Crabgrass, Barnyard grass, Purple nutsedge, Flat sedge.</li> <li>● Major Rabi weeds in Broadleaf weeds such as Lamb's quarter, Scarlet Pimpernel, Sweet clover, Fine leaf fumitory, Corn spurry</li> <li>● Grassy weed such as Blue grass, Canary grass.</li> </ul> |
| Okra    | <ul style="list-style-type: none"> <li>● Insects and mite such as Shoot and fruit borer, Gram pod borer, Jassids, Aphids, Whitefly, Red spider mite.</li> <li>● Diseases such as Damping off, Yellow vein mosaic disease. Powdery mildew, Leaf spot.</li> <li>● Weeds in Major kharif weeds Such as in Broadleaf weeds Pigweed, Swine cress, Black nightshade, Common purselane, False amaranth.</li> <li>● Grassy weeds such as Rabbit/Crow foot grass, Crabgrass, Barnyard grass, Purple nutsedge, Purple nutsedge, Flat sedge.</li> <li>● Major rabi weeds in Broadleaf weeds such as Lamb's quarter, Scarlet Pimpernel, Sweet clover, Fine leaf fumitory, Corn spurry</li> <li>● Grassy weeds such as Blue grass, Canary grass.</li> </ul>                                                                                                                                                                                                                                                               |
| Beans   | <ul style="list-style-type: none"> <li>● Insects and mite pests such as bean aphid, Jassid, Whitefly, Red spider mite, Hairy caterpillar, Stem fly, Gram pod borer, Pod bugs</li> <li>● Diseases such as Ashy stem blight, Powdery mildew, Rust, Mosaic disease, Anthracnose, Bacterial leaf spot.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

| Crop     | Pests                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cucumber | <ul style="list-style-type: none"> <li>● Weeds in Broadleaf such as False daisy, Asthma herb, Carrot grass, Slender amaranth/green amaranth, Lamb's quarters, Sweet clover, Scarlet/red pimpernel</li> <li>● Grasses such as Crow foot grass, Burmuda grass, Barnyard grass, hairy crabgrass</li> <li>● Sedges such as Purple nut sedge.</li> <li>● Insects and mites such as Cucurbit fruit fly, Pumpkin beetles, Epilachna beetles, Serpentine leaf miner, Aphids, Pumpkin leaf caterpillar.</li> <li>● Diseases such as Downy mildew, Powdery mildew, Cucumber mosaic, Fusarium wilt.</li> <li>● Weeds in major Kharif weeds Broadleaf weeds such as Pigweed, Swine cress, Black nightshade, Common purselane, False amaranth, Congress weed, Witch weed</li> <li>● Grassy weeds such as Rabbit/Crow foot grass,</li> <li>● Crabgrass, Barnyard grass</li> <li>● Sedges such as Purple nutsedge, Flat sedge</li> <li>● Major Rabi weeds in Broadleaf weeds such as Lamb's quarter, Scarlet Pimpernel, Sweet clover, Fine leaf fumitory, Corn spurry</li> <li>● Grassy weeds such as Blue grass, Canary grass.</li> </ul> |
| Turmeric | <ul style="list-style-type: none"> <li>● Insects such as Shoot borer, Rhizome scale</li> <li>● Diseases such as Rhizome rot, Leaf spot, Leaf blotch</li> <li>● Weeds in Major Kharif Broad leaf such as Pigweed, Swine cress, Black nightshade, Common purselane, False amaranth, Carrot grass.</li> <li>● Grassy such as Rabbit/crow foot grass, Crab grass, Barnyard grass, Chinese lovegrass, Goose grass.</li> <li>● Sedges such as Purple nutsedge, Flat sedge</li> <li>● Major rabi in Broad leaf such as Lamb's quarter, Scarlet Pimpernel, Sweet clover, Fine leaf fumitory, Corn spurry</li> <li>● Grassy such as Blue grass.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Gourds   | <ul style="list-style-type: none"> <li>● Insects and mites such as Cucurbit fruit fly, Pumpkin beetles, Epilachna beetles, Serpentine leaf miner, Aphids, Pumpkin leaf caterpillar.</li> <li>● Diseases such as Downy mildew, Powdery mildew, Cucumber mosaic, Fusarium wilt.</li> <li>● Weeds in major Kharif weeds Broadleaf weeds such as Pigweed, Swine cress, Black nightshade, Common purselane, False amaranth, Congress weed, Witch weed</li> <li>● Grassy weeds such as Rabbit/Crow foot grass,</li> <li>● Crabgrass, Barnyard grass</li> <li>● Sedges such as Purple nutsedge, Flat sedge</li> <li>● Major Rabi weeds in Broadleaf weeds such as Lamb's quarter, Scarlet Pimpernel, Sweet clover, Fine leaf fumitory, Corn spurry</li> <li>● Grassy weeds such as Blue grass, Canary grass.</li> </ul>                                                                                                                                                                                                                                                                                                            |

Source: Directorate of Plant Protection Quarantine and Storage, Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture and Farmer Welfare, Gol

## F.8 List of Banned Pesticides in India

Figure 36: List of Pesticides and its Formulations banned in India

| Banned for use but manufactured and exported                                                              | Formulation banned                                                                                                                                                                     | Pesticides Withdrawn                                                                                                                                                                                   | Pesticides Refused Registration                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Pesticides Refused Registration                                                                                                                                                                                                                                                                                                                                         | Banned for Manufacture import and Use                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>- Nicotin Sulfate</li> <li>- Captafol 80 percent powder</li> </ul> | <ul style="list-style-type: none"> <li>- Methomyl 24 percent L</li> <li>- Methomyl 12.5 percent L</li> <li>- Phosphamidon 85 percent SL</li> <li>- Carbofuron 50 percent SP</li> </ul> | <ul style="list-style-type: none"> <li>- Dalapon</li> <li>- Ferbam</li> <li>- Formothion</li> <li>- Nickel Chloride</li> <li>- Paradichloro benzene</li> <li>- Simazine</li> <li>- Warfarin</li> </ul> | <ul style="list-style-type: none"> <li>- Calcium Arsonate</li> <li>- EMP</li> <li>- Azinphos Methyl</li> <li>- Lead Arsonate</li> <li>- Mevinphos</li> <li>- 2,4,5 T</li> <li>- Carbophenothion</li> <li>- Vamidothion</li> <li>- Mephosfolan</li> <li>- Azinphos Ethyl</li> <li>- Binapacryl</li> <li>- Dicrotophos</li> <li>- Thiodemeton / Disulfoton</li> <li>- Fentin Acetate</li> <li>- Fentin Hydroxide</li> <li>- Chinomethionate</li> <li>- Ammonium Sulphamate</li> <li>- Leptophos</li> </ul> | <ul style="list-style-type: none"> <li>- Aluminium Phosphide</li> <li>- DDT</li> <li>- Lindane</li> <li>- Methyl Bromide</li> <li>- Methyl Parathion</li> <li>- Sodium Cyanide</li> <li>- Methoxy ethyl Mercuric Chloride</li> <li>- Monochrotophos</li> <li>- Endosulfan</li> <li>- Fenitrothion</li> <li>- Diazinon</li> <li>- Fenthion</li> <li>- Dazomet</li> </ul> | <ul style="list-style-type: none"> <li>- Aldrin</li> <li>- Benzene Hexachloride</li> <li>- Calcium Cyanide</li> <li>- Chlordane</li> <li>- Copper Acetoarsenite</li> <li>- Clbromochloropropane</li> <li>- Endrin</li> <li>- Ethyl Mercury Chloride</li> <li>- Ethyl Parathion</li> <li>- Heptachlor</li> <li>- Menazone</li> <li>- Nitrofen</li> <li>- Paraquat Dimethyl Sulphate</li> <li>- Pentachloro Nitrobenzene</li> <li>- Pentachlorophenol</li> <li>- Phenyl Mercury Acetate</li> <li>- Sodim Methane Arsonate</li> <li>- Tetradifon</li> <li>- Toxafen</li> <li>- Aldicarb</li> <li>- Chlorobenzilate</li> <li>- Dieldrine</li> <li>- Maleic Hydrazide</li> <li>- Ethylene Dibromide</li> <li>- Trichloro Acetic Acid</li> <li>- Metoxuron</li> <li>- Chlorofenvinphos</li> </ul> |

## F.9 Health and Safety – Food and Beverages

Food safety and quality have been gaining considerable importance at the state, national and international level since enhanced food safety is key to improvements to health and nutrition. Food safety, besides reducing cost of food borne diseases, enhances food security, increased trade, expands income generation and thus assists in poverty alleviation, raise living standard and reduce negative stimulate economic development.

This food safety refers to the agricultural growth of commodities & use of pesticides & insecticides while growing. It also refers to the practices after harvesting & during transportation & Storage of agricultural goods.

In Maharashtra, food safety has not been taken seriously by farmers or growers & food handlers. Some of the Challenges faced are:

- Lack of formal Education;
- Lack of awareness towards GAP (Good Agricultural Practices), Food safety practices;
- Lack of sufficient resources to make farmers aware of everything;
- Lack of government laboratories to test all the required parameters;
- Distance of market from the farms;
- Lack of agricultural commodity's processing, packaging & exporting;
- Lack of government schemes;
- Poor knowledge of personal hygiene;
- A weak policy & regulatory framework;
- Inadequate enforcement of existing standards; and
- Predominance of small farms.

## F.10 Good Agriculture Practices

GAP Practices that address environmental, economical & social sustainability for on farm process which results in safe & quality food & agricultural produce.

Other GAP benefits are –

- Consistent crop & safe food quality,
- Safe environment which leads to other benefits,
- Soil quality improvement,
- Facilitation domestic & export market access and
- Reduction in noncompliance risks i.e. Permitted pesticides, MRL's & other hazards.

There are few challenges to adopt GAP in Maharashtra's agricultural sector

- Lack of general awareness, education & benefits of implementing GAP,
- Small & divided farming land,
- Same crop over years,
- Not many farmer's association,
- Lack of awareness & training about GAP & its benefits,

- Increase in production cost which includes trained personnel, record keeping, residue testing, soil & water testing, organic manure etc,
- Inadequate access to support system,
- Insufficient infrastructure and
- Inadequate funds.

Recommendations to Adopt GAP in Maharashtra –

- Small group of trainers needs to be identified who can train the farmers in different regions for different crops;
- Capacity building of farmers & their families through awareness camps & training programmes at district level;
- Capacity improvement of existing setup of government testing laboratories;
- Make funds available from government banks at lower interest rates; and
- Government can open farmer's school where they can come & learn Good practices through practical trainings.

Needs to setup few cold storages, common facility centres, primary processing & packaging facilities at district level.

### F.11 Commodity Wise MRL

Food Safety and Standard Act 2006 regulates manufacturing storage distribution sale and import of food which includes GM food.

Commodity wise Maximum Residue Level as per Food Safety Standard (contamination toxins and residue) Regulation 2011 is as indicated in Annexure C.

### F.12 Cartagena Protocol on Biosafety

India is signatory to the Cartagena Protocol on biosafety and ratified it on January 23<sup>rd</sup>, 2003. As per article 20 of the Cartagena protocol a Bio Safety Clearing house has been set-up in order to facilitate the exchange of scientific, technical, environmental and legal information on Living Modified Organism (LMO).

Pursuant to section 6, 8 and 25 of Environmental Protection Act 1986 and with the view to protecting the Environment, nature and health in connection with application of gene technology and microorganism, India has ratified the rule for Manufacture / Use / Import / Export and storage of Hazardous Microorganism or Genetically Engineered Organism Rule 1989. As per the regulation, no person shall import export transport manufacture store or process use or sell any GMO substance or cell except with approval of GEAC. Regulatory committee is set-up in each district where research and application of GMOs are contemplated.

As per the regulations in India, there are procedures for import / export of GE planting material for research purpose, quarantine processing of transgenic planting material and procedure for approval of confined field trials and environmental release of GE plants.

As per the mandate, Ministry of Agriculture must draft policies aimed at agriculture growth, Indian Council of Agriculture Research (ICAR) is responsible for monitoring the benefit of Genetically modified technology and monitoring post release performance of GM crops.

Ministry of Agriculture has formulated National Seeds Policy 2002. As per the policy transgenic crops varieties are tested to determine the agronomic value for at least two seasons by ICAR before any variety

is commercially released in the market. Performance of the commercially released varieties are monitored for at least 3 to 5 years by the Ministry of Agriculture and State Department of Agriculture. All seeds imported into the country are required to be accompanied by a certificate from the Competent Authority of the exporting country regarding transgenic character or otherwise.

The Project shall comply with the regulations ratified in India with respect to Cartagena Protocol applicable to agricultural sector.

### F.13 Sheep and Goat Rearing Practices

Sheep and goat rearing are traditional occupations of economically weaker sections of society, particularly in rain shadow areas. These two species have been a major source of economic sustenance and financial cushioning, especially for economically weaker sections of society. In India 83.4 percent of goat rearers belong to landless, small and marginal farmers category and 84.4 percent belong to SC / ST and OBC communities. Goat rearing is dominant in ecologically vulnerable and drought prone areas.

Goat breeds of Maharashtra are Osmanabadi goat, Sangamneri goat, Surti and Konkan Kanyal. The breeds of sheep reared in Maharashtra are Deccani sheep and Mandgyal sheep. In Maharashtra. As per 2012 livestock census, the state has 25.80 lakh sheep and 84.35 lakh Goat.

Estimated meat production from sheep and goat different sources in Maharashtra during summer 2016-17 are as follows:

**Table 86: Estimated Meat Production from sheep and Goat Annual 2016-17**

| S. No                                           | Species | Estimated no of Animals Slaughtered (Lakhs) | Average Meat Production / animal (kg) | Total meat production (000' M.T) |
|-------------------------------------------------|---------|---------------------------------------------|---------------------------------------|----------------------------------|
| <b>From Registered Slaughter Houses</b>         |         |                                             |                                       |                                  |
| 1                                               | Sheep   | 3.761                                       | 12.749                                | 4.798                            |
| 2                                               | Goat    | 6.593                                       | 12.261                                | 8.064                            |
| <b>From House Hold and Butcher Shop (Rural)</b> |         |                                             |                                       |                                  |
| 1                                               | Sheep   | 6.082                                       | 12.223                                | 7.434                            |
| 2                                               | Goat    | 42.681                                      | 11.392                                | 48.601                           |
| <b>From House Hold and Butcher Shop (Urban)</b> |         |                                             |                                       |                                  |
| 1                                               | Sheep   | 2.177                                       | 12.58                                 | 2.739                            |
| 2                                               | Goat    | 37.716                                      | 12.201                                | 45.834                           |

Source: Government of Maharashtra, Department of Animal Husbandry, Integrated Sample Survey Scheme 2016-17

Maharashtra ranks 2<sup>nd</sup> in terms of meat production and 7<sup>th</sup> in terms of wool production among major livestock production states in India.

### F.14 Climate Change Impacts on Crops

Agriculture is the sector most vulnerable to climate change due to its high dependence on climate and weather. The Maharashtra agricultural sector is already facing problems due to climate change and occurrence and intensity of drought have increased over the years in Maharashtra. These concerns have grown in recent years as altered rainfall patterns associated with climate change have become more frequent, increasing the likelihood of short-run crop failures and long-run production declines. Small, Marginal farmers and agricultural laborers, who are poor and have few assets and limited access to credit and insurance, are the worst affected.

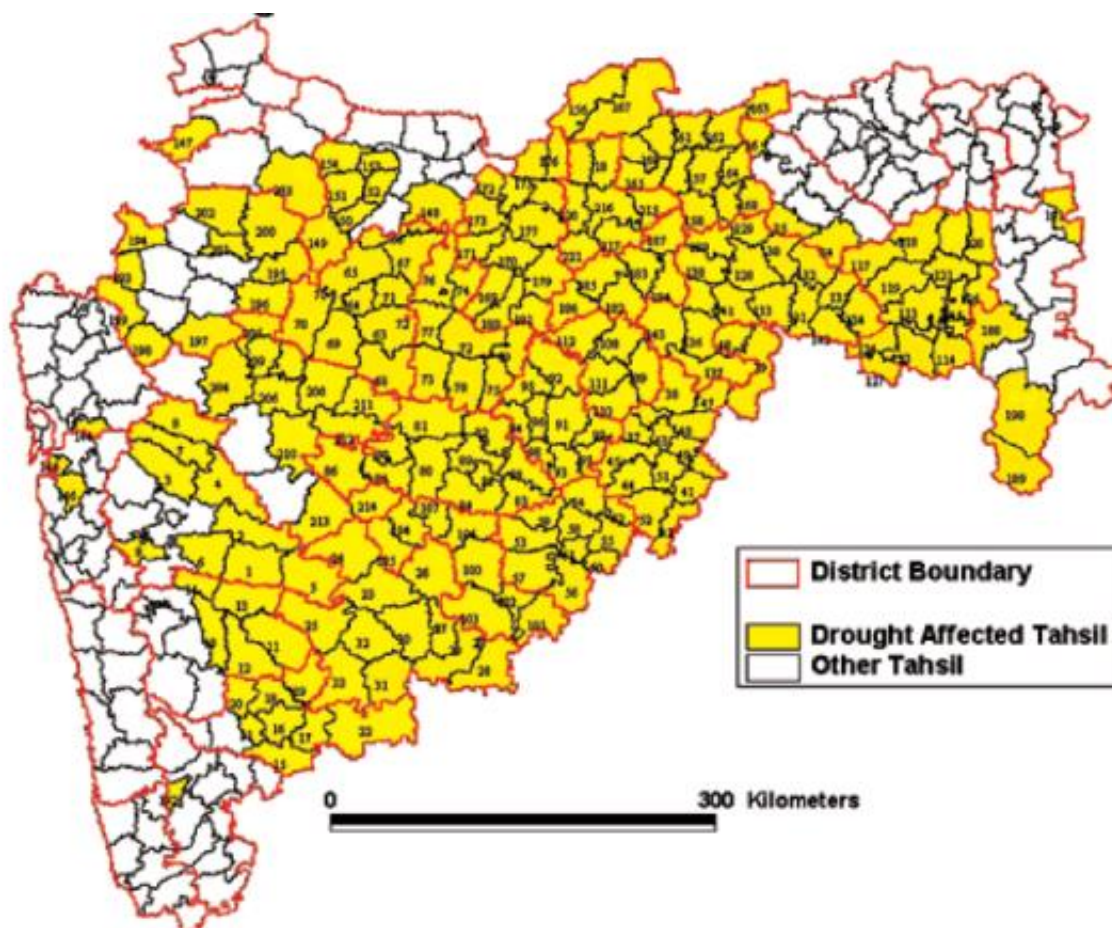
The worst affected districts in Maharashtra are Sholapur, Osmanabad, Nanded, Aurangabad, Ahmednagar, Sangli, Satara, Beed, Nashik, Buldhana, Latur, Jalna, Jalgaon and Dhule.

Agriculture in Maharashtra is mainly dependent on rainfall, presently irrigated area in the state is just 17 percent which is expected to increase to 23 percent. This means more than 75 percent area will remain dependent on rainfall. Water requirement for most of the crop shown in state is less than 1200 mm and hence rainfall is sufficient to raise the crops if one or two protective irrigation is provided.

The trends of rainfall in different regions of Maharashtra indicate that it is declining in Konkan slightly and in Madhya Maharashtra sharply during monsoon season and increasing in post monsoon season. Thus, annual rainfall is not affected much. But, kharif crops productivity is affected adversely. Increasing trend in post monsoon season in whole Maharashtra increases black mould in sorghum and favours incidence of *Heliothis* spp. in cotton and red gram.

Drought affected tahsils of Maharashtra State are as presented in Figure below.

**Figure 37: Drought Affected Tahsils of Maharashtra**



Source: State Disaster Management Authority Mantralaya, Mumbai, April 2016, Disaster Management Unit, Relief and Rehabilitation Department, Government of Maharashtra

History of disaster in the state of Maharashtra are as indicated in the table below.

**Table 87: History of Natural Disaster in Maharashtra**

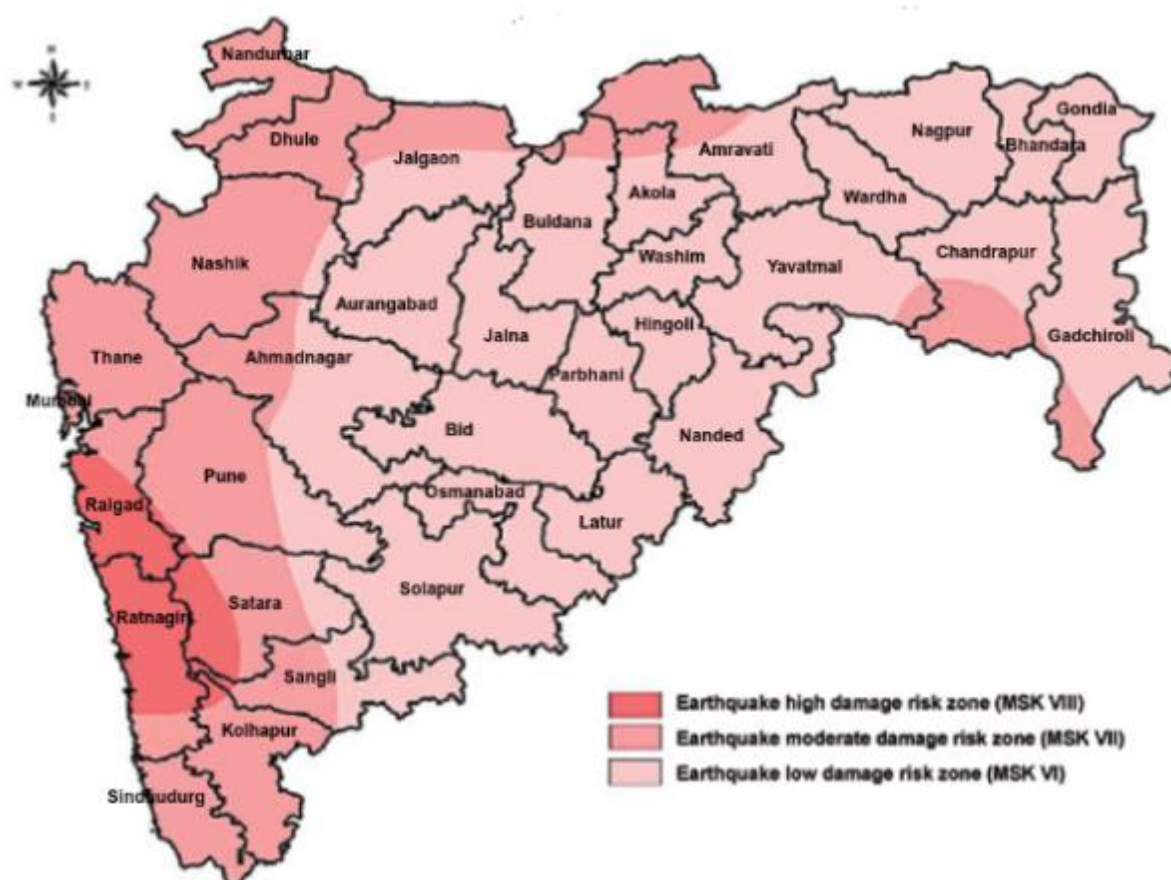
| Natural Disaster | History                                       | Vulnerable Area            |
|------------------|-----------------------------------------------|----------------------------|
| Flood            | 33 districts in 2005 and 31 districts in 2006 | All districts of the state |

| Natural Disaster                                          | History                                                                  | Vulnerable Area                                                            |
|-----------------------------------------------------------|--------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Cyclones                                                  | 1882 Bombay                                                              | Six coastal districts including Mumbai                                     |
| Hail Storm                                                | Occasional                                                               | Some parts of the state specially Marathwada and Vidarbha                  |
| Extreme heavy rainfall sometimes resulting in cloud burst | 26th July 2005 Mumbai<br>2006 Chiplun & Mahad<br>2007 Amravati & Chiplun | Especially Konkan area                                                     |
| Heat waves                                                | Vidarbha region and Nashik region                                        | Marathwada, Vidarbha and Nashik division.                                  |
| Drought                                                   | 2001, 2002, 2003, 2004, 2008, 2011, 2012, 2013                           | Drought Prone districts especially Marathwada, and parts of Vidarbha       |
| Sea erosion                                               | Konkan, 720 km of coast                                                  | Konkan division districts                                                  |
| Earthquake                                                | 1967 Koyna earthquake<br>1993 Latur earthquake                           | High risk: Ratnagiri, Raigad, Satara, Thane and Latur.                     |
| Landslide and Mud flow                                    | 2005 Mumbai, Mahad<br>2006 Ratnagiri                                     | High risk Ratnagiri, Raigad, Satara, Thane, Nashik, Mumbai and Sindhudurg. |
| Dam failures / Dam burst                                  | 1961 Panshet                                                             | 106 major dams across state may be a secondary disaster                    |

Source: State Disaster Management Authority Mantralaya, Mumbai, April 2016, Disaster Management Unit, Relief and Rehabilitation Department, Government of Maharashtra

Earthquake zones in Maharashtra is as presented in the Figure below.

**Figure 38: Earthquake Zones in Maharashtra**



Source: State Disaster Management Authority Mantralaya, Mumbai, April 2016, Disaster Management Unit, Relief and Rehabilitation Department, Government of Maharashtra

### F.14.1 National Mission on Sustainable Agriculture

Ministry of Agriculture and Farmers Welfare, Government of India has formulated National Mission on Sustainable Agriculture (NMSA) for enhancing agricultural productivity especially in rainfed areas focusing on integrated farming, water use efficiency, soil health management and synergizing resource conservation. NMSA derives its mandate from Sustainable Agriculture Mission which is one of the eight Missions outlined under National Action Plan on Climate Change (NAPCC).

NMSA will cater to key dimensions of 'Water use efficiency', 'Nutrient Management' and 'Livelihood diversification' through adoption of sustainable development pathway by progressively shifting to environmentally friendly technologies, adoption of energy efficient equipment, conservation of natural resources, integrated farming, etc. Besides, NMSA aims at promoting location specific improved agronomic practices through soil health management, enhanced water use efficiency, judicious use of chemicals, crop diversification, progressive adoption of crop-livestock farming systems and integrated approaches like crop-sericulture, agro-forestry, fish farming, etc

The Components of NMSA are:

- Rainfed Area Development,
- Sub-mission on Agroforestry,
- National Bamboo Mission,
- Soil Health Management and
- Climate Change and Sustainable Agriculture – Monitoring Modelling and Networking.

Under the climate change and sustainable agriculture component of NMSA, a consortium approach has been evolved with various stake holders including knowledge partners like State Agricultural Universities (SAUs), Krishi Vigyan Kendras (KVKs), Indian Council of Agricultural Research (ICAR) Institutes etc. by the State Government to provide single window service/knowledge provider system for the benefit of farming community. Financial support may be provided through States to institutionalize the concept and meeting supplementary developmental activities.

### F.14.2 Project on Climate Resilient Agriculture

Maharashtra government with financial assistance from World Bank has implemented Project on Climate Resilient Agriculture (POCRA) to address the drought related vulnerability in the agriculture sector. The objective is to enhance climate resilience and profitability of smallholder farming system in selected districts of Maharashtra. PoCRA plans to intervene in about 5,142 villages which include drought affected villages in Marathwada region (3,088) and in Vidarbha region (1,122) and 932 salinity affected villages in Purna river basin.

The components of POCRA are:

- Promoting Climate-resilient Agriculture System,
- Post-harvest management and value chain promotion,
- Institutional development knowledge and policies and
- Project Management to cover institutional set-up.

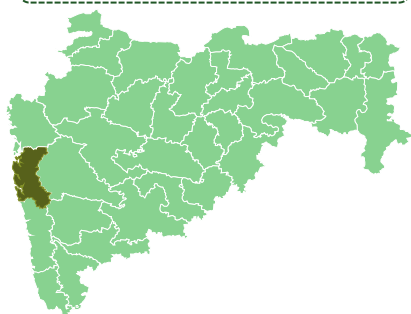


## G. Stakeholder Consultation Details

### G.1 Bitter Gourd and Onion

Raigad, 11/04/19

Village: Alibaug



#### Stakeholder

- Dr Hermann Gmeiner Adivasi FPC. Director Name - Mr Anil Pawar.
- Owned by 277 ST farmers (63 farmers own one-two acres of land and remaining, work on those farms)

#### Observations

- Bitter gourd is sowed in raining season.
- Inter cropping followed - grown along with other vegetables such as onion.
- Produce is supplied directly to the consumers.
- Supply to 10 hotels in Alibaug which buy 40 – 50 kgs of onion
- Transportation is expensive. (Rs 3500/- for Mumbai; Rs.6000 to Pune; Rs 1200-1500 to Alibaug).
- Farmers intend to grow climate resilient varieties but cost is prohibitive
- Prevailing price of gourd given to farmers is Rs 28/- per kg in open market
- No fertilizers used as prices are higher and no subsidy
- Pesticide used not disclosed but used at the rate of five litres per acre and cost of Rs.1200 per litre
- Bitter Gourd Yield is 50-60 tonnes / annum / Ha

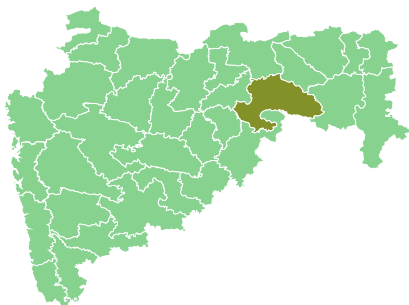
#### Challenges faced by the FPC are:

- Lack of adequate irrigation and hence follow traditional method of collecting rainwater in ponds.
- Power supply is not adequate.
- Solar equipment is too expensive to use.
- High cost of seeds at Rs.1200-1800 per 250 grams with no assurance on quality.
- ST farmers not able to avail bank loan due to lack of collateral and hence borrow from money lenders; government has given land but it cannot be sold
- Basic infrastructure of packing is also not available.
- Branding & marketing of the product is necessary.
- Grievance redressal system not available. Director of FPC needs to visit Ministers & ask for funds. Shortage of funds to expand.
- Cold storage required. Too much heat affects quality of crop.

## G.2 Cotton

Yavatmal, 18/04/19

Village: Sarangpur, Ner



### Stakeholder

- Name of FPC – Joyous Agrivision FPC
- Name of Interviewer – Sachin Baskar Wankhade
- Total members - 222 shareholders & 400 farmers

### Observations

- There is no standalone FPC for cotton. This FPC is for multiple commodities.
- Lack of adequate irrigation system, totally dependent on rainwater, drip irrigation available only in 10 percent area.
- High Cost of seeds & fertilizers.
- Economical condition of most the farmers is very poor. Average landholding size per farmer is 5-6 acres.
- Cotton is directly sold to companies & farmers are paid according to quality & quantity.
- No intercropping practiced in cotton field.
- Farmers can buy seeds, fertilizers and pesticides from the FPC.
- 30 – 40 percent farmers in the FPC adopt organic farming.
- Advanced technologies required for farmers such as cotton plucking automated machines.
- Protective fencing required to stray away wild animals from entering in to fields.

Fertilizer: DAP & Urea; 50 kg / Ha; price of fertilizer is INR 750 to 1000 per 50 kg bag.

Pesticide: Bio-pesticides used; price is Rs 1500 – 2000 / litre.

Yield of Cotton: 1.4 to 1.5 MT per hectare.

The requirements of FPC are:

- High Density Producer Machine,
- Storage facility,
- Seeds processing related machines,
- Transportation facility and
- Marketing of product is needed with branding.

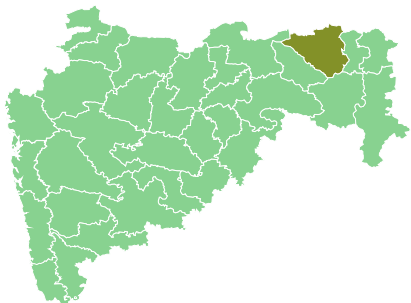


## G.3 Wheat

### G.3.1 Stakeholder - 1

Nagpur, 16/04/19

Village: Kalameshwar



#### Stakeholder

- Name of FPC – Zero Mile FPC, Linga , Nagpur
- Name of interviewer– Rajnikanth Bhailal Patel
- Total no. of farmers – 449

#### Observations

- Lack of adequate irrigational system. Drip irrigation, canal irrigation and sprinkler irrigation available in some areas.
- Extremely harsh weather condition for agriculture.
- Water required is 7-10 litres per acres.
- FPC processing capacity is 2.5 ton per hour However the same is not operational since there is not adequate power supply.
- FPC has grading, cleaning & packing facilities available. User charge is Rs 50/- per quintal.
- Capacity utilization of processing equipment is 4-5 hrs/day.
- Prevailing price of wheat is Rs 1800-2000 per quintal. Crop insurance is there for farmers but no return is provided.
- The farmers are economically very poor in the region.
- 40 percent farmers have Kisan Credit Card
- Crop insurance is given to farmers collectively and no individual insurance given.

Fertilizer: DAP & Urea; 60 -70 kg DAP per acre and 120 kg urea per acre; price of urea 1800 to 2000 per 40 kg bag.

Pesticide: Neem pesticide used at the rate of 1 litre per acre.

Yield: 5 MT per Ha

Crop residue: used for making compost

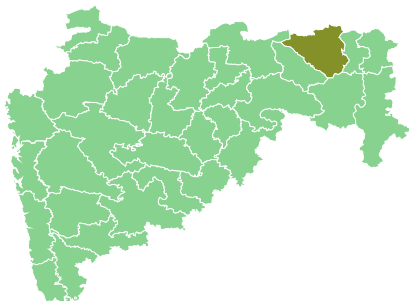
The requirements of FPC are:

- Infrastructure needs to be robust,
- Require Storage facility,
- Steady Power supply,
- Technological advance machines and
- Finance to keep the FPC running.

## G.3.2 Stakeholder – 2

Nagpur, 16/04/19

Village: Kalameshwar



## Stakeholder

- Name of FPC – Shri Krishna FPC , Nagpur
- Name of Interview– Vinod P Gonan
- Total no. of farmers – 377

## Observations

- Lack of adequate irrigation facility, Drip irrigation and canal irrigation available in some areas. Extreme weather conditions
- The farmers are economically very poor.
- Seeds available at the rate of Rs 50 per kg
- FPC has a storage facility of 1200 sq feet.
- FPC has cleaning, grading, graining facility. User rate charges is Rs 100 per quintal
- FPC Processing capacity is 2 MT per hour.
- Prevailing price of wheat is Rs 1800 per quintal.
- 60 percent of the farmers have KCC.
- 200 acres of area under wheat cultivation.

Fertilizer: DAP and Urea; 60 kg per acre urea and 50 kg per acre DAP;

Pesticide: No pesticide used

Yield: 2.5 MT per Ha

Crop residue: Compost

The requirements of FPC are:

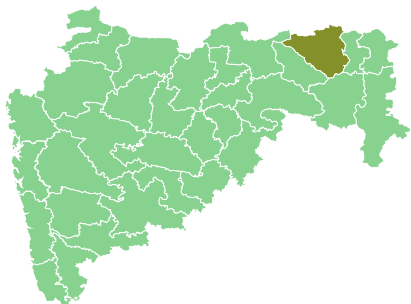
- Infrastructure needs to be robust,
- Require Storage facility,
- Steady Power supply,
- Technological advance machines and
- Finance to keep the FPC running.



## G.4 Chilli (Green)

Nagpur, 17/04/19

Village: Sitapur



### Stakeholder

- Tejaswini SHG, Mahim Women SHG, Sitapur, Nagpur
- Interviewee: Manjusa Zanjade
- Members of SHG – 100 women

### Observations

- The SHG helps women farmers to sell their produce with Tejaswini brand name.
- Intercropping is practiced and major crops cultivated are chilli, wheat and rice.
- Borewell irrigation practiced. Water given on rent to farmers not having borewell.
- Power supply not available for farming.
- 2015 & 2018 chilli production was affected due to worm attack.
- 80 percent female do the farming
- Labour cost is very high.
- Income from farming is less.
- Men are migrating from farming to other jobs and hence farming is mostly done by women.
- No nearby market available and hence women are forced to sell their produce to traders at a lower price.
- Fertilizers & pesticides are used but names not revealed.
- Training related to fertilizers, insecticides, pesticides provided through govt agencies.
- Machine automation that are women friendly are required and training for usage is also required.

Fertilizer: No information available

Pesticides: Neem based pesticides used

Crop residue: Compost in the field

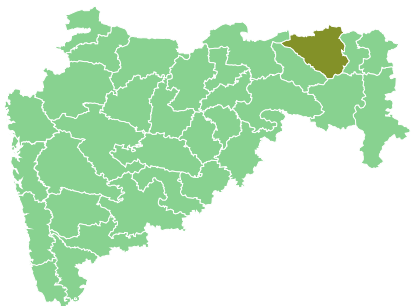
Requirements of the SHG are:

- Transportation facility required,
- Market to sell their produce and
- Additional Training required for new techniques of farming.

## G.5 Chilli (Red)

Nagpur, 19/04/19

Village: Bhiwapur



### Stakeholder

- Name of CBO – Anup Kandap Kendra
- Name of Person – Neelma Suresh Nagaos
- No members

### Observations

- Major source of living is cultivation of chilli & extraction of chilli powder.
- Lack of adequate irrigation facility. Drip irrigation, cannal irrigation and well irrigation available.
- Weather protection is required. Hailstorm & excessive raining spoil production.
- Area under chilli cultivation is 300-350 acres. Per farmers owns about 1-2 acres. Total time required to harvest = 3-4 months.
- On field there is no dryer. It takes 15 days to dry. Loss due to chilli drying 1/4th of total
- FPC has a storage facility of 4 – 6 quintals. FPC has crushing and pounding machine. Processing capacity 8 hours per day.
- Chilli powder is made personally at home & then sold in market
- Average annual production is 60-70 quintal per acre.
- On field there is no dryer. It takes 15 days to dry . Loss due to chilli drying 1/4th of total.
- SHG has bank linkage with ICICI

Fertilizer: No fertilizer used

Pesticide: Not used

Organic Farming: 100 percent

Yield: 6 – 7 MT per acre; price is 120 to 150 per kg for dry chilli

Farm residue: Compost in field

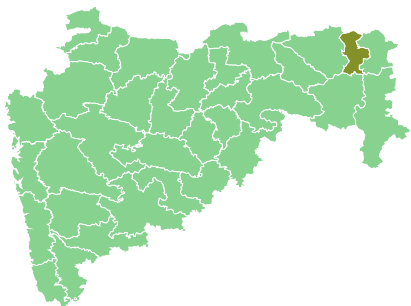
Requirements of SHG:

- Marketing and branding and
- Collective processing required, and this intern require additional land.

## G.6 Rice

**Bhandara, 17/04/19**

Village: Wakeshwar



### Stakeholder

- Name -
- Name of Interviewer- Maruti Prahlad Magkar
- Total No. of farmers = 550

### Observations

- Canal and borewell irrigation adopted. Area has extreme weather conditions
- 90 percent use crop insurance. 20-25 percent are beneficiaries of KCC. 25-30 percent have soil health cards.
- Area under cultivation is 400-500 hectare.
- Average land holding is 1-2 acres
- FPC has rice mill and has Storage facility of 1-2 Ton with processing capacity of 1-2 ton per hr.
- User charge rate is Rs 60 per quintal.
- Average Capacity utilization of processing equipment is 8-10 hrs in season.
- Prevailing price of rice given to farmers is Rs 2000 per quintal.
- FPC has power supply.

Fertilizer: Suphola & urvashi fertilizer; 100 kg per acre; price Rs 2000.

Pesticides: Malathion pesticide: 1 lt per acre; Price 600 per litre

Organic farming: 20 percent

Crop residue: compost

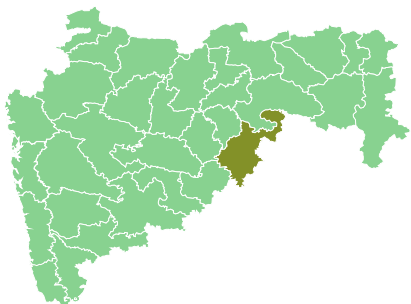
Requirements of FPC:

- Technologically advanced tools required,
- Machineries provided to FPC are incomplete,
- Storage facility is low,
- Additional land required and
- Financial crunch, support required from government.

## G.7 Turmeric

Nanded, 22/04/19

Village: Sawargaon, Ardhapur



### Stakeholder

- Name of FPC – Mahalakshmi, SHG
- Name of person – Jyoti Gaikwad
- SHG members = 10-12 women farmers

### Observations

- Irrigation facility available and drip irrigation in 80 – 90 percent.
- Total area of cultivations 500 acres (biggest turmeric belt in Nanded). Average land holding size is 2-3 acres.
- Market is not available nearby.
- Woods used for boiling the turmeric.
- Drying takes 15 days under the sun
- 100 percent crop insurance
- No KCC and Soil health card
- Farmers do Poultry & dairy farming at their own expense.
- Egg and milk are sold in local market.
- Trader exploitation is high here.
- FPC has 3 – 3.5 MT storage facility.
- User charges rate is Rs 25/kg (rate at which powder is made).
- Loss after drying is 5-10 percent loss;

Fertilizer: DAP and Urea; 125 kg per acre urea, price Rs 1150 – 1200 50 kg

Pesticide: Microcare insecticide; price Rs 700 to 1000 per litre

Yield: 6 – 7 MT per hectare

Crop residue: Compost

Requirements of FPC are:

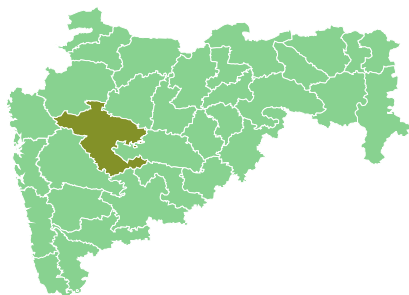
- Marketing of product is needed with branding,
- processing machine is required,
- Infrastructure for storage,
- land to build the storage facility and
- Packing Machine.

## G.8 Soybean

### G.8.1 Stakeholder - 1

Ahmednagar, 26/04/19

Village: Puntamba, Rahata



#### Stakeholder

- Name of FPC – Punyastambh Farmer Producer Company
- Name of person – Kishor Suresh Kadu, Gore Rajdatta Tukaram
- Members of the FPC: 350

#### Observations

- Irrigation facility available in 80 percent of the area under FPC and canal irrigation and drip irrigation available.
- Area under cultivation is 560 hectares. Average land holding size is 2 hectare per farmer.
- Soybean is sold to APMC market. Prevailing price of maize given to farmers is Rs 2800-3600 per quintal.
- All the farmers have KCC, crop insurance and soil health card.
- FPC has storage facility. Processing facility capacity is 2 MT per hour.
- FPC has Gravity separator, Spiral separator, grader, Grinder
- User charges Rs 100 per quintal
- Capacity utilization processing equipment is 180 days

Fertilizer: 50:75:00 NPK; urea rate is Rs 270 per 45 Kg bag; SSP rate is Rs 370 per 50 kg bag.

Pesticides: Neemark Beavearia and Coragen Hamla; quantity used are Neemark,- 1 liter /acre, Beavearia -2 lit /acre, and Coragen-180ml/acre; price Neemark -400Rs/lit, Beavearia-200 Rs/lit and Coragen-560/180ml

Yield: 2.5 T per hectare

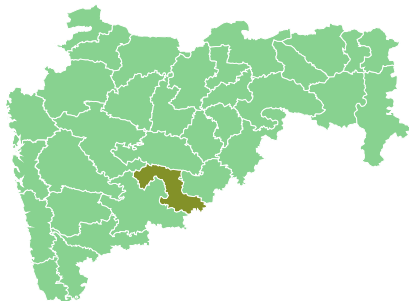
Crop residue: burning in pit

Agrochemicals: Ropicnazol, Hexacanazol types of agrochemicals.

## G.8.2 Stakeholder 2

Osmanabad, 24/04/19

Village: At.Post. Jevali, Lohara



### Stakeholder

- Name of FPO – Navprabha Mahila Prabhag Sangh
- Name of person – Samadhan Jogdand DM
- Total No. - 2758

### Observations

- Lack of irrigation, 100 percent dependent on rain, Challenges faced in production side is climate.
- Water conservation adopted is mulching
- Area under cultivation is 945 hectare. Average land holding size is 3-5 hectare per farmer.
- No storage capacity available.
- Intercropping is regularly practiced.
- 85 percent crop insurance, soil health card and KCC not available.
- Market price are not favourable
- Transportation cost is high
- Post -harvest no storage facility is available.
- FPO does not have any processing or storage facility.

Fertilizer: DAP,Urea,20-10-10,10-26-26,19-19-19; 100-150 Kg per hectare; Rate at which available fertilizer Rs 1250-1500 per bag.

Pesticides: Chemical pesticides; 2 – 5 litter per Ha; price Rs. 1200 – 1500 per litre

Agrochemical: trikaal, avent, eglephos; 2-5 litre per crop per hectare. Rate is Rs1200-200 per litre.

Crop Residue: Composting

Yield: 0.35 MT per Ha

Requirements of FPO:

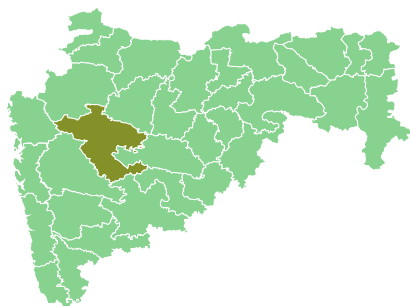
- Storage facility required
- Market price are not favourable
- Transportation facility required

## G.9 Onion

### G.9.1 Stakeholder 1

Ahmednagar, 26/04/19

Village: Mehenduri, Akole



#### Stakeholder

- Name of CBO – Agasti Farmers producer company.ltd.
- Name of person – Mr. Balnath Sonawane
- Total size of FPC – 329

#### Observations

- Area under irrigation is 85 percent Water source is through ridges method.
- Area under cultivation is 260 acres with average land holding of 1 acre.
- Onions are sold in the APMC market in Mumbai.
- No crop insurance and KCC available with farmers but they all have soil health cards.
- No use of solar energy. Training regarding use of insecticides, pesticides are provided by the government.
- FPC has Storage Facility - Godown 56\*30 Feet. No existing processing infrastructure available.

Fertilizer: SSP, 10:26:26, 18:466, potash; price of SSP is Rs 350 per bag, 10:26:26 is Rs. 1400 per bag, 18:466 at Rs.1450, potash 5 at Rs. 900.

Pesticide: Confidor, Actra, Karate; price 3 litres used at rate Rs 400 per litre.

Agrochemicals: M-45, Z-78, Cabrotap. 3 litres used per acre at rate of Rs 800 per litre Average annual production is 35 tonnes.

Crop Residue: Burned in pits

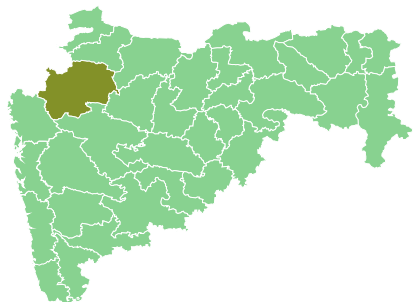
Requirements of FPC:

- Post harvesting storage facility required
- Processing machineries required.

## G.9.2 Stakeholder 2

Nashik, 24/04/19

Area: Nifad



### Stakeholder

- Name of FPC: Gautami CMRC Nifad
- Name of Interviewee: Ms Gayabai Prabhakar Barkale

### Observations

- Source of water are canal, well and bore well.
- Onion water requirement is 30 – 45 mm / Ha
- FPC has 300 members
- Average landholding size is 2 acres
- About 65 farmers have tractors
- Compost / farm yard manure requirement is 20 – 25 tones / Ha
- FPC has just storage facility and has no processing facility.
- Seeds are purchased from agri service centre at the rate of Rs 800 – 900 per Kg.
- Farmers require training for usage of pesticides.
- Prevailing price of onion given to farmers is 4 – 7 Rs per Kg.

Fertilizer: N : P: K , Urea, 120:50:50; price at the rate of 1200 per bag of 50 kg; used at the rate of 5 bags per acre.

Pesticides: Antrocol, M-45, Carate, carbendozin for attack of Fusarium, leaf blight, Downey. Use of Sticky trap and pheromone trap is done

Agrochemicals: Acephate on thrips 50 ml/Ha, Cypermethrin 0.11 lts / acre, Downy mildew 6 gm/litre, Metalaxil

Crop residue: used as cattle feed and fuel

Yield: 280 quintal per Ha

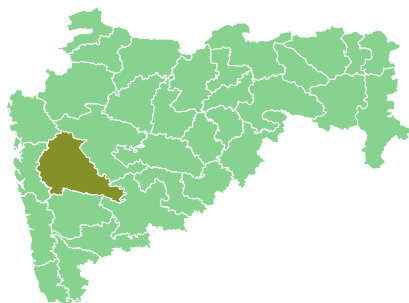
Concerns of FPC:

- Price is not favourable
- Market linkage issue

### G.9.3 Stakeholder 3

Pune, 23/04/19

Area: Junner



#### Stakeholder

- Name of FPC: SHIVNERI LOKSANCHALIT SADHAN KENDRA
- Name of Interviewee: Mrs. Manisha Kale

#### Observations

- Source of water for cultivation are surface water ground water and rain water.
- Irrigation type available are drip irrigation 25 percent and canal irrigation 75 percent.
- FPC has 1000 members.
- The FPC has no storage or processing facility.
- Average land holding size is 1 Ha
- Seeds are purchased from local market or nursery.
- Seeds are available at Rs 1000 to 1500 per kg
- Onion varieties cultivated are red onion wing, Vidalia. Red wing variety is climate resistant.
- Left over pesticide bottles are thrown away or destroyed.
- All farmers have crop insurance and KCC and only 40 percent have soil health cards.
- Onions are sold in local market or Mumbai market.
- Time required for harvest after planting is 6 months.
- Female generating engage in sowing, weeding and harvesting while men mainly focus on marketing, pesticide usage and irrigation process.
- Onions are sold at Rs 3000 to 4000 per quintal.

Fertilizer: Urea, 1846, 1026, potash / organic fertilizer; Used at the rate of 100 kg, 400 kg, 800 kg and 100 kg respectively per Ha; purchased at the rate of Rs. 320, Rs. 1400, Rs 1300 and Rs 1600 per 50 kg bag.

Pesticides: Antracall, Bavistin and Newon; used at the rate of 5 litre per Ha; purchased at the rate of Rs. 400 to 1500.

Crop residue: prepare Farm Yard Manure (FYM)

Yield: 18 tonnes per Ha

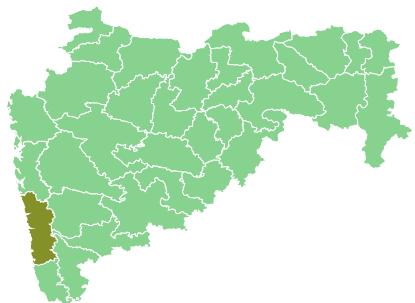
Requirements:

- Cold storage, packaging and grading facility
- Market linkage
- Demonstrate and improved agriculture practices

## G.10 Potato

Ratnagiri, 22/04/19

Area: Vefgaon, Khed



### Stakeholder

- Name of FPC: Satvaji Babu Agro Producer Company
- Name of Interviewee: Mr. Ajay Bhagwat

### Observations

- Source of water for cultivation are well and canal. 40 percent drip irrigation and 60 percent canal irrigation
- FPC has 430 members established in Jan 2013
- The FPC has just storage facility and no processing unit.
- Average land holding size is 2.5 to 5 acres.
- 50 farmers have tractors.
- Seeds are purchased from Punjab, Jalandhar. Varieties of potato cultivated are 1533, ATL, FC-3 FC-5.
- Seeds are purchased at the rate of Rs 3200 per Kg.
- Left over pesticide bottles are buried or recycled.
- About 230 farmers have kisan credit card, 45 have crop insurance and only 10 have soil health card.
- 40 women farmers, 10 SC and 4 ST farmers are engaged in potato farming.
- GRM is available and issues are resolved in 15 days to 1 month
- There were 3 draughts in past 5 years.
- Farmers are trained by KVK, Agriculture Department
- No intercropping is practiced.

Fertilizer: FYM, 10:26:26, DAP, 15:15:0; used at the rate of 11 bags per Ha; purchased at the rate of Rs 1000 per bag.

Pesticides: Profex, Korojan, Hamula, Neuran; used at the rate of 1.5 litre per Ha; purchased at the rate of Rs 800 per litre.

Crop residue: No Response

Organic Farming: None

Yield: 20 Tonnes per Ha

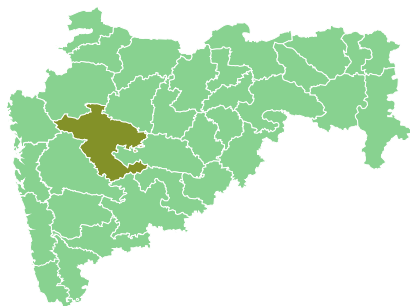
Concerns:

- Fertilizer prize are high and problem in transport
- No storage facility and logistics
- Fixed rate and monopoly in the market.

## G.11 Maize

Ahmednagar, 26/04/19

Village: Chincholi, Rahuri



### Stakeholder

- Name of FPO – Sai Parava FPO
- Name of person – Kadam DC
- Members of FPO – 500

### Observations

- Area under irrigation is 1400 hectare. Canal irrigation is 40 percent, Drip irrigation is 10 percent and other methods is 50 percent.
- Area under maize cultivation is 250 hectare. Average land holding size is 1 hectare per farmer.
- Farmers do contract farming with seed company at Rs. 300 per Kg.
- Prevailing price of maize given to farmers is Rs 1200 per quintal.
- Soil health cards & KCC used by the farmers. Crop insurance is not used.
- FPO has Storage Facility - Godown Available. Processing capacity of 3 tonnes per hour. User rate charges is Rs 100 per quintal. Capacity utilization processing at rate of 8 hours per day.
- Pesticides used as per recommendations. Proper training on use of it provided.
- Challenges faced in production side is pest attack.
- Challenges faced in production side is pest attack.

Fertilizer: zinc phosphate, DAP, urea; Price of DAP is 250 per Kg;

Pesticide: Neem oil; price is Rs 650 per litre

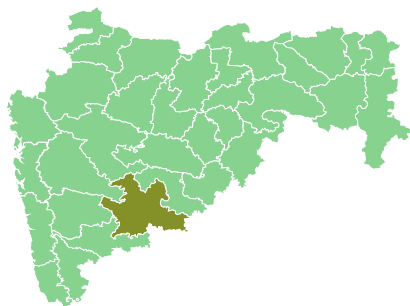
Yield: 8 Tonnes per Ha

Crop Residue: Used as compost

## G.12 Jowar

Solapur, 29/04/19

Village: Vairag, Barshi



### Stakeholder

- Name of FPC – Navi Disha FPC, Malwandi
- Name of person – Umesh Revu Jadhav (CC- Malwandi MSRLM)
- Total size of FPC – 2024

### Observations

- Canal irrigation is 10 percent, Drip irrigation is 30 percent and other methods is 60 percent. Water conservation adopted is mulching.
- Area under cultivation is 6804 hectares. Average land holding size is 2-3 hectare per farmer.
- Intercropping is practices and crops such as sunflower and Safallore.
- Seed purchased from local market.
- Crop is sold in APMC and local market.
- Soil health cards & KCC used by very few farmers. Crop insurance is done by almost all.
- Prevailing price of maize given to farmers is Rs 3000-3200 per quintal.

Fertilizer: Urea, SSP, FYM; Usage is 100 Kg/ Ha; Rate at which available Urea -Rs 300 per 45 kg Bag, SSP-350 Rs 50 kg Bag

Pesticides: 125 ml per hectare. rate of pesticide is Rs 500 per hectare.

Agrochemicals: 125 ml per hectare of agrochemicals used at rate of Rs 2500-3000 per hectare.

Organic Farming: 60 – 70 percent

Yield: 2.5 to 3 tonnes per Ha

Crop Residue: Composting

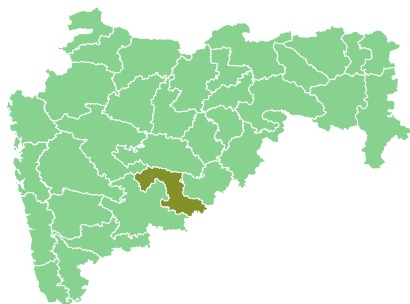
Requirements of FPC:

- Storage facility required
- Transportation facility required
- Agronomical service required

## G.13 Black Gram

Osmanabad, 24/04/19

Village: Javeli, Lohara



### Stakeholder

- Name of FPC – Navprabha Mahila Prabhag Sangh
- Name of person – Altaf Jikre
- Members – 219 SHG & 2167 members

### Observations

- Lack of irrigation facility, 100 percent dependent on rainwater
- Area under maize cultivation is 765 hectares. Average land holding size is 3-5 hectare per farmer.
- Average annual production is 400-600 kg per hectare.
- Intercropping with soyabean crop regular.
- Crop insurance is present, but no complaint redressal system activated in FPC till yet.
- Seeds are purchased from KVK and Local market. 12 – 15 kg per Ha
- Black Gram is sold in local district market
- Water conservation adopted is mulching.
- Prevailing price of maize given to farmers is Rs 5000-6000 per quintal.

Fertilizer: DAP, SSP, Urea; used at the rate of 80 -100 Kg per acre; Price is Rs 1500 per bag

Pesticides: Phorate and Zineb; used at the rate of 1 litre per Ha; Price is Rs 1000-1600 per litre

Yield: 0.4 to 0.6 Tonnes per Ha

Organic Farming: 15 percent

Crop residue: Compost

Requirements of FPC:

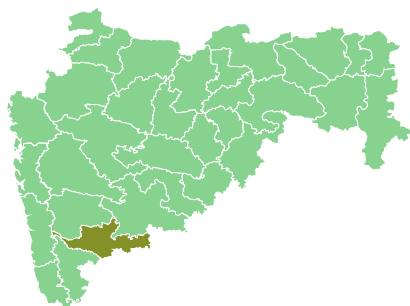
- Storage facility required
- Transportation facility required
- Rates are not favourable

## G.14 Tomato

### G.14.1 Stakeholder 1

Sangli, 20/04/19

Village: Karanjwade, Walwa



#### Stakeholder

- Name of FPO – Varnamai Agro Producer Co.Ltd
- Name of person – Varnamai Agro Producer Co.Ltd.- Ramrao Sampat Patil
- Total size of FPC - 500

#### Observations

- Area under irrigation is 100 percent with 90 percent from drip irrigation. The source of water is open well, bore well & lift irrigation.
- Water requirement for tomato cultivation is 4000 - 6000 cu. meter per hectare or 300 - 400 mm
- Area under tomato cultivation is 150 acres. Average land holding size is 2-5 hectare per farmer.
- Intercropping is practiced with other crops such as Cabbage, Cauliflower, & Leafy Vegetables
- Nursery purchased from Hightech nursery. Rs. 1 per plant.
- Prevailing price of tomato is Rs 6 per kg.
- Training provided to the farmers. Farmers have problem regarding pricing of the tomatoes which is fluctuating as per demand & supply.
- FPC has Storage facility available with capacity of 1000 sq ft work shed.
- Processing facility are vegetable electric dryer - 60 kg per batch, Vegetable cutter with 40 kg per hour & vegetable slicer with 50kg per hour is available as processing infrastructure.

Fertilizer: 10.26.; used at the rate of 50 kg per hectare; Price at rate of Rs 1400 per kg.

Pesticides: Thrips - Confidor a.i.Imedaclopride 23.5 EC, White Fly - Confidor a.i.Imedaclopride 23.5 EC, Fruit Borer - Emamectin Benzoate 5 percent SG, Red mite - OMITE a.i.Propargite 57 percent EC & Thiodicarb 75 percent WP.

Agrochemical: Early Blight -Tricyclozone 75 percent  
Late Bligh -Cymoxanil 8 percent + Mancozeb 65 percent  
Powdery Mildew - dinocap 75 percent or NATIVO 75 percent  
Downy Mildew - Ridomill Gold a.e. metalaxyl 4 percent + Mancozeb 64 percent.

Yield: 150 Tonnes per Ha per year

Crop residue: Composting

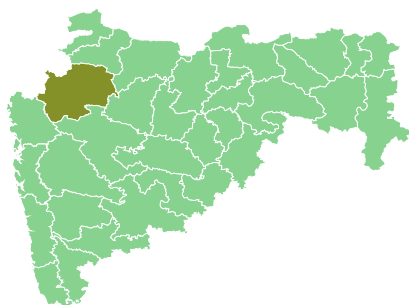
Requirements of FPC:

- Processing facility and rate assurance

### G.14.2 Stakeholder 2

Nashik, 24/04/19

Village: Niphad



#### Stakeholder

- Name of FPO – Gautami CMRC Niphad
- Name of person – Bharti Ishwardas Bairagi
- Total size of FPC - 3650

#### Observations

- Irrigation is through canal, bore-well and well irrigation. Water requirement is 40 – 45 mm. Mulching and drip irrigation is adopted for water conservation.
- 500 – 550 women have their own farm land.
- Average land holding size is 1 – 2 acres.
- 300 farmers belong to the FPC, 65 have tractors.
- Tomato is cultivated in black cotton soil.
- Seedling are purchased from nursery at 0.80 paise per seedling.
- Time to harvest is 2.5 months.
- Prevailing price of tomato is 10 – 20 Rs per kg.
- Tomatoes are sold in local market or mandi.

Fertilizer: 75:40:25, 18:18:10: price at the rate of Rs 435 per bag of 50 kg.

Pesticides: Beetle, caterpillar, white fly and nematodes attack; Kocide 2000, DDT, Chemoparid, carbofuran, monocrotophos are used. Farmers are aware of ferro men trap and sticky traps.

Crop residue: Composting

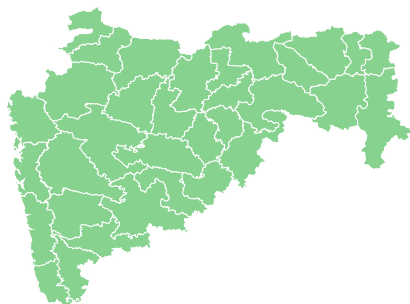
Requirements of FPC:

- Processing facility and rate assurance

## G.15 Brinjal

Sangli, 20/04/19

Village: Karanjwade, Walwa



### Stakeholder

- Name of FPO – Varnamai Agro Producer Co.Ltd
- Name of person – Varnamai Agro Producer Co.Ltd.- Ramrao Sampat Patil
- Total size of FPC - 500

### Observations

- Area under irrigation is 100 percent with 90 percent from drip irrigation. The source of water is open well, bore well & lift irrigation.
- Water requirement for brinjal cultivation is 8000 - 10000 cu. meter per hectare or 600 - 650 mm
- Area under brinjal cultivation is 100 acres. Average land holding size is 2-3 hectare per farmer.
- Intercropping is practices with other crops such as Cabbage, Cauliflower, & Leafy Vegetables
- Nursery purchased from Hightech nursery. Rs. 1 per plant.
- Prevailing price of brinjal is Rs 20 per kg.
- Brinjals are sold in APMC market in Sangli and Ratnagiri and Jaysingpur.
- FPC has Storage facility available with capacity of 1000 sq ft work shed.
- Processing facility are vegetable electric dryer - 60 kg per batch, Vegetable cutter with 40 kg per hour & vegetable slicer with 50kg per hour is available as processing infrastructure.

Fertilizer: 10.26.26, used at the rate of 250 kg/Ha; Price at rate of Rs 1400 per kg.

Pesticides: Thrips - Confidor a.i.Imedaclopride 23.5 EC , White Fly - Confidor a.i.Imedaclopride 23.5 EC , Fruit Borer - Emamectin Benzoate 5 percent SG, Red mite - OMITE a.i.Propargite 57 percent EC & Thiodicarb 75 percent WP.

Agrochemical: Fusarium wilt used at the rate of 1 kg per Ha: Price Rs 1600 per Kg.

Yield: 50 – 60 Tonnes per Ha per year

Crop residue: Composting

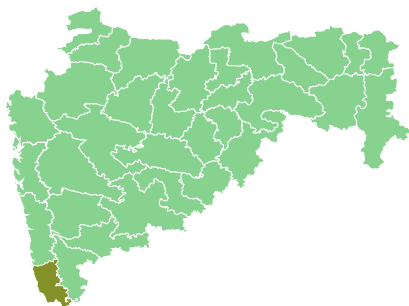
Requirements of FPC:

- Processing facility and rate assurance

## G.16 Paddy

Sindhudurg, 24/04/19

Village: Humaraila



### Stakeholder

- Name of FPC – Agricar Farmer Producer Company
- Name of person – Vaibhav Pawar
- Total size of FPC – 100

### Observations

- Lack of adequate irrigation system, The source of water are open well, bore well & lift irrigation. Rainfall plays an important role. 10 mm water required per day.
- Area under cultivation is 1500-2000 hectare. Average land holding size is 1-2 acre per farmer.
- Seeds are purchased from local nursery at the rate of Rs 300 to Rs 400 per Kg.
- Crop insurance 75 percent, Soil health card 50 percent and 25 percent KCC.
- No Intercropping
- High cost of seed
- Labour not available
- Training Provided to farmers
- FPC has no storage facility & no processing unit available.

Fertilizer: NPK (50.12.12), Urea & DAP; Used at the rate of 110 Kg per acre and 27 Kg / acres of DAP

Pesticide: Used but information not provided

Agrochemicals: Redomil gold available at Rs 500-500 per 1/2 kg

Yield: 5-7 tonnes per hectare.

Crop residue: dry leaves which is put into ground back

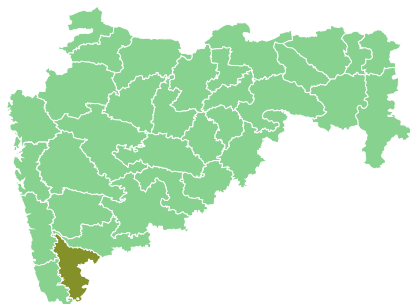
Requirement of FPC:

- Processing, grinding and packaging unit required

## G.17 Banana

Kolhapur, 21/4/2019

Village: Bhadgoan



### Stakeholder

- Name of FPC – Family Farming Producer Company Ltd.
- Name of person – Asitsith Patil
- Total size of FPC - 530

### Observations

- Area under irrigation is 85 percent and source of water is warana river. 10 litre per day per plant water is required for cultivation.
- Area under banana cultivation is 70 acres and Average land holding size is 1.5 acre.
- Raw banana is sold at Rs 8000-10,000 metric tonne & ripened banana is Rs 15,000-20,000 metric tonne.
- Saplings purchased from nearby Nursery at the rate of Rs 13 per plant.
- 15 percent of the farmers have tractors.
- No crop insurance. 40 percent have KCC. Soil health cards used.
- FPC has 20MT cold storage for banana, 1700 sq ft fertilizer go-down. Vacuum packing machine, washing buckets, grading tables, weighing machine. Processing capacity of 4 MT per day. User charges rate are Rs 2 per kg. 70 percent capacity utilization of processing unit.

Fertilizer: Yara Fertilizer; Price is Rs 300-2500 per bag depending on the quality

Pesticide: BVG life sciences pesticides used as 1 litre per hectare available at Rs 1000 per hectare.

Yield: 75 tonnes per Ha

Organic farming: Few farmers adopt

Crop residue: minimal

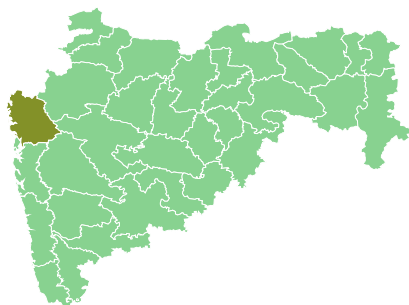
Requirements of FPC:

- Sorting machine, cold press juicer. Infrastructural changes required at large scale.
- Market facility in city.
- Price are not favourable.

## G.18 Okra

Thane, 8/04/19

Area: Angad, Shapur



### Stakeholder

- FPC Name: Mahuli Shethkari Producer Company
- Promoter: Mr. Sudhir Jairam Gadge
- Interviewee / Partner: Mr Rajesh Jairam Gadge

### Observations

- Irrigation is through river water, well and borewell.
- Average landholding size of okra farmers is 2 – 2.5 Ha
- Total area under okra farming is 80 acres.
- Okra is mostly rainwater dependent.
- Seeds are purchased from market at a rate of Rs. 2200 per kg. 4 kg seed is required per acre.
- Only 2 farmers are having tractor in the village.
- FPC has just 4 ton storage capacity and there are no processing or grading machineries in the FPC.
- Farmers are trained by Department of agriculture officials.
- Farmers sell their produce as per demand either in open market or APMC market.
- Farmers have soil health card and crop insurance but no KCC.

Fertilizer: 1818, 1919, urea, compost; price Rs 800 per 50 kg bag.

Pesticide: Neurion, Tymote, Neemer; Used at the rate of 1 litre per acre; purchased at the rate of Rs. 900/ litre.

Yield: 25 tonnes per Ha

Crop residue: Compost

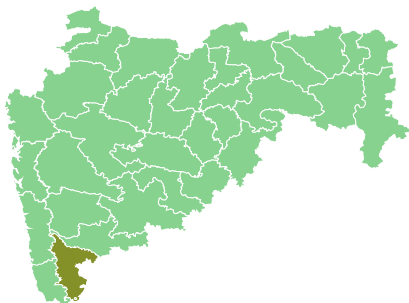
Requirements of FPC:

- Labour cost is high
- Requirement of transportation logistics
- Cold Storage is needed
- Branding and packaging
- Go-down

## G.19 Millet

Kolhapur, 21/4/2019

Village: Bhadgoan



### Stakeholder

- Name of FPC – Vinayak Farms Producer Company Ltd.
- Name of person – Abhijit Davane
- Total size of FPC – 509

### Observations

- Lack of irrigation system, completely dependent on rainfall.
- Area under cultivation is 13450 hectares. Average land holding size is less than 1 acre per farmer.
- No intercropping
- Seeds are supplied by government at Rs 60 per Kg.
- No insurance, KCC and soil health cards.
- Millet is sold to Vasant Dalal Shahji Patil 30 tonnes per month at Rs 2000 per quintal.
- FPC has rental go-down of 5000 Tonnes capacity.
- FPC has processing facilities such as primary cleaning unit. Processing capacity is 1 ton per hour. User charge rate is Rs 100 per quintal. Capacity utilization of processing unit is 30 tons per month.

Fertilizer: Compost is used as fertilizer; used at the rate of 2 tonnes per Ha; Price at Rs 2000 per ton

Pesticides: Not used

Crop residue: Information not provided

Yield: 2 Tonnes per Ha

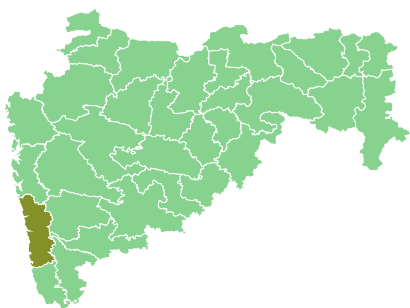
Requirements of FPC:

- Inadequate processing facility
- Marketing and branding

## G.20 Mango (Private Processing Unit)

Ratnagiri, 13/4/2019

Village:



### Stakeholder

- Processing Unit – Konkan Mango Processing Unit, Ratnagiri
- Person interviewed – Ram Chandra Jainta Desai / Amar Desai

### Observations

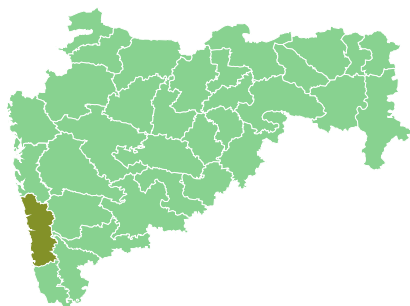
- Processing unit (seasonal) is a private entity and was set-up recently in 2018.
- It produces mango pulp from mix of Alphonso and other varieties of mangoes.
- Contractual labour in the FPC of 13-15 people.
- Mangos are purchased from middle man since farmers are not able to supply the desired quantity of mangoes.
- Instant processing is done.
- Storage facility is 1000 tonne
- The unit has aseptic packaging unit.
- Decanter centrifuges, storage tank, chambers and chillers are the machineries in the processing unit
- Water requirement is met through borewell inside the unit premises.
- DG set is also available for power backup
- It was informed that only mangoes from Konkan are to be called Hapus (also known as Alphonso mango).
- The districts included are Sindhudurg, Ratnagiri and Raigad.
- The unit has consent from the Maharashtra Pollution Control Board.
- Factory license available
- FSSAI license is available.

## G.21 Cashew Nut

### G.21.1 Stakeholder 1

Ratnagiri, 13/4/2019

Village: Goankhadi



#### Stakeholder

- Name – Tejaswini Prakriya Unit, Kheravse, Lanja, Ratnagiri
- Person interviewed – Ms. Samuradhi Vichare
- Members: 30

#### Observations

- Irrigation is through well and bore-well. Source of cultivation is good as river flows nearby.
- Area under cultivation is 500 acres
- Land holdings is 1 – 2 acres.
- Saplings are purchased from government nursery at Rs. 80 – 100 per
- Per tree yield is around 25 kg. Approximately per person has 500 trees.
- Time required to harvest after planting is 3 years.
- The farmers get very low price for the produce. No proper retailer is available to sell their produce.
- Farmers have crop insurance, KCC and soil health cards.
- Cashew nuts are sold in local market, nearby hotels, through exhibitions and agents. Sold at the rate of Rs 130 per Kg.
- FPC has storage facility 3 tonnes for raw cashew and 2 tonnes for final product. Processing facilities are hand cutter, boiler, drier and weights. Processing capacity is 1 – 2 tonnes per month. User charge rate is Rs 35 per Kg.

No Fertilizer and Pesticide is used.

Farm residue: Compost

Yield: 25 Kg per tree

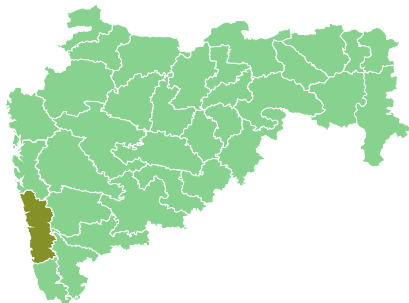
Requirements of FPC:

- Storage facility is required.
- Branding & marketing of produce.
- Additional machineries required for expansion.
- Transportation costs are too high to target far areas to sell produce.

## G.21.2 Stakeholder 2

Ratnagiri, 13/4/2019

Village: Dhamandevi Mohalla



### Stakeholder

- Name of FPC – Chandika Mahila Bachat Gad
- Person of interview – Sneha More
- Total no. of persons - 120

### Observations

- Irrigation is through well and borewell. Water requirement is 40 litre per day.
- Landholding size is 1 – 2 acres per farmer.
- Saplings are purchased from government nursery. Two varieties of cashew nuts are grown namely vanguard 4 and vanguard 7 purchased at Rs 100 and Rs 140 respectively.
- Cashew nuts are sold in pune through agents. Price is Rs 120 – 130 per Kg vanguard 4 and Rs 140 per Kg for vanguard.
- 100 percent crop insurance, 50 percent soil health card and none have KCC.
- FPC has equipment such as boiler, drier and cutter. Processing capacity is 100 – 150 Kg per day.
- Storage capacity is 25 tonnes with processing capacity of 100kg/day & 150/kg cutting
- Power requirement is 180 units for drier and complete requirement is 220 units for 20 days. Power bill comes around Rs. 2000 – 2500 per month
- User charge rate is Rs 50 per Kg with packaging.

Fertilizer: Not used

Pesticides: Not used

Crop residue: Compost

Yield: 30 T per hectare

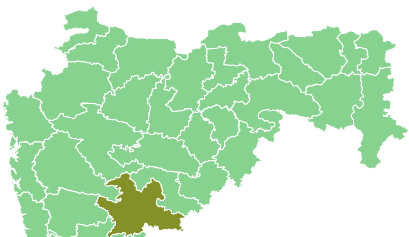
Requirements of FPC are:

- Capacity enhancement needed.
- Funds required to expand.
- Cashew nut is outsourced for polishing
- Marketing of product is required
- Storage facility is required.

## G.22 Pomegranate

Solapur, 27/4/2019

Village: Kadlas



### Stakeholder

- Name of CBO – Saksham Mahila Prabhgh Sangh kadlas.
- Name of person – Mr. Krunal Mahadev Patil
- Total size of FPC - 1550

### Observations

- Irrigation is through water ponds and borewell. 90 percent through drip irrigation. Water conservation is also practiced through mulching.
- Area under cultivation is 516 hectares. Average land holding size is 1 hectare per farmer.
- Sapling purchased from local nursery at Rs 20 per plant.
- It takes 2 years from planting to get yield of pomegranate.
- Prevailing price of pomegranate is Rs 90 to 100 per Kg (residue free) and Rs 30 to 60 with residue.
- 25 – 30 percent farmers have crop insurance, KCC and soil health card.
- Soil having high lime stone content are not favourable for growth of pomegranate tree.

Fertilizer: NPK 10;26;26, 19;19;19, 15;15;15,DAP 18;46 SSP 16 percent, MOP 60 percent,05234,0050,13045,134013 at 1 Ton/Hectare. Price 1200 – 1400 per bag.

Pesticides: Not used in recent years.

Yield: 10 Tonnes per hectare

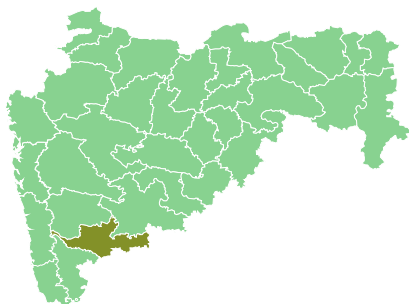
Requirements / constrains:

- Lack of processing unit and storage facility.
- Price is not favourable
- Transportation cost is high
- Regular pest attack

## G.23 Grapes

Sangli,

Village: Tasgaon



### Stakeholder

- Name of FPC – Suvidha Lok sanchalit Sadhan Kendra, Tasgaon
- Name – Mr.Dattajirao Kokate ,Manager,Suvidha
- Total size of FPC - 650

### Observations

- Irrigation is by Potable water. 85 percent is through drip irrigation. water conservation measures through Farm ponds, mulching by raw husks
- Area under cultivation is 500 hectare. Average land holding size is 1.5 acre per farmer.
- Saplings are purchased from nursery at Rs. 20 per plant.
- Grapes are sold at APMC market at Tasgaon. Prevailing price of grapes is Rs 35 to 45 per kg.
- Time required to harvest is approximately 2 years.
- All have crop insurance and 20 percent have KCC and soil health cards.
- FPC has taken cold storage on rent.

Fertilizer: DAP,MOP,0:52:34,12:32:16,19:19:19 - 700 to 1000 kg/hectare at rate from Rs.500 to 3000 per 25 kgs.

Pesticide: Diethane M-45, Blue Copper Z-78. Quantity used 75 to 150 kg/hectare.

Organic Farming: Not adopted

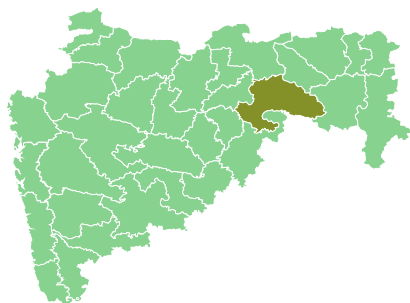
Yield: 15 Tonnes per hectare

Crop residue: compost

## G.24 Tur Dal

Yavatmal, 18/4/2019

Village: Ner



### Stakeholder

- Name of FPC – Tejaswini Dal Mill SHG. Name of person – Neelama Raut
- Total farmers = 550

### Observations

- Pipe irrigation is 75 percent & drip irrigation at 25 percent. Per season 4-5 times water is sprayed on the fields.
- Land holding size is 3 – 4 acres per farmer.
- Seeds are purchased from KVK at Rs 250 / 2 kg bag.
- Produce is sold through exhibitions and market through agents.
- 90 percent have crop insurance, 75 percent have soil health card and 25 percent have KCC.
- FPC has storage facility of 10 Ton capacity
- FPC has processing infrastructure such as Grader , Dal mill, Polisher , Packing machine , Weights machine. Processing capacity is 6 – 7 hrs per day. user charger rate is Rs 100 per quintal.
- Solar energy is used in FPC in the form of Solar dryer & solar motor

Fertilizer: Complex NPK 10-26, 18-10,20-13Urea & DAP; used at the rate of 50 Kg per Ha; Price is 1000-1250/50Kg bag

Pesticide: BGF, Neem & cow urine used as pesticides. Quantity of pesticides used is 1/2 litres / hectare available at rate Rs 1200-1500 per litre. Sticky traps are used.

Organic farming: 5-10 percent

Yield: 4 Tonnes per Ha

Crop residue: Compost

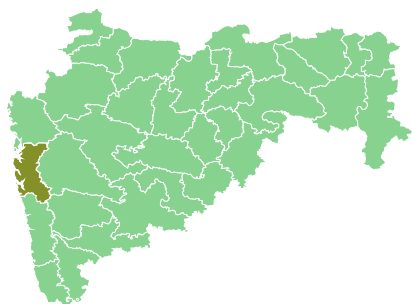
Requirements of FPC:

- Financial support required
- Marketing of product required
- Cold storage required

## G.25 Gram

Raigad, 12/4/2019

Village: Indapur



### Stakeholder

- FPC name – Somjai farmers Producers Company
- Director name - Mr Pramod Dalvi
- Total no. of farmers – 502

### Observations

- Area is covered under irrigation but no water. All water is dried up. 50 percent canal irrigation & 40 percent other methods for irrigation.
- Average land holding is 1 – 2 acres.
- Intercropping is done with dal pulses and vegetables.
- Farmers use self - seed from past produce.
- Prevailing price of gram is Rs 80 to Rs. 100 per Kg.
- All farmers have crop insurance, soil health card and KCC.
- FPC has storage facility of 100 tonnes.
- FPC has grading, Packing & sorting facility available. Not in continuous operation.

Fertilizer: Not used

Pesticide: Neem based pesticides used in amount 1 litre per acre which price of Rs 700-800 per litre

Yield: 90 to 100 tonnes per Ha per annum.

Crop Residue: Compost

Requirements of FPC:

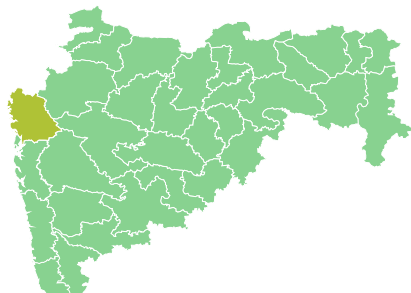
- Cold storage required for mangoes
- Advanced processing machine
- Power and water requirement.
- Branding required

## G.26 Sapota

### G.26.1 Stakeholder 1

Palghar, 9/4/2019

Village: Dhanu



#### Stakeholder

- CBO Visited – Maharashtra Rajya Chiku Utpadak Sang
- Director name - Mr Vinayak Bari and Member Secretary – Mr. Milind Nhaphna
- Total members – 300 members

#### Observations

- Irrigation is done by bore-well, well and canal irrigation. Only 5 percent area is under canal irrigation. Water requirement for sapota is 100 litres per day per tree. Sapota farming is completely dependent on rain.
- Area under sapota cultivation in Dhanu is 7427 Ha Average land holding is 10 – 12 acres.
- No intercropping is practiced since the tree is dense and will not support.
- Farmers have crop insurance, soil health cards and KCC
- Saplings are purchased mostly from government nursery at a price of Rs 60 per graft.
- 50 percent farmers have tractors.
- 90 percent are women labourers in Sapota farming.
- Sapota requires calcium rich soil and alluvial black soil.
- At present there are no proper FPC with cleaning grading and packaging for Sapota.
- Solar energy is used for drying Sapota to make chips.
- There is a need to set-up processing facilities for Sapota since it's a very perishable commodity. At present some women in the village make Sapota Chips, chocolate and pickle but there is lack of branding and marketing support from the government.
- Sapota tree require rejuvenation to get better yield but labour cost is high, so farmers generally don't rejuvenate the tree by cutting the old barks.
- Price for Sapota is done by open market auction.
- Sapota grading is done based on no. of fruits per 10 Kg. Sold in Mumbai and Delhi market.

Fertilizer: Organic fertilizers such as sterameal and oilcake; used at the rate of 10 kg per tree each; Price is 25,000 to 30,000 per Tonne.

Pesticide: seed borer and bud borer are the pest that attack Sapota and it is controlled by IPM i.e., use of big red ants.

Agrochemical: Trichoderma and pseudomonas bacteria are used to control phytothora fungal infection. Used at the rate of 100 – 200 gm per tree

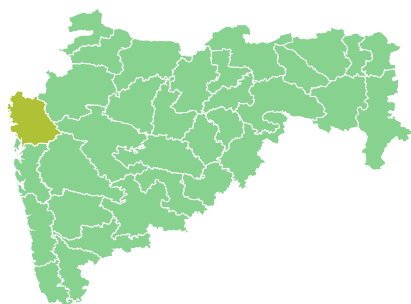
Yield: 10 Tonne per hectare; price Rs 7 – 10 per Kg

Crop Residue: broom and dumped; due to latex problem the leaves are difficult to compost.

## G.26.2 Stakeholder 2 (Private Processing Industry)

Palghar, 9/4/2019

Village: Bordi



### Stakeholder

- Food Processing Unit: Arya's Natural Chipzee
- Name of the partner: Mr Sidharth Patil and Mr. Pranil Chowdhary and Mr Aniket Chowdhary

### Observations

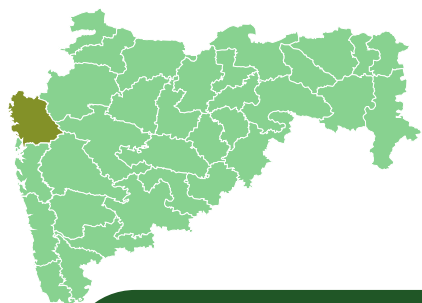
- Area of the industry is 6000 sq.ft and type of industry is small scale.
- Raw material used for processing are mango and Saporta.
- Processing capacity is 50 Kg per day.
- Fruits are mostly bought from own field via truck
- Price of Saporta paid to the farmer is Rs. 20 / kg.
- Cleaning is done with water wash
- Activities done in the industry are cleaning, manual peeling, cutting, deseeding
- Saporta is ripened for 96 hr after plucking using ethylene ripening.
- Power consumption is 8 Hp and solar dryer for drying the Saporta pieces to make chips.
- Plant has D.G back up rating is 25 KVA.
- Source of water is borewell
- No effluent for treatment
- Sewage is handled in septic tank.
- No of persons employed are 14 women and 1 man. All belong to ST category.
- Solid waste generated is Saporta skin and seeds. Mostly it is composted.
- Products are Saporta Chips, Saporta Powder, Saporta Pickle and Mango slices.
- The processing unit has FSAAI license and factory license.
- Government gives 80 percent subsidy for modern techniques but Branding and Marketing of product is required.
- Every commodity is unique and tailor made solution are required.

## G.27 Market / Traders / Retailers

### G.27.1 Stakeholder 1 (APMC)

Mumbai, 10/4/2019

Area: Vashi



#### Stakeholder

- Name of Wholesale Market – Mumbai Agri Produce Market Committee, Mumbai
- Name of interviewee - Mr K.R. Powar ( PRO & Asst Secretary )

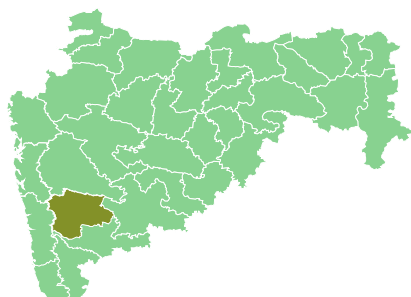
#### Observations

- The market was set-up in 1975 and it handles all type of fruits and vegetables. Market is spread in an area of 70 hectare. Leas period is 60 years.
- Prices of the commodities are displayed in big screen at the entry gate. Also, the prices are listed on the website.
- Market timing is 7 am to 2 am.
- Farmers and mostly traders bring commodities to the markers. The market caters all over India.
- Cold storage facility is available but not yet operational.
- No grading and packaging facility available.
- No preservatives are used.
- Market has power connectivity
- Weighing facility is available.
- Female members & STSC staff members are available
- Price of commodity is decided on the demand & supply of the produce.
- DG Set is available only in head-office.
- Police station is available inside the market. Each market has departments & grievance redressal system is also operational. Grievances are resolved in a weeks' time.
- Drinking water and separate toilet facility available for male and females.
- No waste water treatment facility.
- Additional land required to expand capacity of market place and new advanced machineries required.
- Market has bank facility
- Food quality checks are done.
- Solid waste management is not adequate, and market is not clean.
- Export is done from the market to Japan, U.S.A, Australia, South Korea, New Zealand, China, Russia, Kazakhstan and Mauritius.
- Farmers having 1 – 2 Ha land holding can register for export in the market. 80 percent of the produce can be exported and remaining is sold in domestic market.
- For exports, field audits are conducted, audit duration varies from commodity to commodity and every commodity has different registration period e.g. okra farmer must register every year and mango farmer registers in every 5 years
- This year around 20,000 farmers have registered for exports. Farmers and new entrepreneurs are training for better quality produce and provide a platform for interaction between farmers and entrepreneurs.
- Farmers are free to supply in any season.
- As per special requirements of export country, post-harvest treatment is given to fruits and vegetables.
- Final product reaches consumer with PUC code and farmer code and hence can be tracked.

## G.27.2 Stakeholder 2 (APMC)

Satara, 3/5/2019

Area: Phaltan



### Stakeholder

- Whole sale Market: Agriculture Producer Market Committee, Phaltan
- Interviewee: Mr Shankar Sarjerao Sonwalkar (Secretary Phaltan APMC)

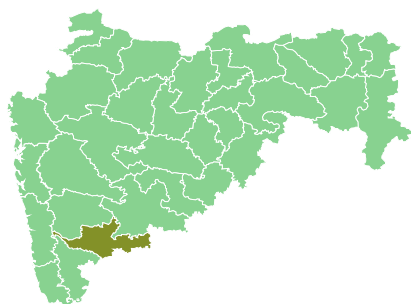
### Observations

- Market was set-up in 1952 and total land holdings is 17.56 Ha Land ownership is with ULB.
- Commodities handled are Wheat, gram, jawar, bajra, maize, onion, fruits, vegetables, sheep-goat, cattle, fodder and forage.
- Rate of lease is 0.50 / sq,ft/year deposited in DCC bank.
- Market is open 6 days in a week except Monday.
- Fruits and vegetables are handled from 6 am to 10 am and grain market from 11 am to 5 pm.
- The market has ticker board and Market Information Display board.
- The market caters 128 villages. Village road is not good.
- Fruits and vegetables handled are pomegranate, potato and onions.
- The market does not have cold storage facility.
- Market use ethylene to ripen mangoes and banana. The quantity used in 1000 ppm.
- The market has power connection and facility for weighing of goods.
- The market has 19 elected members and includes 2 females.
- Allotment of space is on first cum first basis and space is free of cost to sellers.
- Price of commodities are decided by auction and displayed in large ticker board.
- Solid waste is collected by APMC and disposed at municipal dump yard.
- Waste water is discharged to RCC gutter pipeline.
- GRM is available and issues are resolved in the same day.
- Market has a bank within the premises.
- The marker has following requirements:
  - Cold storage and storage structures for onion
  - Separate area for fruits and vegetables
  - Cleaning and grading machines
  - Additional area for expansion.

### G.27.3 Stakeholder 3 (Private Retailer)

Sangli, 4/5/2019

Area: Wai



#### Stakeholder

- Retailer: Parvin Kumar Kantilal Jain
- Retail run by Regional Municipal Corporation

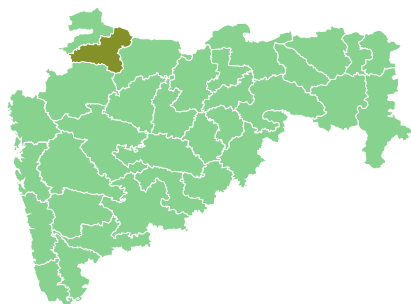
#### Observations

- The retail is under local Authority and the commodities handled are Turmeric Soybeans and Rajma.
- Total land holding size is 30 x 40 sq.ft.
- Price is decided by open auction and price is displayed in the notice board.
- Buyer arrange their own mode of transportation.
- Complete area is used as storage and there is no cold storage facility.
- No packaging facility available
- Retailer has power facility and weighing facility.
- The market has 10 workers, and all are women.
- About 40 – 50 women sellers approach the retailer.
- About 30 – 40 SC sellers approach the retailer.
- The retailer has FSSAI License
- No food quality testing provision is available with the retailer.
- Retailer face storage problems.
- The retailer does not have a Grievance Redressal Mechanism

### G.27.4 Stakeholder 4 (Trader)

Dhule, 6/5/2019

Area: Dhule



#### Stakeholder

- Trader Company: Jitendra Traders
- Mr. Bhika R. Baviskar

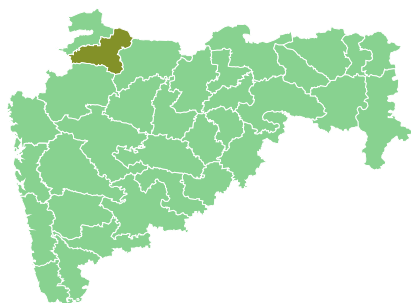
#### Observations

- The trader company was established 20 years back.
- The commodities handled are wheat, maize, bajra and jawar.
- Total land holding is 150 sq.ft and is APMC shop
- Rs. 1 lakh has been deposited and Rs 750 per month is the rent.
- Quantity of commodity handled is 25 Tonnes on daily basis.
- CBO / FPC are about 10 – 15 km far and commodities are brought to the company mostly via tractors
- The trader has two go-downs and does not have cold storage.
- The trader has moisture meter, polishing machine and grading machine and electronic weighing machine.
- Rejected material is feed as cattle feed.
- No women and ST farmers approach the trader.
- Price is decided by open auction and displayed in board.
- The trader has about 8 workers.
- The trader is in need of cold storage facility.
- The trader has power supply.

### G.27.5 Stakeholder 5 (Retailer)

Nashik, 6/5/2019

Area: Market Yard, Nashik



#### Stakeholder

Retailer: Dyaneshwar Laxman Vanmali

#### Observations

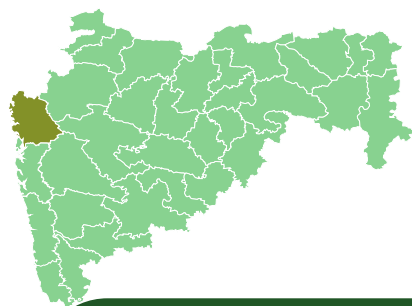
- The retail was set-up in 1974.
- Total land holding is 300 sq.ft
- Commodities handled are chilli, ginger, brinjal, carrot
- Lease deposited to APMC is Rs 12,000 per month.
- Commodities are brought by farmers via truck or auto.
- Retailer does not have space for storage and does not have cold storage facility. Also, there is no packaging facility.
- Quality check is by visual appearance freshness, colour size etc.
- Price of the commodity is fixed by auction.
- Waste generated is managed by APMC
- There are 4 workers in retail shop.
- GRM is available with APMC and the issues are resolved on the same day.
- Due to increased temperature vegetable get spoiled or the quality deteriorates.
- The retail does not have any quality testing equipment.
- The retailer faces theft issues.

## G.28 Goatery / Slaughter House

### G.28.1 Stakeholder 1(BMC Slaughter House)

Mumbai, 10/4/2019

Area: Deonar



#### Stakeholder

- Name of Slaughter House – Deonar Abattoir , Deonar, in the eastern suburb of Mumbai, India.
- Name of interveiwer - Mr Yogesh Shetje (GM)
- Name of Promoter - Brihanmumbai Municipal Corporation (BMC)/ Municipal Corporation Greater Mumbai (MCGM)

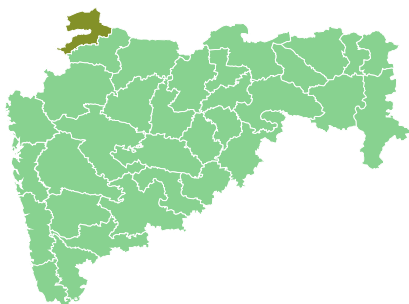
#### Observations

- Slaughter house area is 64 acres. Only Mumbai market is catered.
- Slaughter house capacity is 6000 heads of sheep / goat, 300 buffalo & 200 pigs
- The facility works in 2 shifts of 8 hours each.
- The facility does not have any processing unit and hence runs at a lower capacity utilization level.
- The facility is informed to have valid consent from the Pollution Control Board
- Quality checks for the facility is done by HACCP (Hazard Analysis Critical Control Plant)
- No grading of goats is done. Good hygiene is maintained. All the modern method to handling goat is present.
- Slaughter house has storage capacity of 24,000 goats in stable.
- Meat is kept in chilling plant with no preservatives for 3-4 days.
- Source of Power is through Electricity board & DG sets are available. Municipal corporation provides water supply.
- ETP available with a capacity of 1.3 MCD
- Solid waste generated from slaughter house is reused for trade. Solid waste is managed through Bio metration plant of 15 MT After slaughter waste (if any) can be used as pesticides as well.
- Odour management measures are taken by use of bio-methan. Pest control dept. of municipal Corp controls it.
- Animals are accepted /rejected as per Slaughter House Rules, 2001. It can be rejected before slaughter & after slaughter
- Animals are bought to the facility by villagers / traders and the meat is sold to shopkeepers in Mumbai
- Slaughter house purchase animals from Individual licence holders.
- Animals reach the slaughter house mostly by trucks.
- Buffalo meat is directly sold by the slaughter house where as goat and sheep meat are sold to shopkeepers.
- Total no. of employees is 350 of which 50 percent are on government pay role & 50 percent on contractual role.
- Slaughter house privatization is suggested but employees are not willing to privatize.
- Processing unit expansion is required.
- New laws are difficult to maintain.
- Grievance redressal mechanism is available, and complaints are resolved in 1 – 2 days.
- Female employees are very less at present the strength is 10 and mostly does security works, veterinary doctor.
- ST and SC employees are also present in the slaughter house.

## G.28.2 Stakeholder 2 (Goat Rearing Farmer)

Nandurbar, 22/4/2019

Village: Akkalkuwa



### Stakeholder

- Name of the GRC: Ranikajal Community Managed Resource Centre
- Interviewee: Mrs. Rita Manohar Padvi
- Members of GRC: 2056

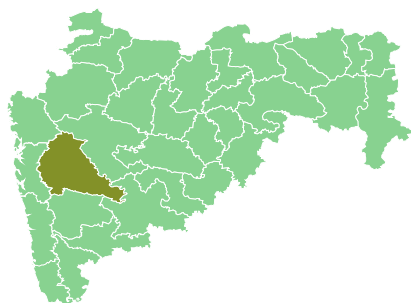
### Observations

- Mostly farmers have goat shelter near their house.
- Out of 670 female farmers engaged in goat rearing 88 are from SC category and 582 are from ST category.
- On an average farmer keep 10 goats.
- Breed of goat reared are Osmanabadi and Rural breeds.
- Farmers buy goat breed from local market or Khetiya in Madhya Pradesh
- On an average a baby goat is purchased at Rs 4000 to Rs 7000
- Farmers take their goat for grazing in forest area out of the village.
- On an average goat require 3 – 4 kg of green fodder and 4 – 5 kg of dry fodder
- Farmers give crushed grain as food supplements to goats. It is purchased at the rate of Rs 20 per kg.
- Goat require 3 – 5 liters of water in a day.
- On an average a goat weigh around 12 – 15 kg.
- A goat gives around half litre of milk in a day.
- Goat milk is sold at Rs 30 per litre
- Goat meat is sold at Rs 400 per kg.
- PDR / FMD / HS / BQ and Enterotoxima are the vaccines given to goat and is available at Rs 15 for a goat and they are vaccine annually.

## G.29 Pesticide Residue Testing Lab

Pune, 04/6/2019

Village: Akkalkuwa



### Stakeholder

- Pune Residue Testing Lab
- Mr Neetin Phulsundar (Analytical Chemist)

### Observations

- Only two government pesticide testing laboratories in Maharashtra i.e., in Nagpur and Pune.
- Pune lab test 56 molecules out of 293.
- No test for regular commodities, only organic commodities are tested particularly fruits vegetables and grains.
- Only some pesticides and insecticides are promoted.
- Testing is limited to the presence of pesticide and not for the quantity.
- These labs don't come under FSSAI and hence don't follow their regulations.

### Recommendation / Suggestion

- It was suggested that random samples from market can be collected by FDA and Health departments under FSSAI and the same shall be send to the lab for testing.
- There are missing linkage between all the govt departments. There should be a common link & work pattern within Agricultural dept, FSSAI. Health dept etc.
- Reliability of organic commodity to be really organic is uncertain.
- Reliability should not be limited to few certifications bodies & their two liner certificates.
- As per the views of the testing officer, Reliance fresh and star bazar never test pesticides and insecticide levels by themselves. They mostly ask the supplier or the farmer to get it tested.
- Customer also doesnot ask for pesticides or insecticide residue levels and hence awareness creating among consumers is necessary.

### G.30 List of CBOs Consulted

**Table 88: List of CBOs Consulted**

| S. No. | Commodity Name   | Name of the FPC                          | Address of the FPC                            | Shareholders         | Name of the Promoter(s)/Partner(s)                     | Address of the FPC                            | Contact No of FPC                    |
|--------|------------------|------------------------------------------|-----------------------------------------------|----------------------|--------------------------------------------------------|-----------------------------------------------|--------------------------------------|
| 1      | Saporta          | Maharashtra Rajya Chiku Utpadak Sang     | Dhanu, Palghar                                | 300                  | Mr Vinayak Bari                                        | Dhanu, Palghar                                | 976655522                            |
| 2      | Bitter gourd     | Dr Hermann Gmeiner Adivasi FPC           | Alibaug, Raigad                               | 277                  | 5 Board Members                                        | Alibaug, Raigad                               | 9260478499                           |
| 3      | Gram             | Somjai farmers Producers Company         | Indapur, Raigad                               | 502                  | 10                                                     | Indapur, Raigad                               | 8446720046                           |
| 4      | Cashew Nut (SHG) | Chandika Mahila Bachat Gat               | Sheer, Tombore wadi, Ratnagiri                | 120                  | Mrs Sheha More                                         | Sheer, Tombore wadi                           | 7588573047                           |
| 5      | Cashew Nut (SHG) | Tejaswini Kaju Packaging Unit            | Ratnagiri                                     | 30                   | Mrs Samuridhi                                          | Khorvese Conja Ratnagiri                      | 9423910927                           |
| 6      | Wheat            | Zero Myle FPC                            | Kalameshwar, Nagpur                           |                      | Me Rajinikanth Bhailal Patel                           | Kalameshwar, Nagpur                           | 9579207551                           |
| 7      | Wheat            | Shree Krushna FPC                        | Kalameshwar, Nagpur                           | 377                  | Mr Vinod P Gohar                                       | Kalameshwar, Nagpur                           | 7875007261                           |
| 8      | Chillies         | Tejaswini SHG                            | Sitapur Nagpur                                | NA                   | NA                                                     | NA                                            | NA                                   |
| 9      | Paddy            | Lokmanas FPC                             | Wakeshwar, Bhandara                           | 13 committee members | Mr Maruti P Maskar                                     | Wakeshwar, Bhandara                           | 8605628356 / 8806245824              |
| 10     | Turmeric (SHG)   | Mahalakshmi SHG                          | Sawargaon, Ardhapur, Nanded                   | 10 members           | Mrs Jyoti Gaikward                                     | NA                                            | 8380848600                           |
| 11     | Chillies         | Anup Kondap Kendra                       | Bhiwapur Nagpur                               |                      | Mrs Neelema Suresh                                     | NA                                            | 9145411938 / 9390864647              |
| 12     | Cotton           | Joyous Agrivission FPC                   | Sarangpur, Ner, Yavatmal                      | 222 shareholders     | Mr. Sachin Baskar Wankhade                             | Sarangpur, Ner, Yavatmal                      | 6766246063 / 7776032966              |
| 13     | Tur              | Tejaswini Dal Mill (SHG)                 | Ashoknagar, Ner, Yavatmal                     | 11                   | Mrs PushpaTai Geda                                     | Ashoknagar, Ner, Yavatmal                     | 9049463743 / 9049615324              |
| 14     | Rice             | Bhatsa Shetkari Producer Company Limited | Shapur Thane                                  | 300 members          | Mr Rajesh Jairam Gadke                                 | Shapur Thane                                  |                                      |
| 15     | Jowar            | CLF Seva                                 | Dhanje, Nandurbar                             | SHG 17 members       | NA                                                     | NA                                            | NA                                   |
| 16     | Maize            | CLF Pragati                              | Varfadya, Nandurbar                           | 140 SHG              |                                                        |                                               | 9420326340                           |
| 17     | Black Gram       | Navprabha Mahila Prabhag sangh           | At.post.Jevali (N) Tq. Lohara Dist. Osmanabad | 219 SHG 2167 member  | President: Shashikala Chavale Secretary- Minakshi Mali | At.post.Jevali (N) Tq. Lohara Dist. Osmanabad | Telephone No.: Mobile No.:9970932012 |
| 18     | Soybean          | Navprabha Mahila Prabhag sangh           | At.post.Jevali (N) Tq. Lohara                 | 219 SHG 2167 member  | President: Shashikala Chavale                          | At.post.Jevali (N) Tq. Lohara                 | Telephone No.: Mobile                |

| S. No. | Commodity Name | Name of the FPC                                     | Address of the FPC                     | Shareholders | Name of the Promoter(s)/Partner(s)                                                                                                                    | Address of the FPC                     | Contact No of FPC                            |
|--------|----------------|-----------------------------------------------------|----------------------------------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|----------------------------------------------|
|        |                |                                                     | Dist. Osmanabad                        |              | Secretary-Minakshi Mali                                                                                                                               | Dist. Osmanabad                        | No.:9970932012                               |
| 19     | Paddy          | Agricart FPC                                        | Humarmala, Sindhudurg                  | 100          | Gawade Santosh Ankush                                                                                                                                 | Humarmala, Sindhudurg                  | 9423301440                                   |
| 20     | okra           | PHALTAN WOMEN FARMER PRODUSER COMPANI LTD.          | At post-SAKHARWADI Taluk-PHALTAN       | 500          | 1) SIMA RAJENDRA JAGTAP<br>2) LATA BHAGVAN MADKAR<br>3) RANJANA ANKUSH NALAVDE<br>4) SANDHYA VASANTRAO JAGTAP<br>5) SUNITA SOMNATH BHOSALE            | AT.POST. - SAKHARWADI Taluk-PHALTAN    | Telephone No.:<br>Mobile No.: - 9423863960   |
| 21     | Paddy          | Venna Valley Agro Producer Company Ltd.             | Asani tal (Kelghar) Tal-Jawali (Medha) | 452          | -                                                                                                                                                     | Asani tal (Kelghar) Tal-Jawali (Medha) | Telephone No.:<br>Mobile No.: 9604515314     |
| 22     | Pomegranate    | Gopalkrushna Farmer Agro Producer Company Ltd.      | At-post-Girvi Tal- Phaltan Dist-satara | 360          | 1) Ajay Balasaheb Kadam<br>2) Nilesh Maljirao Kadam<br>3) Bhaskar Popatrao Kadam<br>4) Vijay Narayan Kadam<br>5) Ajay Balasheb Kadam                  | At-post-Girvi Tal- Phaltan Dist-satara | Telephone No.:<br>Mobile No.:9130540111      |
| 23     | Turmeric       | Ajinkyatara Satvik Organic Farmers Producer Company | At Post Malgaon Tal & Dist Satara      | 270          | Vikram Sadashiv Kadam                                                                                                                                 | At Post Malgaon Tal & Dist Satara      | Telephone No.:<br>Mobile No.:                |
| 24     | Wheat          | Ramrajya Agro Producer Company Ltd.                 | At post-Fadatarwadi tal-phaltan        | 418          | 1) Bhaubali Ratanchand Saha<br>2) Mukund Dattatray Dhanawade<br>3) Deepak Vilas Gaikwad<br>4) Govind Shanker Nanaware<br>5) Mahendra Babanrao Gaikwad | At post-Fadatarwadi tal-phaltan        | Telephone No.: -<br>Mobile No.: - 9890395393 |
| 25     | Wheat          | Pharandwadi krushikranti Agro Producer Company Ltd. | At post-Pharandwadi tal-phaltan        | 452          | 1) Bappu Subhash Borate<br>2)Diip Mahipat Dalvi<br>3)Abhijit Vishnu Nale<br>4)Rajendra Kanta Borate<br>5)Vijay Savta Nale                             |                                        | Telephone No.: -<br>Mobile No.: - 9960472429 |

| S. No. | Commodity Name | Name of the FPC                                      | Address of the FPC                                            | Shareholders | Name of the Promoter(s)/Partner(s)                                                                                                       | Address of the FPC                                            | Contact No of FPC                        |
|--------|----------------|------------------------------------------------------|---------------------------------------------------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------|
| 26     | Turmeric       | Krishna koyna Agro Producer company                  | A/P Wadgoan haveli tal - karad Dist- Satara                   | 420          | Rajendra Bajirao Thorat<br>suhas Shankarrao jagtap<br>Ranjit Balasaheb Jagtap<br>Pratap Dhondiram jagtap<br>Shobha Pandurang Jagtap      | a/p wadgoan haveli tal karad dist satara                      | Telephone No.:<br>Mobile No.:            |
| 27     | Soybean        | shri yamai agro producer company aundh               | ap aundh tal khatav dist satara                               | 283          | 1)sourabh chndrakant kumbhar2),Bhim rao tukaram bhosle3),sanket sandip ingale4),prashant bhgvan kumbhar5)Anis Altaf patvakari            | ap aundh tal khatav dist satara                               | Telephone No.:<br>Mobile No.:9850426238  |
| 28     | Banana         | Lokvikas Farmers Producer Company Ltd. Shetphal (N)  | Gat No-93, At/Post- Shetphal (N), Tal- Karmala, Dist- Solapur | 20           | 1. Pol Vishnu Satish<br>2. Gajendra Nagnath Pol<br>3. Prashant Bhagvan Naiknavare<br>4. Vaibhav Vasant Pol<br>5. Nanasheh Vikram Salunke | Gat No-93, At/Post- Shetphal (N), Tal- Karmala, Dist- Solapur | Telephone No.:<br>Mobile No.: 7755936262 |
| 29     | Maize          | Malkavathe FPO                                       | Gat 291 at post malkavathe tal. south solapur dist. solapur   | 660          | 11                                                                                                                                       | Gat 291 at post malkavathe tal. south solapur dist. solapur   | Telephone No.:8830569553<br>Mobile No.:  |
| 30     | Onion          | Kalman Agro Producer Company Ltd. KALMAN             | At/Post- KALMAN, Tal- NORTH SOLAPUR,, Dist- Solapur           | 11           | PATIL NANDKUMAR SUBHASH,anil babruvan pawar,prabhakar madhukar bidawe,abhiman pandhari mali.dhanaji laxman shinde,sunil nanasaheb patil  | At/Post- KALMAN, Tal- NORTH SOLAPUR,, Dist- Solapur           | Telephone No.:<br>Mobile No.: 9764643830 |
| 31     | Pomegranate    | Spiritual Farming Natural Agro Producer Company Ltd. | Madha Solapur                                                 | 110          | NA                                                                                                                                       | Madha Solapur                                                 | 9028598955                               |
| 32     | FPC Onion      | Agasti Farmers producer company.ltd.                 | Mehenduri,Tal: akole                                          | 329          | 5                                                                                                                                        | Mehenduri.Tal: Akole.                                         | Telephone No.:<br>Mobile No.:9975299214  |
| 33     | FPC Maize      | Sai Pravara FPO                                      | Chincholi, Rahuri                                             |              | Ashok Vishwanath Gagare                                                                                                                  | A/P - Chincholi, Rahuri                                       | Telephone No.:<br>Mobile                 |

| S. No. | Commodity Name | Name of the FPC                         | Address of the FPC                             | Shareholders | Name of the Promoter(s)/Partner(s)                                                               | Address of the FPC                                      | Contact No of FPC                                     |
|--------|----------------|-----------------------------------------|------------------------------------------------|--------------|--------------------------------------------------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------|
|        |                |                                         |                                                |              |                                                                                                  |                                                         | No.:77579147<br>35,<br>992294149                      |
| 34     | FPC Soyabean   | Punyastambh Farmer Producer Compony     | Ap: Puntamba Tal- Rahata                       | 350          | Vijay Pandharinath Dhanawate                                                                     | Ap: Puntamba Tal- Rahata                                | Telephone No.:82087867<br>33<br>Mobile No.:8208786733 |
| 35     | FPC Soyabean   | Boradi Parisar FPC                      | Boradi Parisar,Boradi, Tal Shirpur,Dist-Dhule. | 251          | President - Raman Shankar Pawara,Secretary - Rahul Prabhakar Badgujar.(Total No Of Promoters -5) | Boradi Parisar,Boradi, Tal Shirpur,Dist-Dhule.          | Telephone No.:9423288310<br>Mobile No.:9823605417     |
| 36     | FPC Maize      | Surmai Farmer Producers Company         | Khalane Tal-Shindkheda Dist Dhule              | 324          | President - Sudhakar Prakash Wagh Vice Pre.Ganesh Subhash Bhadane (No of Promotres 5)            | Khalane Tal-Shindkheda Dist Dhule                       | Telephone No.:<br>Mobile No.:9730855885               |
| 37     | FPC Maize      | Rajmudra Farmer Producer Co. LTD        | Kusumba Tal Dist -Dhule                        | 350 Members  | Pre. Mahendra Nimba Pardeshi, Sec.Savita Hiralal Pardeshi ( 5 Members of Promoters )             | Kusumba Tal Dist -Dhule                                 | Telephone No.:<br>Mobile No.:7588319968               |
| 38     | FPC Maize      | Jyotiba Farmer Producer Company         | Nyahalod Tal Dist -Dhule                       | 209 Members  | Pre.-Prakash Kautik Wagh,Sec.- Nanabhau Keshav Pawar (Promoters no. 5)                           | Nyahalod Tal Dist -Dhule                                | Telephone No.:<br>Mobile No.:7588002074               |
| 39     | FPC Onion      | Shree Vignharta Farmar Producer company | At Post Chhadvel Korde Tal Sakri Dist. Dhule   | 320          | Hemraj Fakira Patil                                                                              | At/p- Chhadvel Korde Tal-Sakri Dist-Dhule               | Telephone No.:<br>Mobile No.:9049409777               |
| 40     | FPC Onion      | Krusha Aaradhana Farmar Procuer Company | At/post -Jaitane Tal-Sakri Dist-Dhule          | 218          | Anil Madhukar Sonawane (Total no of 5 Promoters)                                                 | At/Post -Jaitane Tal-Sakri Dist-Dhule                   | 9860988525                                            |
| 41     | FPC Paddy      | Ajara Agro Producer Company Ltd.        | Old post galli Ajara, Kolhapur                 | 503          | Mr. Sambhaji Hari Sawant - President<br>Mr. Appa Krushna Pawale - Vice President                 | Old post galli Ajara, Kolhapur                          | 9420133762                                            |
| 42     | FPC Millet     | Vinayak Farmers producer co. I MT       | 96A, Bhadgaon Road, Gadhinglaj                 | 509          | Kiran Magdum, Rajshri Magdum, Rajendra More, Ramkrishna Magdum, Nikhil Magdum                    | 96A, Opp. Jagruti hgh school, Bhadgaon road, Gadhinglaj | 9423276321                                            |
| 43     | FPC Banana     | Family farming producer company limited | 525 watharwarana state highway,                | 530          | Pladi Ajitsinh Abasaheb                                                                          | 525 watharwarana state highway,                         | 7507155551<br>7507997711                              |

| S. No. | Commodity Name | Name of the FPC                                    | Address of the FPC                                | Shareholders | Name of the Promoter(s)/Partner(s)                                                                                                                                                                        | Address of the FPC                                                               | Contact No of FPC                                |
|--------|----------------|----------------------------------------------------|---------------------------------------------------|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|--------------------------------------------------|
|        |                |                                                    | Talsande, Warana, Kolhapur                        |              |                                                                                                                                                                                                           | Talsande, Warana, Kolhapur                                                       |                                                  |
| 44     | FPC Soyabean   | Shetkari Vikas Agro producers company ltd          | Sajani, Tal. Hatkangle, District Kolhapur         | 470          | Mr Bharat M Kanise                                                                                                                                                                                        | Sajani, Tal. Hatkangle, District Kolhapur                                        | 9373246533                                       |
| 45     | FPC Cashewnut  | Jivhala Farmers Producer Cpmapny Ltd               | A/P Uttur                                         | 386          | hivshankar Sidhoji Jakkhanawar Sanjay Hanamant Hatlargo                                                                                                                                                   | A/P Uttur                                                                        | 9673922373                                       |
| 46     | FPC Paddy      | Nesu Parisar FPC, Ltd. Khandbara                   | AT post Khandbara Tal Navapur Dist - Nandurbar.   | 227          | 5                                                                                                                                                                                                         | AT post Khandbara Tal Navapur Dist - Nandurbar.                                  | Mobile No.: 9049418233<br>Mobile No.: 8551078778 |
| 47     | FPC Paddy      | Bahugunit FPC, Ltd. Karanji                        | AT Post Karanji Tal Navapur Dist - Nandurbar.     | 316          | 1) Kisan Nandya Gavit<br>2) samvel Rupaji Gavit<br>3) Rajendra Madhukar Vasave<br>4) Kantilal Gobji gavit<br>5) Sangita Suresh Gavit                                                                      | AT Post Karanji Tal Navapur Dist - Nandurbar.                                    | Mobile No.: 9404800339<br>Mobile No.: 9404758922 |
| 48     | FPC Paddy      | Yaha Adivasi Navapur FPC, Ltd. Vadsatra            | AT Post Vadsatra, Tal - Navapur Dist - Nandurbar. | 255          | 1)Kisan Jana Vasave<br>2) Gemji Narsi Valvi<br>3) Nima Vasu Gavit<br>4) Suresh Jarmansing Naik<br>5) Ajit Shamsing Valvi                                                                                  | AT Post Vadsatra, Tal - Navapur Dist - Nandurbar.                                | Mobile No.: 9405577713<br>Mobile No.: 8888053767 |
| 49     | FPC Gram       | Jivandayini Tapi Innovative farmer Producer Co.ltd | At/post-fesh Tal Shahada Dist-Nandurbar           | 300          | yogesh vijay patil<br><br>Sandeep laxman patil<br><br>Rajshri Ravindra patil<br><br>Sanjay Bansi Patil<br>Sanjay Bansi Patil<br><br>Sanjay Jangesh Chudhari<br>Kiran hiralal pat<br>Bapu Mansaram Marathe | At/post fesh TalShahadaDist Nandurbar<br>At/post-fesh Tal Shahada Dist-Nandurbar | Telephone No.:<br>Mobile No.:7588921700          |
| 50     | FPC Paddy      | Nesu Parisar FPC, Ltd. Khandbara                   | AT post Khandbara Tal Navapur Dist - Nandurbar.   | 227          | 5                                                                                                                                                                                                         | AT post Khandbara Tal Navapur Dist - Nandurbar.                                  | Mobile No.: 9049418233<br>Mobile No.: 8551078778 |

| S. No. | Commodity Name  | Name of the FPC                                                   | Address of the FPC                                            | Shareholders | Name of the Promoter(s)/Partner(s)                                                            | Address of the FPC                                            | Contact No of FPC                                           |
|--------|-----------------|-------------------------------------------------------------------|---------------------------------------------------------------|--------------|-----------------------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|
| 51     | FPC Brinjal     | Varnamai Agro Producer Co.Ltd                                     | Karanjwade , Tal- Walwa, Dist- Sangli                         | 500          | Ramrao Sampat Patil, Pramod Shivaji Patil                                                     | Gat No.147, A/p- Karanjwade , Tal- Walwa, Dist- Sangli        | Telephone No.:<br>Mobile No.:<br>7768065707                 |
| 52     | FPC Tomato      | Varnamai Agro Producer Co.Ltd                                     | Karanjwade , Tal- Walwa, Dist- Sangli                         | 500          | Ramrao Sampat Patil, Pramod Shivaji Patil                                                     | Gat No.147, A/p- Karanjwade , Tal- Walwa, Dist- Sangli        | Telephone No.:<br>Mobile No.:<br>7768065707                 |
| 53     | FPC Grapes      | Drakshayani Farmers Producer Co Ltd.                              | At Soni Tal Miraj Dist Sangli                                 | 100          | Rangrao Dhondiram Jadhav And Other 10                                                         | At Soni Tal Miraj Dist Sangli                                 | Mobile No.:9764062211                                       |
| 54     | FPC Jowar       | Pimpalpaan Organic Farmers Producer Company Limited.              | Irali , Tal. - Kavthe- Mahankal , Dist. - Sangli , 416405 .   | 631          | Shree Nitin Shankar Patil                                                                     | Irali , Tal. - Kavthe- Mahankal , Dist. Sangli , 416405 .     | Telephone No.:<br>Mobile No.:<br>7057639777                 |
| 55     | FPC Pomegranate | Shetkari Praja Farmers producers Company Ltd. Atpadi Dist- Sangli | Krushinagar, Atpadi Dist- Sangli                              | 300 member   | Chairman- Sanjay Chavan                                                                       | Krushinagar, Atpadi Dist- Sangli                              | Telephone No.:<br>Mobile No.:<br>992292029                  |
| 56     | FPC Soyabean    | Shree Mahaganapati agro producer company Ltd.                     | Thanapude, Tal: Walwa, Sangli 415412                          | 909          | Chairman :Subhash Rangrao Patil, Secretary : Lavankush Rajaram Nangare                        | Thanapude, Tal: Walwa, Sangli 415412                          | "Telephone No.:<br>9403780147<br>Mobile No.:<br>9673625798" |
| 57     | FPC Brinjal     | Varnamai Agro Producer Co.Ltd                                     | Karanjwade , Tal- Walwa, Dist- Sangli                         | 500          | Ramrao Sampat Patil, Pramod Shivaji Patil                                                     | Gat No.147, A/p- Karanjwade , Tal- Walwa, Dist- Sangli        | "Telephone No.: Mobile No.:<br>7768065707"                  |
| 58     | FPC Tomato      | Varnamai Agro Producer Co.Ltd                                     | Karanjwade , Tal- Walwa, Dist- Sangli                         | 500          | Ramrao Sampat Patil, Pramod Shivaji Patil                                                     | Gat No.147, A/p- Karanjwade , Tal- Walwa, Dist- Sangli        | "Telephone No.: Mobile No.:<br>7768065707"                  |
| 59     | FPC Brinjal     | Varnamai Agro Producer Co.Ltd                                     | Karanjwade , Tal- Walwa, Dist- Sangli                         | 500          | Ramrao Sampat Patil, Pramod Shivaji Patil                                                     | Gat No.147, A/p- Karanjwade , Tal- Walwa, Dist- Sangli        | "Telephone No.: Mobile No.:<br>7768065707"                  |
| 60     | FPC Tomato      | Varnamai Agro Producer Co.Ltd                                     | Karanjwade , Tal- Walwa, Dist- Sangli                         | 500          | Ramrao Sampat Patil, Pramod Shivaji Patil                                                     | Gat No.147, A/p- Karanjwade , Tal- Walwa, Dist- Sangli        | "Telephone No.: Mobile No.:<br>7768065707"                  |
| 61     | FPC Banana      | Lokvikas Farmers Producer Company Ltd. Shetphal (N)               | Gat No-93, At/Post- Shetphal (N), Tal- Karmala, Dist- Solapur | 20           | 1. Pol Vishnu Satish 2. Gajendra Nagnath Pol 3. Prashant Bhagvan Naiknavare 4. Vaibhav Vasant | Gat No-93, At/Post- Shetphal (N), Tal- Karmala, Dist- Solapur | "Telephone No.: Mobile No.:<br>7755936262"                  |

| S. No. | Commodity Name | Name of the FPC                                    | Address of the FPC                                          | Shareholders                                         | Name of the Promoter(s)/Partner(s)                                                                                                                                       | Address of the FPC                                          | Contact No of FPC                       |
|--------|----------------|----------------------------------------------------|-------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------|
|        |                |                                                    |                                                             |                                                      | Pol 5.<br>Nanasaheb<br>Vikram Salunke                                                                                                                                    |                                                             |                                         |
| 62     | FPC Onion      | Kalman Agro Producer Company Ltd. KALMAN           | At/Post-KALMAN, Tal-NORTH SOLAPUR,, Dist- Solapur           | 11                                                   | PATIL<br>NANDKUMAR<br>SUBHASH,anil<br>babruvan<br>pawar,prabhakar<br>madhukar<br>bidawe,abhiman<br>pandhari<br>mali.dhanaji<br>laxman<br>shinde,sunil<br>nanasaheb patil | At/Post-KALMAN, Tal-NORTH SOLAPUR,, Dist- Solapur           | "Telephone No.: Mobile No.: 9764643830" |
| 63     | FPC Maize      |                                                    | Gat 291 at post malkavathe tal. south solapur dist. solapur | 660                                                  | 11                                                                                                                                                                       | Gat 291 at post malkavathe tal. south solapur dist. solapur | "Telephone No.:88305695 53 Mobile No.:" |
| 64     | FPC Paddy      | Darnamai Farmer Producer Company Ltd               | Kurhegaon, Igatpuri, Nashik                                 | 650                                                  | Director - 5,<br>Promoter - 5                                                                                                                                            | Kurhegaon, Igatpuri, Nashik                                 | 9921468476/<br>9270127718               |
| 65     | FPC Onion      | Five star green farmers producer company           | At post sawki, Deola, Nashik                                | 502                                                  | 12                                                                                                                                                                       | At post sawki, Deola, Nashik                                | 7972839593<br>9970253418                |
| 66     | FPC Tomato     | Janki Agriculture farmer producer company, palkhed | Palkhed, Niphad, Nashik                                     | 652                                                  | President - Anil<br>Madhukar Nikam<br>Secretary -<br>Santosh<br>Radhakrushna<br>Aaher                                                                                    | Palkhed, Niphad, Nashik                                     | 9822398255                              |
| 67     | FPC Maize      | Rokadeshwar farmers producer company pvt ltd       | Nimgaon Sinnar, Sinnar, Nashik                              | 538                                                  | Director 5,<br>Promoter 5                                                                                                                                                | Nimgaon Sinnar, Sinnar, Nashik                              | 9975899500<br>8888928096                |
| 68     | FPC Grapes     | Sahyadri Farmers Producer Co Ltd                   | Gala No 314/1 & 2, Mohadi, Dindori, Nashik                  | 623<br>Shareholders/<br>622<br>Registered<br>farmers | Vilas Vishnu<br>Shinde                                                                                                                                                   | Sr No 1102/08,<br>Behind Police<br>HQ, Adgaon,<br>Nashik    | 9850507937                              |
| 69     | FPC Onion      | Shivrana Farmer producer company ltd               | At post narul, Kalwan, nashik                               | 503                                                  | 5                                                                                                                                                                        | At post narul, Kalwan, nashik                               | 7588730200                              |
| 70     | FPC Jowar      | Karhamai Agro Producer Company                     | A/P - Karhati, Baramati, Pune                               | 670                                                  | Shri Vijay Anna<br>Salunke                                                                                                                                               | A/P - Karhati, Baramati, Pune                               |                                         |
| 71     | FPC Onion      | Kendramata Farmer producer company                 | A/P Kendur, Shirur, Pune                                    | 462                                                  | Chairman,<br>Sandeep Surke                                                                                                                                               | A/P Kendur, Shirur, Pune                                    | 9011999776                              |
| 72     | FPC Potato     | Satrajibaba Agro Producer company                  | A/P - Vafgaon, Khed, Pune                                   | 430                                                  | NA                                                                                                                                                                       | NA                                                          | 9561302151                              |
| 73     | FPC Soyabean   | Nathson Farmers Producer Company                   | A/P - Sangavi, baramati                                     | 485                                                  | Nitin Shrirang<br>taware                                                                                                                                                 | A/P - Sangavi, baramati                                     | 9657492900                              |
| 74     | FPC Tomato     | Vagheshwar Krupa Agro Producer Company             | A/P Mandavgan Parata, Shirur, Pune                          | 447                                                  | President -<br>Sagar Pharate                                                                                                                                             | NA                                                          | 9850273344                              |

| S. No. | Commodity Name | Name of the FPC                                                   | Address of the FPC                                                              | Shareholders | Name of the Promoter(s)/Partner(s)                                                                                                                          | Address of the FPC                                                              | Contact No of FPC                                            |
|--------|----------------|-------------------------------------------------------------------|---------------------------------------------------------------------------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|--------------------------------------------------------------|
| 75     | Maize          | Bhama Farmer Producer Comp.                                       | Alp-Pimpri, Tal-Khed, Dist-Pune                                                 | 457+19       | -                                                                                                                                                           | Alp-Pimpri, Tal-Khed, Dist-Pune                                                 | Telephone No.:<br>Mobile No.:<br>9552503418                  |
| 76     | Pomegranate    | Bhimaghod Agro Producer Com                                       | Alp. Babhulsar BK, Tal- Shirur                                                  | 372          | chairman-Santosh Nagwade                                                                                                                                    | -                                                                               | Telephone No.:<br>Mobile No.:<br>9923627168                  |
| 77     | Chilli         | Nandnagari farmer Producer Company Ltd. Bhaler.                   | At/post-Bhaler, Tal Dist-Nandurbar                                              | 276          | 1) Kailas Bhaidas Patil<br>2) Chhayabai Hiralal Patil<br>3) Latabai Bhatu Patil<br>4) Anita Kailas Patil<br>5) Chitrabai Gulab Patil                        | At/post-Bhaler, Tal Dist-Nandurbar                                              | Telephone No.:<br>9359103396<br>Mobile No.:<br>8830087996    |
| 78     | Chilli         | Doodhganga Agro Producers Company Limited                         | At/p Walve BK, Radhanagri, Kolhapur                                             | 505          | Ashok Maruti Faratte                                                                                                                                        | Near laxmi mandir, Malvadi kasaba Walve, Radhanagri, Kolhapur                   | 9552512093                                                   |
| 79     | Chilli         | Herambh Ganesh farmer Producer Company                            | At/post-Vadali Tal Shahada Dist-Nandurbar                                       | 605          | Ritesh Khemraj Borase<br><br>Ramkrushna Pandurangir Gosavi<br><br>Varshabai Kantigir Bawa<br><br>Raghunath Bhalechandra Chaudhari<br><br>Shankar Dhondumali | At/post-Vadali Tal Shahada Dist-Nandurbar                                       | Telephone No.:<br>Mobile No.:<br>9922318056                  |
| 80     |                | Navi Disha FPC, Malwandi                                          | Madha-Vairag Road (Vairag Tah. Barshi                                           | 2024         | MSRLM                                                                                                                                                       | Devashala Sutar                                                                 | Telephone No.:<br>Mobile No.:<br>Aware Tai -<br>8830415709   |
| 81     |                | SAKSHAM MAHILA PRABHGH SANGH,KADLAS.                              | AT POST KADLAS TAL SANGOLA                                                      |              | MSRLM                                                                                                                                                       | AT POST - KADLAS, TAL SANGOLA                                                   | Telephone No.:<br>Mobile No.:<br>LATIFA PATEL<br>7875490100. |
| 82     | Paddy          | Asmita Loksanchait-Sadhan Kendra                                  | Karveer, Kolhapur                                                               | 4718         | 17 villages                                                                                                                                                 | Karveer, Kolhapur                                                               | Telephone No.:0231-2368481<br>Mobile No.:<br>9834547893      |
| 83     | Millet         | Akkanani community managed resource centre , Dhudagaon, Nandurbar | Smt Arunabai Virasing Pawara, Near suresh welding workshop, Dudhgaon, Nandurbar | 2271         | Ms Suraja Baraku Valvi                                                                                                                                      | Smt Arunabai Virasing Pawara, Near suresh welding workshop, Dudhgaon, Nandurbar | Telephone No.:NA<br>Mobile No.:9403817300                    |

| S. No. | Commodity Name | Name of the FPC                                                   | Address of the FPC                                                              | Shareholders | Name of the Promoter(s)/Partner(s)            | Address of the FPC                                                              | Contact No of FPC                                        |
|--------|----------------|-------------------------------------------------------------------|---------------------------------------------------------------------------------|--------------|-----------------------------------------------|---------------------------------------------------------------------------------|----------------------------------------------------------|
| 84     | Maize          | Akkarani community managed resource centre , Dhudagaon, Nandurbar | Smt Arunabai Virasing Pawara, Near suresh welding workshop, Dudhgaon, Nandurbar | 2271         | Ms Suraja Baraku Valvi                        | Smt Arunabai Virasing Pawara, Near suresh welding workshop, Dudhgaon, Nandurbar | Telephone No.:NA<br>Mobile No.:9420856276,<br>9404299174 |
| 85     | Onion          | SHIVNERI LOKSANCHALIT SADHAN KENDRA                               | MAHABARE COMPLEX NEAR NEW BUS STAND JUNNER                                      | 2286         | MAHILA AARTHIK VIKAS MAHAMANDAL PUNE DISTRICT | MAHABARE COMPLEX NEAR NEW BUS STAND JUNNER                                      | Telephone No.:<br>Mobile No.:7219778019                  |
| 86     | Onion          | Jidnyasa Loksanchalit Sadhan Kendra Manchar                       | Near shrikrishana patasanstha moraya market Taluka manchar,Ambe goan            | 1872         | Mahila Arthikm Vikas Mahamandal Pune          | Near shrikrishana patasanstha moraya market Taluka manchar,Ambe goan            | Telephone No.:<br>Mobile No.:996054336                   |
| 87     | Paddy          | Dipstamba loksanchalit sadhan kendra                              | Near S.T front of shramik hall Ta.bhor District Bhor                            | 3225         | Mahila Arthik Vikas Mahamandal Pune           | Near S.T front of shramik hall Ta.bhor District Bhor                            | Telephone No.:8788244578<br>Mobile No.:                  |
| 88     | Potato         | Jidnyasa Loksanchalit Sadhan Kendra Manchar                       | Near shrikrishana patasanstha moraya market Taluka manchar,Ambe goan            | 1872         | Mahila Arthikm Vikas Mahamandal Pune          | Near shrikrishana patasanstha moraya market Taluka manchar,Ambe goan            | Telephone No.:<br>Mobile No.:996054336                   |
| 89     | Tomato         | SHIVNERI LOKSANCHALIT SADHAN KENDRA                               | MAHABARE COMPLEX NEAR NEW BUS STAND JUNNER                                      | 2286         | MAHILA AARTHIK VIKAS MAHAMANDAL PUNE DISTRICT | MAHABARE COMPLEX NEAR NEW BUS STAND JUNNER                                      | Telephone No.:<br>Mobile No.:7219778019                  |
| 90     | Grapes         | Suvidha Loksanchalit Sadhan Kendra, Tasgaon.                      | Siddheshwar Road, Opp. CBI, Tal- Tasgaon, Dist- Sangli.                         | 4255         | Mahila Arthik Vikas Mahamandal                | Siddheshwar Road, Opp. CBI, Tal- Tasgaon, Dist- Sangli.                         | Telephone No.: 02346-240266<br>Mobile No.: 9049828454    |
| 91     | Wheat          | NA                                                                | NA                                                                              | NA           | NA                                            | NA                                                                              | Telephone No.: 02166-25942<br>Mobile No.:9763418716      |
| 92     | Soybean        | Pragati Locksanchilt Sadhan Kendra                                | Karanje Peth Manas Apartment , Karanje                                          | 4833         | NA                                            | NA                                                                              | Telephone No.: 02162-235081<br>Mobile No.:9604751860     |
| 93     | Jowar          | Pragati Locksanchilt Sadhan Kendra, Satara                        | Karanje Peth Manas Apartment , Karanje                                          | 4833         | NA                                            | NA                                                                              | Telephone No.: 02162-235081<br>Mobile No.:9604751860     |
| 94     | Onion          | Shiddeshware                                                      | Shetphal                                                                        | 212          | Sakuntla Mane                                 | Shetphal                                                                        | Telephone No.:<br>Mobile                                 |

| S. No. | Commodity Name | Name of the FPC                  | Address of the FPC                    | Shareholders | Name of the Promoter(s)/Partner(s) | Address of the FPC                    | Contact No of FPC                       |
|--------|----------------|----------------------------------|---------------------------------------|--------------|------------------------------------|---------------------------------------|-----------------------------------------|
|        |                |                                  |                                       |              |                                    |                                       | No.:9665042765                          |
| 95     | Pomegranate    | Parivartan CMRC Velapur          | A-P Velapur, Tal-Malshiras            | 50           | Sapna Mahibub Shaikh               | A-P Velapur                           | Telephone No.:<br>Mobile No.:9763613984 |
| 96     | Maize          | Disha Loksanchit Sadhan Kendra   | At post Boradi                        | 6            | Lalita Vijay Mali                  | At post Shirpur                       | Telephone No.:<br>Mobile No.:9518785411 |
| 97     | Onion          | Aadhur Loksanchlit Sadhan Kendra | At Post-Nijampur Tal-Sakri Dist-Dhule | 11           | Aadhur Loksanchlit Sadhan Kendra   | At Post-Nijampur Tal-Sakri Dist-Dhule | Telephone No.:<br>Mobile No.:9284681235 |

### G.31 List of GRCs Consulted

**Table 89: List of GRC Consulted**

| S. No | Name of the GRC                             | Address of the GRC                           | No of Shareholders / members of GRC | Name of the Promoter(s)/Partner(s) | Address of the GRC                           | Contact No of GRC                                           |
|-------|---------------------------------------------|----------------------------------------------|-------------------------------------|------------------------------------|----------------------------------------------|-------------------------------------------------------------|
| 1     | MKVG Hatkangle                              | AIP Hatkangle, Kolhapur                      | 4329                                | 18 villages                        | Hatkangle                                    | Telephone No:<br>0230-2483684<br>Mobile No:                 |
| 2     | Ranikajal community Managed resource centre | At past pikkalkuwa Tq Akkalkuwa, Nandurbar   | 2056                                | Smt Rekha Padvi                    | At past pikkalkuwa Tq Akkalkuwa, Nandurbar   | Telephone No:<br>NA<br>Mobile No:<br>9404035707             |
| 3     | Parivartan CMRC, Kavathemahankal            | At-Post/Taluka - Kavathemahankal Dist-Sangli | 4215                                | Mahila Arthik Vikas Mahamandal     | At-Post/Taluka - Kavathemahankal Dist-Sangli | Telephone No.:<br>02341222060<br>Mobile No.:<br>9765845057  |
| 4     | OMSAI CMRC Phaltan                          | Burud gali Kasba Peth Phaltan                | NA                                  | Mavim                              | Burud Galli                                  | Telephone No.:<br>02166-220942<br>Mobile No.:<br>9763418716 |
| 5     | Shiddeshwar                                 | Shetphal                                     | 347                                 | Sarika Dipak Pawar                 | A/P Shetphal                                 | Telephone No.:<br>Mobile No.:<br>9665042765                 |
| 6     | Parivartan CLF Velapur                      | Velapur, Ta-Malshiras Dist-Solapur           | 50                                  | Sapna Mahibub Shaikh               | At PO-Velapur                                | Telephone No.:02185245066<br>Mobile No.:<br>9763613984      |
| 7     | KRUSHI KUMAR sheep and goat company         | At post: Rashin Ta :karjat .                 | 459                                 | santosh vasant kambale             | at post : Rashin Ta :karjat .                | Telephone No.:<br>Mobile No.:<br>9970796415                 |

## G.32 List of APMC Market Consulted

**Table 90: List of APMC Market Consulted**

| S. No | Name of the Wholesale Market                                | Type of Wholesale Market (Corporate /SME/ Start-up) | Name of the Promoter / Partners              | Address of the Wholesale Market                                                       | Contact No.                                     |
|-------|-------------------------------------------------------------|-----------------------------------------------------|----------------------------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------|
| 1     | APMC Ahmednagar                                             | Govt. (Regulated market )                           | Elected body                                 | kisankranti Building marketyard Ahmednagar                                            | Telephone:<br>Mobile:9423162935                 |
| 2     | APMC Shevgaon                                               | Govt. (Regulated market )                           | Elected body                                 | APMC, Marketyard Shevgaon                                                             | Telephone:<br>Mobile:9423162935                 |
| 3     | Ajay Traders                                                | Other                                               | Vijay Vasantao Chinchole                     | Apmc Dhule dist Dhule                                                                 | Telephone:<br>Mobile: 9422798397                |
| 4     | Kolhapur Agriculture Produce Market Committee, Kolhapur     | Semi Gov. - Local Authority                         | Director Body .                              | Shree Shahu Market Yard, Kolhapur                                                     | Telephone:<br>02312651404<br>Mobile: 8888846136 |
| 5     | Jaysingpur A.P.M.C.Jaysingpur, Taluka-Shirol, Sist.Kolhapur | semi govermet local authority.                      | co-operative                                 | Jaysingpur apmc jaysingpur, ratnappa kumbhar market yard, taluka shirol,dist-kolhapur | Telephone:<br>02322(221588, 221688)"<br>Mobile: |
| 6     | Nandurbar APMC                                              | Govt. Regulated Market                              | Nandurbar APMC                               | Nandurbar APMC                                                                        | Telephone:<br>Mobile:                           |
| 7     | Shahada APMC                                                | Govt. Regulated Market                              | Shahada APMC                                 | Shahada APMC                                                                          | Telephone:<br>Mobile:                           |
| 8     | APMC Sinner                                                 | Govt                                                | Public Authority                             | APMC Sinner, Shirdi road, Sinner                                                      | Telephone:02551-220037<br>Mobile:7588172707     |
| 9     | Nashik                                                      | Govt                                                | Directors                                    | Dindori road, Panchavati, Nashik                                                      | Telephone:<br>Mobile:                           |
| 10    | Shri Navnath Sriram Lokhande                                | Corporate Market, Startup-25/02/1985                | Shri Navnath Sriram Lokhande                 | A.P.M.C Market Yard Khed Tal-Khed Dist-Pune Pin-410505                                | Telephone:-02135-222031<br>Mobile:-9822318382   |
| 11    | Agriculture Produce Market committee, Phaltan               | Local Authority                                     | -                                            | Market yard, Mahad-Pandharpur Road, Phaltan, Dist-Satara                              | 02166-222216,<br>9623889988                     |
| 12    | Agriculture produce market committee,Palus                  | Local authority                                     | -                                            | Karad-Tasgaon Road Main Market Yard Palus 416310                                      | Telephone:02346-229454<br>Mobile:               |
| 13    | Agriculture Produce Market committee,islam pur              | local authority                                     | -                                            | Islampur                                                                              | Telephone:0234-2222056<br>Mobile:               |
| 14    | Wai APMC                                                    | local authority                                     | -                                            | Yashwantnagar Wai                                                                     | Telephone:02167-227004<br>Mobile:9975192104     |
| 15    | Vashi APMC Market                                           | Govt                                                | Mumbai Agri Produce Market Committee, Mumbai | Sector 19, Vashi, Navi Mumbai, Maharashtra 400703                                     | (022) 2788 8414, (022) 2788 1400                |

### G.33 List of Retailers Consulted

**Table 91: List of Retailer Consulted**

| S. No. | Name of the Retailer                    | Type of Retailer (Corporate /SME/ Start-up) | Name of the Promoter / Partners         | Address of the Retailer                                                | Contact No.                                     |
|--------|-----------------------------------------|---------------------------------------------|-----------------------------------------|------------------------------------------------------------------------|-------------------------------------------------|
| 1      | Rajendra Waman Thorat                   | Govt. (Regulated Market)                    | Proprietor                              | Marketyard Ahmednagar                                                  | Telephone:<br>Mobile:9890654600                 |
| 2      | Rajendra Luxman Dheadray                | Govt. (Regulated market)                    | Proprietor                              | Gala No.1 marketyard APMC Shevgoan                                     | Mobile-9272701651                               |
| 3      | Mr. Bhika R. Baviskar(jitendra traders) | Other                                       | Mr. Bhika R. Baviskar(jitendra traders) | Shop No.5 Apmc Dhule                                                   | Telephone:<br>Mobile:9822051658                 |
| 4      | Mohsin Harun Bagwan                     | Self-owner                                  | Mohsin Harun Bagwan                     | 12 th lane Jaysingpur, Tal.Shirol Dist.kolhapur                        | Telephone:<br>Mobile: 9552529501                |
| 5      | JamirHazir nazaruddin Bagwan            | Self-owner                                  | JamirHazir nazaruddin Bagwan            | gala no.- 24,vegetable market Kolhapur apmc Tal.-karveer Dist.kolhapur | Telephone:<br>Mobile: 9822399111                |
| 6      | Vijay Parimal Jain                      | Proprietorship                              | own                                     | Apmc Shahada                                                           | 9763629925                                      |
| 7      | Kanhaiyalal Ravaji Wani                 | Proprietorship                              | single                                  | apmc nandurbar                                                         | 9822435555                                      |
| 8      | Anil Jaiprakash Kalantri                | Individual                                  | Anil Jaiprakash Kalantri                | Gala no. 8 and 9, Main Market yard, APMC, Nashik                       | Telephone:<br>Mobile:9822012561                 |
| 9      | Omsai Traders                           | Corporate                                   | S.B.Kalekar                             | Nashik                                                                 | Telephone:<br>Mobile:9881809083                 |
| 10     | Dyaneshwar Laxman Vanmali               | Individual                                  | Dyaneshwar Laxman Vanmali               | Gala no. 8 and 9, Main Market yard, APMC, Nashik                       | Telephone:<br>Mobile:9422250482                 |
| 11     | Santosh B. Agrahari                     | Individual                                  | Santosh B. Agrahari                     | 44-34, Panchavati, Nashik                                              | Telephone:<br>Mobile:9890717420                 |
| 12     | Ms.Namdevrao B. Jadhav Company          | self owener                                 | -                                       | Market yard phaltan pandharpur road,satara                             | 02166-222216                                    |
| 13     | Shre Shantappa Sangappa Kondikop.       | corporate                                   | -                                       | Karad-Tasgaon Road Main Market Yard Palus 416310                       | Telephone:<br>Mobile: 8408803292                |
| 14     | Parasnath trading company               | SME                                         | Shailendra s.karande                    | apmc islampur                                                          | 7588920671                                      |
| 15     | Pravinkumar Kantilal Jain               | local authority                             | Kantilal Jain                           | 381 Madhali alli wai                                                   | Telephone:<br>02167-220904<br>Mobile:9822090116 |
| 16     | Mr. Mohan Pandit Patil                  | Other                                       | Patil and Company                       | Shop No.1,2 and 3, Market yard Shirpur, Dist -Dhule                    | Telephone:<br>Mobile:9422289393                 |

### G.34 List of Traders Consulted

**Table 92: List of Traders Consulted**

| S. No | Name of the Trading Company | Type (Corporate /SME/ Start-up) | Name of the Promoter / Partners | Contact No.        |
|-------|-----------------------------|---------------------------------|---------------------------------|--------------------|
| 1     | Sunny trading company       | corporate                       | no                              | Mobile: 9422033901 |
| 2     | Sundesh Traders             | corporate                       | no                              | Mobile: 7218118844 |
| 3     | Durga Trading Co.           | corporate                       | no                              | Mobile: 9423222076 |
| 4     | Kate Agro Foods             | corporate                       | no                              | Mobile: 9970317849 |
| 5     | Shantilal Sobhachand Munot  | corporate                       | no                              | Mobile: 9890509109 |

### G.35 List of Slaughter house Consulted

**Table 93: List of Slaughter House Consulted**

| S. No | Name of the Slaughter house                     | Owner | Address                                                | Contact                                                 | Area     | Type   |
|-------|-------------------------------------------------|-------|--------------------------------------------------------|---------------------------------------------------------|----------|--------|
| 1     | Deonar Abattoir                                 | BMC   | 1, Sindhi Society, Chembur, Mumbai, Maharashtra 400071 | Telephone: 022225563285, 02225563286                    | 64 acres | large  |
| 2     | Pune Muncipal Corporation Kondwa Slaughterhouse | PMC   | Salunke Vihar Road, Kamela, Kondhwa Pune.              | Telephone: 02025501237, 02025501226<br>Mobile: 26831966 | 2 acres  | Medium |

### G.36 List of Industries Consulted

**Table 94: List of Industries Consulted**

| S. No | Name of the Industry              | Owner                                                            | Address                                     | Contact                                                     | Area       | Type  |
|-------|-----------------------------------|------------------------------------------------------------------|---------------------------------------------|-------------------------------------------------------------|------------|-------|
| 1     | Aryas Natural Chipzee             | Mr Siddharth Patil<br>Mr Pranil Chowdhary<br>Mr Aniket Chowdhary | Sy. No. 372/1/1, Jamburgaon, Bordi, Palghar | Telephone : 9096445234<br>e-mail id:siddharth@aryasford.com | 6000 sq.ft | Small |
| 2     | Konkan Mango Processing Ratnagiri | Mr. Ramchandra Jainta Desai / Amar Desai                         | Ratnagiri                                   | 9552274274<br>Konkanmango@gmail.com                         |            | Small |

## H. Definition of Terms Used in RAP

**"Agricultural labourer"** means a person primarily resident in the affected area who does not hold any land in the affected area but who earns his/her livelihood principally by manual labour on agricultural land therein immediately before such declaration and who has been deprived of his/her livelihood.

**"Agricultural land"** includes lands being used for the purpose of - i) Agriculture or horticulture; ii) Dairy farming, poultry farming, pisciculture, breeding of livestock or nursery growing medicinal herbs; iii) Raising of crops, grass or garden produce; and land used by an agriculturist for the grazing of cattle, but does not include land used for cutting of wood only.

**"BPL family"**: The below poverty line (BPL) families shall be those as defined by the Planning Commission of India from time to time and included in a BPL list for the time being in force.

**"Competent Authority"**: means any person authorized by the Central /State Government, by notification, to perform the functions of the Competent Authority for such area as may be specified in the notification.

**"Census"**: is a data collection technique of completing enumeration of all Project Affected Families and their assets through household questionnaire.

**"Compensation"**: means payment in cash or in kind to replace losses of land, housing, income, and other assets caused by a project.

**"Cut-off date"**: This refers to the date prior to which the project affected family was in possession of the immovable or movable property within the affected zone. The Cut-off date for identifying the affected families including land owners, those having title claims recognized under other state and central laws, squatters and other non-title holders shall be the date of first land acquisition (LA) notification issued under Section 3 c (ii), (iv) (vi) of Land Acquisition, 2013. It is provided that the —PAP census survey shall be the basis for finalizing the eligibility for extending R&R benefits including assistance towards the replacement of affected structures of non-title holder PAPs.

**"Encroacher"**- A person/family, who transgresses into the public land (prior to the cut of date), adjacent to his/her own land or other immovable assets and derives his/her additional source of shelter/livelihood.

**"Entitlement"**: is defined as the right of project affected persons (PAPs) to receive various types of compensation, relocation assistance, and support for income restoration in accordance with the policy provisions.

**"Entitlement Matrix"**: is a table to define different nature of PAPs losses and compensation packages and other relocation assistance.

**"Family"**: includes a person, his or her spouse, minor sons, unmarried daughters, minor brothers, unmarried sisters, father, mother and other relatives residing with him or her and dependent on him or her for their livelihood; and includes "nuclear family" consisting of a person, his or her spouse and minor children.

**"Independent Evaluator"**: means an evaluator registered with government, hired by SMART PCMU, to provide inputs to the competent authority in arriving at the replacement cost of land.

**"Holding"** means the total land held by a person as an occupant or tenant or as both.

**"Khatedar"** means a person whose name is included in the revenue records of the parcel of land under reference.

**"Marginal farmer"** means a cultivator with an un-irrigated land holding up to one hectare or irrigated land holding up to half hectare.

**"non-agricultural labourer"** means a person who is not an agricultural labourer but is primarily residing in the affected area who does not hold any land under the affected area but who earns his/her livelihood principally by manual labour or as a rural artisan immediately before such declaration and who has been deprived of earning his/her livelihood principally by manual labour or as such artisan in the affected area.

**"Non-title holder"**: Affected persons/families with no legal title to the land, structures and other assets adversely affected by the project. Non-titleholders include encroachers, squatters, etc.

**"Notification"** means a notification published in the Gazette of India or, as the case may be the Gazette of a State.

**"Project"**: Refers to the Dedicated Freight Corridor project (DFC project).

**"Project Affected Persons (PAPs)"**: indicates any person being as it may an individual, a household, a firm or a private or public who, on account of the execution of the project, or any of its components or sub-projects or parts thereof would have their right, title or interest in any house, land or any other asset acquired or possessed, in full or in part; or business, occupation, work, place of residence or habitat adversely affected; or standard of living adversely affected, including the follows.

**Rehabilitation (Income restoration/Livelihood restoration)**: means the process to restore income earning capacity, production levels and living standards in a longer term.

**Replacement cost/value**: Replacement cost is the cost of purchasing comparable assets elsewhere by the affected person in lieu of the acquired land, buildings, structures, and other immovable assets, etc.

**Socio-economic survey**: is carried out in order to prepare profile of PAPs and to prepare for Resettlement Action Plan. The survey result is used (i) to assess incomes, identify productive activities, and plan for income restoration, (ii) to develop relocation options, and (iii) to develop social preparation phase for vulnerable groups.

**Small farmer** – A cultivator with an un-irrigated land holding up to 2 hectares or with an irrigated land holding up to 1 hectare, but more than a marginal farmer.

**Squatter** – A person/family that has settled on the public land without permission or has been occupying public building without authority prior to the cut-off date and is depending for his or her shelter or livelihood and has no other source of shelter or livelihood.

**"Tenants"**: are those persons having *bonafide* tenancy agreements, written or unwritten, with a private property owner with clear property titles, to occupy a structure or land for residence, business or other purposes. They are eligible for certain compensation or assistance as per the existing norms and practice.

**"Title holder"**: A PAP/PAF who has legal title to land, structures and other assets in the affected zone.

**"Vulnerable Group"**: defined as disabled, destitute, orphans, widows, unmarried girls, abandoned women or persons above 50 years of age; who are not provided or cannot immediately be provided with alternative livelihood, and who are not otherwise covered as part of a family.

**"Wage-earner"**: Wage earners are those whose livelihood would be affected due to the displacement of the employer.

# I. Social Screening Checklist

Name of the CBO:

Project Location- District/ Cluster/  
Taluka:

(Provide Latitude and Longitude  
information as well along with  
complete address)

Sub-project:

Proposed activities:

Extent of the land required for the  
project in acres / hectares:

Details:

| Land Use, Resettlement, and/or Land Acquisition |                                                                                                                                                                                                                                                        |     |    |        |
|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|--------|
| S.NO                                            | Components                                                                                                                                                                                                                                             | Yes | No | Detail |
| 1.                                              | Does the project involve acquisition of private land?                                                                                                                                                                                                  |     |    |        |
| 2.                                              | Alienation of any type of Government land including that owned by PRI/ Urban Local Body?                                                                                                                                                               |     |    |        |
| 3.                                              | Clearance of encroachment from Government/ Urban Local Body Land/ PRI Land?                                                                                                                                                                            |     |    |        |
| 4.                                              | Clearance of squatters/hawkers from Government/ Urban Local Body Land/ PRI Land?                                                                                                                                                                       |     |    |        |
| 5.                                              | Number of structures, both authorized and/or unauthorized to be acquired/ cleared?                                                                                                                                                                     |     |    |        |
| 6.                                              | Number of household to be displaced?                                                                                                                                                                                                                   |     |    |        |
| 7.                                              | Details of village common properties to be alienated Pasture Land (acres) Cremation/ burial ground and others specify?                                                                                                                                 |     |    |        |
| 8.                                              | Describe existing land uses on and around the project area (e.g., community facilities, agriculture, tourism, private property)?                                                                                                                       |     |    |        |
| 9.                                              | Will the project result in the permanent or temporary loss of the following? Specify with numbers Crops, Fruit trees / coconut palms, Petty Shops/ Kiosks, Vegetable / Fish / Meat vending, Cycle repair shop, Garage, Tea Stalls, Grazing Lands, etc. |     |    |        |
| 10.                                             | Is the project likely to provide local employment opportunities, including employment opportunities for women?                                                                                                                                         |     |    |        |

|     |                                                                                                                                                                                                                                                                                    |  |  |  |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
| 11. | Is the project being planned with sufficient attention to local poverty alleviation objectives?                                                                                                                                                                                    |  |  |  |
| 12. | Is the project being designed with sufficient local participation (including the participation of women) in the planning, design, and implementation process?                                                                                                                      |  |  |  |
| 13. | Population proposed to be benefitted by the proposed project                                                                                                                                                                                                                       |  |  |  |
| 14. | No. of Females proposed to be benefitted by the proposed project                                                                                                                                                                                                                   |  |  |  |
| 15. | Vulnerable households /population to be benefitted                                                                                                                                                                                                                                 |  |  |  |
| 16. | No. of BPL Families to be benefitted                                                                                                                                                                                                                                               |  |  |  |
| 17. | Are there socio-cultural groups present in or use the subproject area who may be considered as "tribes" (hill tribes, schedules tribes, tribal peoples), "minorities" (ethnic or national minorities), or "indigenous communities" in the subproject area?                         |  |  |  |
| a.  | Are there national or local laws or policies as well as anthropological researches/studies that consider these groups present in or using the subproject area as belonging to "ethnic minorities", scheduled tribes, tribal peoples, national minorities, or cultural communities? |  |  |  |
| b.  | Do such groups self-identify as being part of a distinct social and cultural group?                                                                                                                                                                                                |  |  |  |
| c.  | Do such groups maintain collective attachments to distinct habitats or ancestral territories and/or to the natural resources in these habitats and territories?                                                                                                                    |  |  |  |
| d.  | Do such groups maintain cultural, economic, social, and political institutions distinct from the dominant society and culture?                                                                                                                                                     |  |  |  |
| e.  | Do such groups speak a distinct language or dialect?                                                                                                                                                                                                                               |  |  |  |
| f.  | Have such groups been historically, socially and economically marginalized, disempowered, excluded, and/or discriminated against?                                                                                                                                                  |  |  |  |
| 18. | Are such groups represented as "Indigenous Peoples" or as "ethnic minorities" or "scheduled tribes" or "tribal populations" in any formal decision-making bodies at the national or local levels?                                                                                  |  |  |  |
| 19. | Will the subproject directly or indirectly benefit or target Indigenous Peoples?                                                                                                                                                                                                   |  |  |  |
| 20. | Will the subproject directly or indirectly affect Indigenous Peoples' traditional socio-cultural and belief practices? (e.g., child-rearing, health, education, arts, and governance)?                                                                                             |  |  |  |
| 21. | Will the subproject affect the livelihood systems of Indigenous Peoples? (e.g., food production system, natural resource management, crafts and trade, employment status)?                                                                                                         |  |  |  |
| 22. | Will the subproject be in an area (land or territory) occupied, owned, or used by Indigenous Peoples, and/or claimed as ancestral domain?                                                                                                                                          |  |  |  |

Verified and certified by safeguard specialist of the district

Name:

Designation:

Office:

Date:

## J. Format for Recording Consultations

|                  |  |                  |
|------------------|--|------------------|
| <b>District:</b> |  | <b>Village</b>   |
| <b>Date:</b>     |  | <b>Time:</b>     |
| <b>Venue:</b>    |  | <b>Duration:</b> |

### 1. Project Description

### 2. Issues raised by the community and responses provided

#### i. Issues

#### ii. Response by PIU/ PRI/ ULB

### 3. Key issues

i. \_\_\_\_\_

ii. \_\_\_\_\_

iii. \_\_\_\_\_

#### 4. Conclusion by PRI representatives

##### Suggested Content of Consultation sessions...

The meeting duration shall be for about 1-1/2 to 2 hours and shall cover the following.

All these steps of the consultation shall be recorded in the format

- I. ***The session shall start with a description of the project by the PIU officials to the community.*** The following information shall be covered:

Overview of SMART and criteria for selection

Involvement of PRIs & communities in project planning, design and implementation

Expectations of the project from the beneficiaries, the communities

Provisions of the project as the Resettlement Framework provisions, mechanisms for voluntary land donation process etc.

Census survey

Mechanisms for Grievances, implementation arrangements

Likely construction schedule

- II. **After the description of the project, suggestions from the community on the project and issues will be obtained**
- III. **Responses to the issues raised will be provided by the PIU, PRI during the meeting.** For issues that require a visit to the site or involves certain engineering decisions, or consultations with other Government agencies, a date shall be committed for response to the same. The response shall be given by the PIU to the PRI within the specified date.
- IV. **The PIU shall summarize the issues**
- V. **Conclusion by the PRI representatives and attendance of the participants**

On a separate sheet mark the attendance at the meeting in the following format

|           |         |
|-----------|---------|
| Community | PIU/PRI |
|-----------|---------|

| Name of Person and<br>Village of residence | Signature | Name and Designation of<br>Official | Signature |
|--------------------------------------------|-----------|-------------------------------------|-----------|
|                                            |           |                                     |           |
|                                            |           |                                     |           |
|                                            |           |                                     |           |

# K. Census & Socio-economic Survey Questionnaire

Project Coordinator

---

Household Identification number

---

Plot no./Patta No./Khasra No.

---

Head of Household (Name)

---

| Vulnerability <i>tick</i> ,<br><i>whether belong to</i> | SC | ST | Women<br>HH | Physically<br>challenged | BPL | Other |
|---------------------------------------------------------|----|----|-------------|--------------------------|-----|-------|
|                                                         |    |    |             |                          |     |       |

| If BPL, proof of BPL Ration Card | Yes | Card No. |
|----------------------------------|-----|----------|
|                                  | NO  |          |

|                                    |       |
|------------------------------------|-------|
| Household size (No. of persons)    | <hr/> |
| No. of earning adult members (Nos) | <hr/> |

| No. of dependents (Nos) | Adults   |
|-------------------------|----------|
|                         |          |
|                         | Children |
|                         |          |

| Nature of impact ( <i>tick</i> ) | Agriculture | Residence | Commercial | Other |
|----------------------------------|-------------|-----------|------------|-------|
|                                  |             |           |            |       |

|                            |           |
|----------------------------|-----------|
| Agriculture                | <Marginal |
| Size of Total holding (ha) | >Marginal |

|                                                                                                        |             |             |              |
|--------------------------------------------------------------------------------------------------------|-------------|-------------|--------------|
| Extent of Impact ( percent total land holding including any other land parcels owned elsewhere by PAP) | <10 percent | >10 percent | =100 percent |
| Size of residual holding (ha)                                                                          |             |             |              |

**Residence**

---

|                                 |       |
|---------------------------------|-------|
| Plot size (sqm)                 | <hr/> |
| Extent of impact (Full/Partial) | <hr/> |
| Impacted Area (sqm)             | <hr/> |

|                               |     |  |    |  |
|-------------------------------|-----|--|----|--|
| Residual plot viable (Yes/No) | Yes |  | NO |  |
|-------------------------------|-----|--|----|--|

|                                                   |  |     |    |                |
|---------------------------------------------------|--|-----|----|----------------|
| If No, Alternate house site (if relocation reqd.) |  | Yes | No | If yes Specify |
|                                                   |  |     |    |                |

|                           |       |
|---------------------------|-------|
| Commercial establishments | <hr/> |
| Plot size (sqm)           | <hr/> |

|                                  |  |      |  |         |  |
|----------------------------------|--|------|--|---------|--|
| Extent of impact ( <i>tick</i> ) |  | Full |  | Partial |  |
|----------------------------------|--|------|--|---------|--|

|                      |       |
|----------------------|-------|
| Impacted area (sqm.) | <hr/> |
|----------------------|-------|

|                                        |  |     |  |    |  |
|----------------------------------------|--|-----|--|----|--|
| Commercial Plot viable ( <i>tick</i> ) |  | Yes |  | No |  |
|----------------------------------------|--|-----|--|----|--|

|                                                           |  |     |    |                 |
|-----------------------------------------------------------|--|-----|----|-----------------|
| If No, Alternate commercial site (if relocation required) |  | Yes | NO | If yes, Specify |
|                                                           |  |     |    |                 |

|                                                            |       |
|------------------------------------------------------------|-------|
| <b>Asset Loss</b>                                          | <hr/> |
| Inventory assets lost (Trees, Wells, Handpump, CPRs, etc.) | <hr/> |

|                                                          |     |    |                 |
|----------------------------------------------------------|-----|----|-----------------|
| <b>Livelihood Loss</b>                                   | Yes | No | If yes, specify |
| Alternate livelihood sources, other than mentioned above |     |    |                 |

## Annexure AA: Format for Census Survey

### Annexure - A

#### FORMAT FOR SURVEY OF PROJECT AFFECTED HOUSEHOLDS

(for Titleholders (land donors)/ Non-Titleholders/ Squatter/ Encroacher/ Tenant)

---

1. Household Identification Number : .....

2. Plot No./Patta No./Khasra No. : .....

3. Name of the Head of the Household : .....

4. **Vulnerability** : Tick here if belong to any of the following:

Households Below Poverty Line<sup>1</sup> (BPL) as per the state poverty line for rural areas;

Households becoming BPL as a result of loss of asset and / or livelihood.

Households losing structure

Female headed household

Scheduled Caste

Scheduled Tribe

Disabled person

5. Household Size : .....

6. No. of Adult earning members : .....

7. No. of Dependents : .....

8. Annual Income (prior to donation) : .....

9. Nature of Impact :

Loss of Agriculture land

loss of Residence

Loss of Commercial Structure

Any Other (Specify) .....

10. Type of land:            1. Irrigated        2. Un-irrigated        3. Barren        4. Govt land

11. Type of structure:    1. Pucca        2. Semi Pucca        3. Kutcha

12. Category of Affected People: 1. Titleholder 2. Squatter 3. Encroacher 4. Tenant 5. Others (specify)

13. **Land**

13.1 Size of Total Land holding (in acres) : .....

13.2 Marginal farmer<sup>2</sup> :            (a) Yes            (b) No

13.3 Extent of impact (% of total land holding including any other land parcels owned elsewhere by the Affected People). Specify extent of Loss in the following: (Tick)

| Less than 5% | More than 5% - less than 10% | More than 10% - less than 15% | More than 15% - less than 20% | More than 20% - less than 25% | More than 25%..... |
|--------------|------------------------------|-------------------------------|-------------------------------|-------------------------------|--------------------|
|              |                              |                               |                               |                               |                    |

13.4 Size of the residual holding (in acres) : .....

<sup>1</sup> The determination of BPL households will be as per government certificate or BPL card holder.

<sup>2</sup> Marginal Farmer is defined as any landowner whose landholding size is less than the district average land holding size.

## Annexure - A

## 14. Residence

- 14.1 Plot size (in sq. m) : .....
- 14.2 Extent of impact (Full/partial) : .....
- 14.3 Impacted Area (in sq. m) : .....
- 14.4 Residual Plot viable : (a) Yes (b) No
- 14.5 If No, Alternate house site (if relocation required):

| Yes | No | If yes, specify |
|-----|----|-----------------|
|     |    |                 |

## 15. Commercial establishment

- 15.1 Plot size (in sq. m) : .....
- 15.2 Extent of impact (Full/partial) : .....
- 15.3 Impacted Area (in sq. m) : .....
- 15.4 Commercial Plot viable : (a) Yes (b) No
- 15.5 If No, Alternate commercial site (if relocation required):

| Yes | No | If yes, specify |
|-----|----|-----------------|
|     |    |                 |

## 16. Asset Loss

- 16.1 Inventory assets lost (Trees, Wells, hand pump, Common Property Resources etc.): .....
17. Livelihood Loss due to donation of asset (Rs. / year) : .....

- 17.1 Alternate livelihood sources, other than mentioned above:

| Yes | No | If yes, specify |
|-----|----|-----------------|
|     |    |                 |

- 17.2 If yes, annual income from alternate source? .....
- 17.3 Annual Income (in Rs) after donation of asset? .....

Enumerators Name & Designation

Signature

# L. Sample MoU formats

## Memorandum of Understanding (Land provided by Titleholder)

[for -----]

This memorandum of understanding is made on \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_ between Sri / Srimati \_\_\_\_\_ resident of \_\_\_\_\_ (hereinafter referred to as the 'First Party') and the Governor of (State) through Sri / Srimati \_\_\_\_\_ (designation, office address) \_\_\_\_\_ (hereinafter referred to as the 'Second Party')

These present witness as follows:

1. That the First Party is landowners with transferable right of \_\_\_\_\_ acres of land bearing plot numbers \_\_\_\_\_ in village \_\_\_\_\_ block \_\_\_\_\_, tehsil \_\_\_\_\_, district \_\_\_\_\_.
2. That the First Party has taken part in the consultation conducted by the Public Works Department, Government of Maharashtra, under the requirements of the State of Maharashtra Agribusiness and Rural Transformation Project (SMART) and has been made to understand the benefits of obtaining a road in the village / town under SMART.
3. That the First Party hereby grants to the Second Party, out of its free will, above said land for the construction and development of SMART Project road in the village / town \_\_\_\_\_ under \_\_\_\_\_ Panchayat for the benefit of public at large.
4. That the first party would not claim any compensation in the above said grant of land.
5. That the second party agrees to accept the above grant of land for the purposes mentioned in clause 3.
6. That the second party shall develop and construct the Road and take all possible precautions to avoid damage to land adjacent to SMART Project road.
7. That the first party also assures the second party that the first party will not indulge in wilful act of damaging the road or obstructing the movement of public and vehicles on the road.
8. That both the Parties hereto agree that the road so constructed / developed / shall be public premises.
9. That the provisions of the Memorandum of Understanding will come into force and effect from the date of signing of this deed.

IN WITNESS HEREOF, the parties hereto have signed this deed on the day and the year first above written:

Signature of the first party

Signature for and behalf of the second party

Witnesses:

Witnesses:

1

1

2

2

3

3

(Signature, name and address)

(Signature, name and address)

**Memorandum of Understanding (Non-Titleholder)**  
**(Squatter / Encroacher)**

[for roads]

This memorandum of understanding is made on \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_ between the persons listed below on the one part (hereinafter collectively referred to as the 'First Party') and the Governor of (State) through Sri / Srimati \_\_\_\_\_ (designation, office address) \_\_\_\_\_ (hereinafter referred to as the 'Second Party')

These present witness as follows:

1. That the First Party is the squatter / encroacher of Government land of the respective acres (or other units as applicable) of land as listed below in village \_\_\_\_\_ block \_\_\_\_\_, tehsil \_\_\_\_\_, district \_\_\_\_\_.
2. That the First Party has consulted the Public Works Department, Government of Maharashtra, under the requirements of the State of Maharashtra Agribusiness and Rural Transformation Project (SMART) and has been made to understand the benefits of obtaining a road in the village under SMART.
3. That the First Party willingly leave their existing land as detailed in the list below for the construction and development of SMART Project road in the village / town \_\_\_\_\_ under \_\_\_\_\_ Panchayat for the benefit of public at large on which they had encroached / squatted on to the land of the second party
4. That the first party would not claim any compensation in return of leaving their encroached / squatted land.
5. That the second party agrees to clause 3.
6. That the second party shall develop and construct the Road and take all possible precautions to avoid damage to land adjacent to SMART Project road.
7. That the first party also assures the second party that the first party will not indulge in wilful act of damaging the road or obstructing the movement of public and vehicles on the road.
8. That both the Parties hereto agree that the road so constructed / developed shall be public premises.
9. That the provisions of the Memorandum of Understanding will come into force and effect from the date of signing of this deed.

| S. No. | Name | Area encroached / squatted in acres | Description of land granted for SMART |
|--------|------|-------------------------------------|---------------------------------------|
|        |      |                                     |                                       |
|        |      |                                     |                                       |
|        |      |                                     |                                       |
|        |      |                                     |                                       |

(add as many more members who are giving up their claim on the above said land)

### Memorandum of Understanding (Land & Buildings)

This memorandum of understanding is made on \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_ between Sri/Srimati \_\_\_\_\_ resident of \_\_\_\_\_ (hereinafter referred to as "the First Party") and the (Name of the FPO/CBO and Address) through Sri/Srimati \_\_\_\_\_ (designation) \_\_\_\_\_ (hereinafter referred to as "the Second Party").

#### THESE PRESENTS WITNESS AS FOLLOWS:

1. That the First Party is landowners with transferable right of \_\_\_\_\_ acres of land bearing khasa Nos. \_\_\_\_\_ in village \_\_\_\_\_ block \_\_\_\_\_ revenue circle \_\_\_\_\_ district \_\_\_\_\_.
2. That the First Party has been consulted as per the requirements of the SMART and has been made to understand the benefits of the obtaining land/building for \_\_\_\_\_ (FPO/CBO/Market/Organization, etc.)
3. That the First Party grants the Second Party, out of its free will, above said land for the construction and development of Land/Building in the Village/Town \_\_\_\_\_ under \_\_\_\_\_ Panchayat/Town for the benefit of the members of the \_\_\_\_\_ (FPO/CBO/Market/Organization, etc.), and the public at large.
4. That the First Party would not claim any compensation against the above said grant of land.
5. That the Second Party agrees to accept the above grant of land for the purposes mentioned in clause 3.
6. That the Second Party shall develop land and the buildings and take all possible precautions to avoid damage adjacent to \_\_\_\_\_ (organization name) land/building.
7. That the First Party also assures the Second Party that the first party will not indulge in any willful act of damaging the land / building of the \_\_\_\_\_ (organization) or obstructing the movement of public and vehicle.
8. That both the parties hereto agree that \_\_\_\_\_ (name of the organization) Land / Building so developed / constructed shall be public premises.
9. That the provisions of the MEMORANDUM OF UNDERSTANDING will come into force and effect from the date of signing of this deed.

IN WITNESS WHEREOF the Parties hereto have signed this deed on the day and the year first above written.

Signature of First Party

Signature for and on behalf of the Second Party

Witness:

Witness:

1. \_\_\_\_\_

1. \_\_\_\_\_

2. \_\_\_\_\_

2. \_\_\_\_\_

**(Signature, name and address)**

**(Signature, name and address)**

## M. Screening Checklist

### SCREENING CHECKLIST – AGRICULTURE SECTOR

#### (NEW SUBPROJECTS)

#### STATE OF MAHARASHTRA AGRIBUSINESS AND RURAL TRANSFORMATION PROJECT

#### Basic Information

Name of Project:

Village:

Cluster:

Block:

District

Type of the Project:

Total Area:

Name of Monitor's:

Name of Supervisor:

#### **Section A: Project Siting**

| Will the Project :                                                                                                                                                                                                             | Yes | No | Specify/Remarks |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|-----------------|
| 1. Be located within or near environmentally sensitive areas like:<br>i. Forests (Protected / Reserve)<br>ii. Wetlands<br>iii. Threatened species<br>iv. Special area for protecting biodiversity<br>v. Cultural heritage site |     |    |                 |
| 2. Affect environmentally sensitive areas or critical habitats – wetlands, woodlots, natural forests, rivers, etc.)?                                                                                                           |     |    |                 |
| 3. Affect the indigenous biodiversity (flora and fauna)?                                                                                                                                                                       |     |    |                 |
| 4. Cause any loss or degradation of any natural habitats, either directly (through project works) or indirectly?                                                                                                               |     |    |                 |
| 5. Affect the aesthetic quality of the landscape?                                                                                                                                                                              |     |    |                 |
| 6. Cause soil erosion or degradation?                                                                                                                                                                                          |     |    |                 |
| 7. Have risk of deforestation?                                                                                                                                                                                                 |     |    |                 |
| 8. Divert the water resource from its natural course /location?                                                                                                                                                                |     |    |                 |
| 9. Cause ecological degradation resulting from modification of non-agricultural lands to agricultural lands?                                                                                                                   |     |    |                 |
| 10. Reduce people's access to the pasture, water, public services or other resources they depend on?                                                                                                                           |     |    |                 |

|                                                                                                                                                    |  |  |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
| 11. Cause any dislocation or involuntary resettlement of people?                                                                                   |  |  |  |
| 12. Cause social problems due to land tenure and use conflicts?                                                                                    |  |  |  |
| 13. Result in any type of human wildlife conflicts?                                                                                                |  |  |  |
| 14. Affect the natural drainage of the area?                                                                                                       |  |  |  |
| 15. Be located in a site vulnerable to major natural or induced hazards such as:<br>i. Landslides<br>ii. Flooding<br>iii. Storm<br>iv. Earthquakes |  |  |  |
| 16. Have approach to roads and what is its quality?                                                                                                |  |  |  |
| 17. Have suitable area for construction purposes?                                                                                                  |  |  |  |

### **Section B: Constructional Impacts (w.r.t Infrastructure requirements)**

| <b>Will the Project cause:</b>                                                                                                                                                        | <b>Yes</b> | <b>No</b> | <b>Specify/Remarks</b> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------|------------------------|
| 1. Noise from construction?                                                                                                                                                           |            |           |                        |
| 2. Air pollution from the construction?                                                                                                                                               |            |           |                        |
| 3. Water pollution from the constructional activities?                                                                                                                                |            |           |                        |
| 4. Soil contamination and degradation due to construction?                                                                                                                            |            |           |                        |
| 5. Risk and vulnerabilities related to occupational health and safety due to physical chemical and biological hazards during project construction and operation?                      |            |           |                        |
| 6. Large population influx during project construction and operation that cause increased burden on social infrastructure and services (such as water supply and sanitation systems)? |            |           |                        |
| 7. Social conflicts if workers from other regions are hired?                                                                                                                          |            |           |                        |
| 8. Any generation of construction and disposal wastes?                                                                                                                                |            |           |                        |

### **Section C: Potential Environmental Impacts**

| <b>Will the Project cause:</b>                                                                                   | <b>Yes</b> | <b>No</b> | <b>Specify/Remarks</b> |
|------------------------------------------------------------------------------------------------------------------|------------|-----------|------------------------|
| 1. Any type of accidental damage?                                                                                |            |           |                        |
| 2. Downstream water pollution from discharge of contaminated water from the agricultural field with drain water? |            |           |                        |
| 3. Reduction of water supplies from competing uses (e.g., irrigation or domestic)?                               |            |           |                        |
| 4. Pollution in nearby aquatic environments from adequate farm management?                                       |            |           |                        |

| Will the Project cause:                                                                                                                                                                            | Yes | No | Specify/Remarks |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|-----------------|
| 5. Threat to local varieties of crops and vegetables by introduction of new genetically modified varieties?                                                                                        |     |    |                 |
| 6. Spread of diseases from exotic cultivated species?                                                                                                                                              |     |    |                 |
| 7. Reduction of water available to downstream users during peak seasons?                                                                                                                           |     |    |                 |
| 8. Risk to community health and safety due to transport, storage and use and/or disposal of materials likely to create physical chemical and biological hazards during construction and operation? |     |    |                 |
| 9. Air emission due to operation of D.G sets, boiler or burning of fuel for any other processing related activity.                                                                                 |     |    |                 |
| 10. Introduced mechanism to avoid burning of crop residue and adopted suitable mechanism for its sound reuse?                                                                                      |     |    |                 |
| 11. Introduced mechanism for safe and scientific disposal of empty chemical pesticide containers?                                                                                                  |     |    |                 |
| 12. Introduced mechanism to ensure levels of pesticide residue below MRL levels?                                                                                                                   |     |    |                 |
| 13. Noise impact due to operation of D.G sets and other cleaning, grading and packaging machineries in CBOs                                                                                        |     |    |                 |
| 14. Introduced 3 – 5-star rating electrical and electronic equipment for energy conservation?                                                                                                      |     |    |                 |
| 15. Introduced usage of solar energy to the extent possible?                                                                                                                                       |     |    |                 |
| 16. Introduced covered and well drained shelter with good hygienic condition for goat and sheep rearing?                                                                                           |     |    |                 |
| 17. Introduced stall feeding for goat and sheep rearing?                                                                                                                                           |     |    |                 |
| 18. Introduced improved feed to reduce methane emission due to goat and sheep rearing?                                                                                                             |     |    |                 |

**Section D: Seeds, Chemicals and Waste Disposal**

| Will the Project :                                                                                          | Yes | No | Specify/Remarks |
|-------------------------------------------------------------------------------------------------------------|-----|----|-----------------|
| 1. Involve the use of chemicals/ fertilizers/pesticides, or increase existing use?                          |     |    |                 |
| 2. Cause contamination of water courses by chemicals/fertilizers/pesticides?                                |     |    |                 |
| 3. Cause contamination of soil by chemicals/fertilizers/ pesticides or affect soil salinity and alkalinity? |     |    |                 |
| 4. Require scheduled chemical application?                                                                  |     |    |                 |
| 5. Introduce new varieties of seeds?                                                                        |     |    |                 |
| 6. Experience effluent and /or emissions discharge?                                                         |     |    |                 |
| 7. Introduce waste management and disposal practices?                                                       |     |    |                 |
| 8. Introduce integrated pest management practices?                                                          |     |    |                 |
| 9. Introduced Soil Health Card to all the farmer members?                                                   |     |    |                 |

## SCREENING CHECKLIST – ENTERPRISE SECTOR

### STATE OF MAHARASHTRA AGRIBUSINESS AND RURAL TRANSFORMATION PROJECT

#### Basic Information

Name of Project:

Village:

Cluster:

Block:

District

Type of the Project:

Total Area:

Name of Monitor's:

Name of Supervisor:

#### Section A: Project Siting

| Will the Project :                                                                                                                                                                                                       | Yes | No | Specify/Remarks |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|-----------------|
| 1. Be located within or near environmentally sensitive areas like:<br>i. intact natural forests<br>ii. wetlands<br>iii. Threatened species<br>iv. Special area for protecting biodiversity<br>v. Cultural heritage site? |     |    |                 |
| 2. Affect environmentally sensitive areas or critical habitats – wetlands, woodlots, natural forests, rivers, etc.)?                                                                                                     |     |    |                 |
| 3. Affect the indigenous biodiversity (flora and fauna)?                                                                                                                                                                 |     |    |                 |
| 4. Cause any loss or degradation of any natural habitats, either directly (through project works) or indirectly?                                                                                                         |     |    |                 |
| 5. Affect the aesthetic quality of the landscape?                                                                                                                                                                        |     |    |                 |
| 6. Cause soil erosion or degradation?                                                                                                                                                                                    |     |    |                 |
| 7. Have risk of deforestation?                                                                                                                                                                                           |     |    |                 |
| 8. Divert the water resource from its natural course / location?                                                                                                                                                         |     |    |                 |
| 9. Cause any dislocation or involuntary resettlement of people?                                                                                                                                                          |     |    |                 |
| 10. Cause social problems due to land tenure and use conflicts?                                                                                                                                                          |     |    |                 |
| 11. Affect the natural drainage of the area?                                                                                                                                                                             |     |    |                 |

| Will the Project :                                                                                                                                 | Yes | No | Specify/Remarks |
|----------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|-----------------|
| 12. Be located in a site vulnerable to major natural or induced hazards such as:<br>i. Landslides<br>ii. Flooding<br>iii. Storm<br>iv. Earthquakes |     |    |                 |
| 13. Have approach to roads and what is its quality?                                                                                                |     |    |                 |
| 14. Have suitable area for construction purposes?                                                                                                  |     |    |                 |

**Section B: Constructional Impacts(w.r.t Infrastructure requirements)**

| Will the Project cause:                                                                                                                                                               | Yes | No | Specify/Remarks |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|-----------------|
| 1. Noise from construction?                                                                                                                                                           |     |    |                 |
| 2. Air pollution from the construction?                                                                                                                                               |     |    |                 |
| 3. Water pollution from the constructional activities?                                                                                                                                |     |    |                 |
| 4. Soil contamination and degradation due to construction?                                                                                                                            |     |    |                 |
| 5. Risk and vulnerabilities related to occupational health and safety due to physical chemical and biological hazards during project construction and operation?                      |     |    |                 |
| 6. Large population influx during project construction and operation that cause increased burden on social infrastructure and services (such as water supply and sanitation systems)? |     |    |                 |
| 7. Social conflicts if workers from other regions are hired?                                                                                                                          |     |    |                 |
| 8. Any generation of construction and disposal wastes?                                                                                                                                |     |    |                 |

**Section C: Potential Environmental Impacts**

| Will the Project cause:                                                                                                                                                                            | Yes | No | Specify/Remarks |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|-----------------|
| 1. Any type of accidental damage?                                                                                                                                                                  |     |    |                 |
| 2. Downstream water pollution from discharge of contaminated water from the enterprise with drain water?                                                                                           |     |    |                 |
| 3. Reduction of water available to downstream users during peak seasons?                                                                                                                           |     |    |                 |
| 4. Risk to community health and safety due to transport, storage and use and/or disposal of materials likely to create physical chemical and biological hazards during construction and operation? |     |    |                 |

|                                                                                                                                    |  |  |  |
|------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
| 5. Air emission due to operation of machineries such as D.G sets                                                                   |  |  |  |
| 6. Noise generation due to operation of machineries                                                                                |  |  |  |
| 7. Energy rating of the equipment used in the project?<br>( <i>equipment used much have a star rating of 3 to 5 star rating.</i> ) |  |  |  |
| 8. Usage of solar energy and its extend in the project.                                                                            |  |  |  |

**Section D: Chemicals and Waste Disposal**

| Will the Project :                                                                                 | Yes | No | Specify/Remarks |
|----------------------------------------------------------------------------------------------------|-----|----|-----------------|
| 1. Involve the use of chemicals/ preservatives, or increase existing use?                          |     |    |                 |
| 2. Cause contamination of water courses by chemicals/preservatives?                                |     |    |                 |
| 3. Cause contamination of soil by chemicals/ preservatives or affect soil salinity and alkalinity? |     |    |                 |
| 4. Experience effluent and /or emissions discharge?                                                |     |    |                 |
| 5. Introduce waste management and disposal practices?                                              |     |    |                 |

**Section E: Compliance with IFC Performance Standard**

| Will the Project:                                                                                                                                                                                                                                                                                                                                                             | Yes | No | Specify/Remarks |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|-----------------|
| 1. Does the Enterprise have mechanism for assessment and management of environmental and social risk and Impacts?<br>( <i>Policy, mechanism for identification of risk and impacts, management programs, emergency preparedness plan, monitoring and review, stakeholder engagement plan, external communication and grievance mechanism and reporting to the community</i> ) |     |    |                 |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
| <p>2. Does the Enterprise have mechanism for sound worker management relations ship?<br/> <i>(Human Resource Policy for management of workers, working condition and terms of employment, permission for workers union, non-discrimination and equal opportunity, grievance mechanism, policy against child labor, bounded labor, occupational health and safety and efforts for its compliance with workers engaged by third party and supply chain.)</i></p>           |  |  |  |
| <p>3. Does the Enterprise have mechanism or approach to resource efficiency and pollution prevention?<br/> <i>(Mechanism to achieve resource efficiency, reduction in GHG emission, water conservation measures, waste minimization techniques, hazardous material management mechanism, pesticide use and its management)</i></p>                                                                                                                                       |  |  |  |
| <p>4. Does the Enterprise have Mechanism to minimize risk and impacts to the community health?<br/> <i>(Evaluate risk and impact to health and safety of affected community, good industrial practices, compliance with EHS guidelines, infrastructure and equipment design and safety, Hazardous material management and safety, community exposure to disease, principles of proportionality and good international practices while hiring security personel.)</i></p> |  |  |  |
| <p>5. Does the Enterprise policy or guideline for land acquisition and involuntary resettlement?<br/> <i>(Community engagement, resettlement and livelihood restoration planning and implementation)</i></p>                                                                                                                                                                                                                                                             |  |  |  |
| <p>6. Does the Enterprise has mechanism for biodiversity conservation and sustainable management of living natural resources?</p>                                                                                                                                                                                                                                                                                                                                        |  |  |  |
| <p>7. Does the Enterprise have policy to address and involve Indigenous People?<br/> <i>(Avoidance of adverse Impact, participation and consent, free prior and informed consent, mitigation and developmental benefits)</i></p>                                                                                                                                                                                                                                         |  |  |  |
| <p>8. Does the Enterprise have mechanism for protection of cultural heritage sites and equitable sharing of benefits from the usage of cultural heritage?<br/> <i>(protection of cultural heritage in project design and execution)</i></p>                                                                                                                                                                                                                              |  |  |  |

# N. Monitoring Format

## N.1 Monitoring Format for CBOs

| Name of CBO: |                                                                                                                       |        |                   |                                  |                |         |
|--------------|-----------------------------------------------------------------------------------------------------------------------|--------|-------------------|----------------------------------|----------------|---------|
| Address:     |                                                                                                                       |        |                   |                                  |                |         |
| Contact      |                                                                                                                       |        |                   |                                  |                |         |
| S. No        | Parameters                                                                                                            | Target | Baseline Scenario | Status as on Previous monitoring | Current Status | Remarks |
| 1            | percent of Farmers having Soil Health Card                                                                            |        |                   |                                  |                |         |
| 2            | percent of Farmers received training for Pesticide Usage, banned pesticides, usage of PPE, climate change impacts etc |        |                   |                                  |                |         |
| 3            | percent of Farmers Using Bio-pesticides                                                                               |        |                   |                                  |                |         |
| 4            | percent of Farmers received training on proper disposal of empty pesticide containers                                 |        |                   |                                  |                |         |
| 5            | percent of Farmers received training on back yard Farming for goat and sheep rearing for hygienic                     |        |                   |                                  |                |         |
| 6            | percent of Farmers making alternative use of crop residue or than burning.                                            |        |                   |                                  |                |         |
| 7            | percent of Farmers / transporters using Bharat Stage IV and above compliant vehicles                                  |        |                   |                                  |                |         |
| 8            | percent of Farmers received training on IPM                                                                           |        |                   |                                  |                |         |

|    |                                                                                           |  |  |  |  |  |
|----|-------------------------------------------------------------------------------------------|--|--|--|--|--|
| 9  | Does the CBO have Food Safety Testing Facility?                                           |  |  |  |  |  |
| 10 | Does the CBO has 3 star or above rating electrical and electronic machineries?            |  |  |  |  |  |
| 11 | Does the CBO follow Guidelines on clearance procedure for food and agri imports to India? |  |  |  |  |  |

## N.2 Monitoring Format for Slaughter Houses

| No. | Slaughter house Name | Good Industrial Practice for Slaughter House is part of Contract Documents (Y/N) | EMP Being Implemented (Y/N) | Status of Implementation (Excellent/ Satisfactory/Partially Satisfactory/ Below Satisfactory) | Action Proposed and Additional Measures Required |
|-----|----------------------|----------------------------------------------------------------------------------|-----------------------------|-----------------------------------------------------------------------------------------------|--------------------------------------------------|
|     |                      |                                                                                  |                             |                                                                                               |                                                  |
|     |                      |                                                                                  |                             |                                                                                               |                                                  |
|     |                      |                                                                                  |                             |                                                                                               |                                                  |

## N.3 Monitoring Format for Enterprises

| Name of Enterprise: |                                               |        |                   |                                  |                |         |
|---------------------|-----------------------------------------------|--------|-------------------|----------------------------------|----------------|---------|
| Address:            |                                               |        |                   |                                  |                |         |
| Contact             |                                               |        |                   |                                  |                |         |
| S. No               | Parameters                                    | Target | Baseline Scenario | Status as on Previous monitoring | Current Status | Remarks |
| 1                   | Does the Enterprise have Valid FSSAI License? |        |                   |                                  |                |         |

|   |                                                                                                          |  |  |  |  |  |
|---|----------------------------------------------------------------------------------------------------------|--|--|--|--|--|
| 2 | Does the Enterprise have a valid Consent from the Pollution Control Board ?                              |  |  |  |  |  |
| 3 | Does the Enterprise have License under Factory Act?                                                      |  |  |  |  |  |
| 4 | Does the Enterprise conduct regular monitoring of Ambient air quality, effluent quality and noise level? |  |  |  |  |  |
| 5 | Does the Enterprise have arrangement for scientific disposal of waste generated?                         |  |  |  |  |  |
| 6 | Does the enterprise used 3 star or above rating electronic equipment?                                    |  |  |  |  |  |

#### N.4 Monitoring Format for Market

| No. | Name of Market | Does the Market have arrangement for management of solid waste (Y/N) | Does the Market have air pollution control arrangement for D.G set (Y/N) | Status of Implementation (Excellent/ Satisfactory/Partially Satisfactory/ Below Satisfactory) | Action Proposed and Additional Measures Required |
|-----|----------------|----------------------------------------------------------------------|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|--------------------------------------------------|
|     |                |                                                                      |                                                                          |                                                                                               |                                                  |
|     |                |                                                                      |                                                                          |                                                                                               |                                                  |
|     |                |                                                                      |                                                                          |                                                                                               |                                                  |

## N.5 Construction Monitoring Format

| <b>No.</b> | <b>Subproject Name</b> | <b>EMP Part of Contract Documents (Y/N)</b> | <b>EMP Being Implemented (Y/N)</b> | <b>Status of Implementation (Excellent/Satisfactory/Partially Satisfactory/Below Satisfactory)</b> | <b>Action Proposed and Additional Measures Required</b> |
|------------|------------------------|---------------------------------------------|------------------------------------|----------------------------------------------------------------------------------------------------|---------------------------------------------------------|
|            |                        |                                             |                                    |                                                                                                    |                                                         |
|            |                        |                                             |                                    |                                                                                                    |                                                         |
|            |                        |                                             |                                    |                                                                                                    |                                                         |

## O. Template for Environmental Baseline Database – Agricultural Value Chain

### Template for SMART Project's Environmental Baseline Database Requirement from the Agricultural Value Chain Subproject Partnership Plans

#### A. Production Stage

##### A.1. Basic Production Related Information for the Given Agricultural Commodity (ies)

| Sr No. | Enlist Name of the Agricultural Commodity (ies) | Production Through- Agrochemicals or Organic Method | Total Area under Production in Ha | Quantity Produced in Tons/Ha/Yr | Irrigation Type- Rain fed/Canal/ Drip/Sprinkler | Water Requirement for Irrigation in (litres/Ha or m <sup>3</sup> /Ha per Yr |
|--------|-------------------------------------------------|-----------------------------------------------------|-----------------------------------|---------------------------------|-------------------------------------------------|-----------------------------------------------------------------------------|
| 1.     |                                                 |                                                     |                                   |                                 |                                                 |                                                                             |
| 2.     |                                                 |                                                     |                                   |                                 |                                                 |                                                                             |
| 3.     |                                                 |                                                     |                                   |                                 |                                                 |                                                                             |

##### A.2. Maximum Residue Limit (MRL) Compliance for Export and Local Markets

###### For Agro-Chemicals Usage- Pesticides/Insecticides/Weedicides

|              |                                  | To be Filled In By the CBOs/Enterprises                                               |                                         |                                                             |                               | To be Filled In By SMART Env. Expert            |                                                 |
|--------------|----------------------------------|---------------------------------------------------------------------------------------|-----------------------------------------|-------------------------------------------------------------|-------------------------------|-------------------------------------------------|-------------------------------------------------|
| Sr No.       | Name of the Agro-Chemical's Used | Name of the Target Pest(s) and Frequency of Attack (Frequent-Annual/biennial or Rare) | Type- Pesticide/ Insecticide/ Weedicide | Quantity Applied Solid- (kg/ha/yr)<br><br>Liquid (ml/ha/yr) | Price (INR/Kg) or (INR/Litre) | MRL (Mg/Kg) Prescribed by FSSAI Regulation 2011 | <u>Actual</u><br><br>Above MRL<br><br>Below MRL |
| 1.           |                                  |                                                                                       |                                         |                                                             |                               |                                                 |                                                 |
| 2.           |                                  |                                                                                       |                                         |                                                             |                               |                                                 |                                                 |
| 3.           |                                  |                                                                                       |                                         |                                                             |                               |                                                 |                                                 |
| <b>Total</b> |                                  |                                                                                       |                                         |                                                             |                               |                                                 |                                                 |

##### A. 3. For Fertilizers- Synthetic, Organic Fertilizer or Both (Represent Separately)

| Sr No.       | Name of the Synthetic Agro /Organic Fertilizer | Type- Synthetic or Organic Fertilizer | Quantity Applied |                   | Price (INR/Kg) or (INR/Litre) | Whether Soil Health Card (SHC)– Issued/Not-Issued | Whether Fertigation done as per SHC |
|--------------|------------------------------------------------|---------------------------------------|------------------|-------------------|-------------------------------|---------------------------------------------------|-------------------------------------|
|              |                                                |                                       | Solid (kg/ha/yr) | Liquid (ml/ha/yr) |                               |                                                   |                                     |
| 1.           |                                                |                                       |                  |                   |                               |                                                   |                                     |
| 2.           |                                                |                                       |                  |                   |                               |                                                   |                                     |
| 3.           |                                                |                                       |                  |                   |                               |                                                   |                                     |
| <b>Total</b> |                                                |                                       |                  |                   |                               |                                                   |                                     |

#### A.4 For Pest Management and Training Need Assessment

| Sr No. | Name of the Agri-Commodity (ies) | Number of IPM Demonstrations Done (if any) | Area in Ha Brought under IPM | Number of INM Demonstrations Done (if any) | Area in Ha Brought under INM |
|--------|----------------------------------|--------------------------------------------|------------------------------|--------------------------------------------|------------------------------|
| 1.     |                                  |                                            |                              |                                            |                              |
| 2.     |                                  |                                            |                              |                                            |                              |
| 3.     |                                  |                                            |                              |                                            |                              |

#### A.5. Waste Production

| Sr No.       | Type of Waste Generated                                                                 | Quantity Produced (tons/ha/yr) | Is it Reused on Field? (Yes/No) | Purpose of Reuse     |                   | Disposal Method                  |                              |
|--------------|-----------------------------------------------------------------------------------------|--------------------------------|---------------------------------|----------------------|-------------------|----------------------------------|------------------------------|
|              |                                                                                         |                                |                                 | Storage and Cleaning | Field Application | Open Dumping/ Underground Burial | Collection by Supplier/ CBOs |
| 1.           | Biodegradable Waste – Plant Residue (stalks, bagasse, drops and pruning's)              |                                |                                 |                      |                   |                                  |                              |
| 2.           | Non-Biodegradable Waste (Pesticide/Fertilizer Plastic Containers, Plastic Bags, Sheets) |                                |                                 |                      |                   |                                  |                              |
| <b>Total</b> |                                                                                         |                                |                                 |                      |                   |                                  |                              |

#### A. 6. Area brought under GLOBAL G.A.P. (Good Agriculture Practices) Certification or INDGAP Certification whichever is applicable: ..... (Ha)

## B. Harvesting and Storage Stage- SMART Support for Equipment's and Technologies

| Sr No | Name of the Harvesting, Storage Activity and/or Operation Machinery | Name of the Machinery Used Ex: Thresher/Combined Harvester/DG Set/Cold Storage | Diesel/Petrol Consumed in (litres / ton of agri-produce) | Electricity Consumed in (kWh / ton of agri-produce) | Source of Electricity- Grid Supply/Solar/Co-generation (Within Unit) |
|-------|---------------------------------------------------------------------|--------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------------|----------------------------------------------------------------------|
| 1.    |                                                                     |                                                                                |                                                          |                                                     |                                                                      |
| 2.    |                                                                     |                                                                                |                                                          |                                                     |                                                                      |

## C. Transportation Stage

| Sr No. | Purpose of Transportation |                   | Mode of Transportation used- Truck/Van/ Tempo/Bullock Cart/Others | Average Distance Travelled in Kms per Trip | Type of Fuel- Diesel/ Petrol | Quantity of Fuel Used in Litres/Km | Average price of the Fuel in INR/Litre |
|--------|---------------------------|-------------------|-------------------------------------------------------------------|--------------------------------------------|------------------------------|------------------------------------|----------------------------------------|
|        | From                      | To                |                                                                   |                                            |                              |                                    |                                        |
| 1.     | Field Production          | Aggregation Point |                                                                   |                                            |                              |                                    |                                        |
| 2.     | Aggregation               | Processing        |                                                                   |                                            |                              |                                    |                                        |
| 3.     | Processing                | Trader/ Retailer  |                                                                   |                                            |                              |                                    |                                        |

## D. Processing Stage

| Sr No | Name of the Processing Activity- Ex: Cleaning/Boiling/ Drying Grading/Sorting or any Other (Pls name it) | Name of the Machinery Used | Diesel/Petrol/ furnace oil Consumed in litres / ton of agri-produce) | Electricity Consumed in (kWh / ton of agri-produce) | Source of Electricity - Grid Supply/Solar/Co-generation (Within Unit) | Quantity of Waste Produced in Processing Activities ( tons/ ton of agricultural produce) | Quantity of Waste Water Produced in Processing Activities (litres / ton of agricultural produce) |
|-------|----------------------------------------------------------------------------------------------------------|----------------------------|----------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------------------|------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| 1.    |                                                                                                          |                            |                                                                      |                                                     |                                                                       |                                                                                          |                                                                                                  |
| 2.    |                                                                                                          |                            |                                                                      |                                                     |                                                                       |                                                                                          |                                                                                                  |

## P.Template for Environmental Baseline Database – Animal Husbandry

### Template for SMART Project's Environmental Baseline Database Requirement from the Animal Husbandry Subproject Partnership Plans

#### A. Production Stage

##### A.1. Basic Goat (Ruminant) Production Related Information

| Sr No. | Ruminant Type | Name of the Goat Breeds | Total Nos. of Goat's being Reared | Average Age of Tradable Goat | Avg. Area of Goat Enclosure in m <sup>2</sup> | Type of Feeding Practices |                 |           | Type of Silage          |                  |
|--------|---------------|-------------------------|-----------------------------------|------------------------------|-----------------------------------------------|---------------------------|-----------------|-----------|-------------------------|------------------|
|        |               |                         |                                   |                              |                                               | Free Grazing (FG)         | Semi-Stall (SS) | Stall (S) | Grass and Forest Litter | Maize and Cereal |
| 1.     |               |                         |                                   |                              |                                               |                           |                 |           |                         |                  |
| 2.     |               |                         |                                   |                              |                                               |                           |                 |           |                         |                  |

##### A.2. Maximum Residue Limit (MRL) Compliance for Export and Local Markets

##### For Antibiotic and Steroid Usage

| Sr No. | To be Filled In By the CBOs/Enterprises  |                                                         |                                                                                                 |                                                                   | To be Filled In By Partner & SMART Env. Expert             |                                         |
|--------|------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------------|-----------------------------------------|
|        | Average Body Weight of the Tradable Goat | Name of the Veterinary Drugs Administered used (if any) | Used for Treatment of – Bacterial/Viral/ Endo-parasitic diseases/ Ecto-parasitic diseases, etc. | Quantity Administered<br>Tablet (mg/animal)<br>Liquid (ml/animal) | Meat Maximum Residue Level (Mg/Kg) Prescribed by APEDA/WHO | <u>Actual</u><br>Above MRL<br>Below MRL |
| 1.     |                                          |                                                         |                                                                                                 |                                                                   |                                                            |                                         |
| 2.     |                                          |                                                         |                                                                                                 |                                                                   |                                                            |                                         |

##### A.3 For Good Production Practices- Training Need Assessment

| Sr No. | Goat Sheds/Housing           |                              | Source of Water for Goat's |                                      | Anti-mortem Inspection- Diseased Animal |               | Disposal of Carcass of the Diseased Animal and Disposal of dead foetus and placenta |         |
|--------|------------------------------|------------------------------|----------------------------|--------------------------------------|-----------------------------------------|---------------|-------------------------------------------------------------------------------------|---------|
|        | Ventilated or Not-Ventilated | Water-Drained or Not-Drained | Open-Ponds, Lakes, Rivers, | Quality Drinking Water in Goat Sheds | Separated from healthy one              | Not Separated | Burial                                                                              | Burning |
| 1.     |                              |                              |                            |                                      |                                         |               |                                                                                     |         |
| 2.     |                              |                              |                            |                                      |                                         |               |                                                                                     |         |

### B. Slaughtering of Goat(s), Waste and Waste Water Generation and Treatment

| Sr No. | Slaughter House License Requirement- FSSAI as per Food Safety (License and Registration of Food Business) Regulations 2011<br><br>Licensed (L)<br><br>Non Licensed (NL) | Quantity of Abattoir Solid Waste Generated in tons/day<br><br>(animal bones, horns, faeces, fat, trimmings, paunch content, etc.) | Disposal Method of Abattoir Solid Waste |                       | Quantity of Abattoir Waste Water Generated<br><br>(M <sup>3</sup> /day) or (Litres/day) | Effluent Treatment Plant (ETP)<br><br>Present (P)<br><br>Absent (A) | Quantity of Abattoir Waste Water Treated in the ETP<br><br>(M <sup>3</sup> /day) or (Litres/day) |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|-----------------------|-----------------------------------------------------------------------------------------|---------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
|        |                                                                                                                                                                         |                                                                                                                                   | Biomethanation (tons/day)               | Composting (tons/day) |                                                                                         |                                                                     |                                                                                                  |
| 1.     |                                                                                                                                                                         |                                                                                                                                   |                                         |                       |                                                                                         |                                                                     |                                                                                                  |
| 2.     |                                                                                                                                                                         |                                                                                                                                   |                                         |                       |                                                                                         |                                                                     |                                                                                                  |

### C. Processing- Post Slaughtering Stage

| Sr No | Name of the Processing Activity- Ex: Cleaning/ Freezing/ Packaging/Name any other activity in sequence | Which is the Gas Used in Refrigeration - Chilling/ Freezing Unit | Diesel Consumed in D.G. Sets<br><br>(litres / ton of meat) | Electricity Consumed in Processing<br><br>(kWh / ton of meat) | Type of Meat Packing Material Used- Carton, Boxes, Polybag | Quantity of Packing Material Used (Kgs/Day) or (Kgs/ ton of meat) | Method of disposal of Packing Waste (Open dumping/ Collection by Municipality) |
|-------|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------------------------|
| 1.    |                                                                                                        |                                                                  |                                                            |                                                               |                                                            |                                                                   |                                                                                |

|    |  |  |  |  |  |  |  |
|----|--|--|--|--|--|--|--|
| 2. |  |  |  |  |  |  |  |
|----|--|--|--|--|--|--|--|

#### D. Transportation Stage

| Sr No. | Purpose of Transportation |    | Mode of Transportation used- Truck/Van/ Tempo/Ship/Flight and Is the Vehicle Disinfected (Yes/No) | Average Distance Travelled in Kms per Trip to the Nearest Market | Type of Fuel- Diesel/Petrol/ Fuel Oil/Jet Fuel | Quantity of Fuel Used in Litres/Trip/Export to the Market/Trip | Average Local Price of the Fuel in INR/Litre |
|--------|---------------------------|----|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------|----------------------------------------------------------------|----------------------------------------------|
|        | From                      | To |                                                                                                   |                                                                  |                                                |                                                                |                                              |
| 1.     |                           |    |                                                                                                   |                                                                  |                                                |                                                                |                                              |
| 2.     |                           |    |                                                                                                   |                                                                  |                                                |                                                                |                                              |
| 3.     |                           |    |                                                                                                   |                                                                  |                                                |                                                                |                                              |

**E. Quality Control and Development:** Whether in-house lab and implementation of quality assurance system such as Hazard Analysis and Critical Control Point (HACCP) and ISO is Present (P)/Not Present (NP):\_\_\_\_\_. If Yes, then \_\_\_\_\_ tons of Goat meat is brought under quality control system for International (I)/Local (L) \_\_\_\_\_Market.

## Q. Maximum Residue Level Results

### Maximum Residue level

Ref - Food Safety Standards (contaminants ,toxins & residues )  
 Regulation 2011 & Pesticide Residue Testing laboratory Pune

Note - We have not mentioned the below MRL values ,(BLQ denotes for Below quantification level )we have only added the values which are exceeding the MRL levels.

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide                                                                     | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>R<br>L<br>) | Actual Values (AMRL) (mg /kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|-------------------------------------------------------------------------------|------------------------|------------------------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                                                                               |                        |                                                            |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1                 | Jowar<br>KH   | 2,4-Dichloro phenoxy acetic acid                                              | 0.01                   | BL<br>Q                                                    |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Sum of benomyl & carbendazim expressed as carbndazim                          | 0.5                    | BL<br>Q                                                    |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Carbaryl                                                                      | 1.5                    | BL<br>Q                                                    |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Carbendazim                                                                   | 0.1                    | BL<br>Q                                                    |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Carbofuran (sum of carbofuran & 3-hydroxy carbofuran expressed as carbofuran) | 0.1                    | BL<br>Q                                                    |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Chlopyriphos                                                                  | 0.05                   | BL<br>Q                                                    |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide                                                                                                                                                                    | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                                                                                                                                                                              |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Thiometon(Residues determined as thiometon its sulfoxide & sulphone expressed as thiometon)                                                                                  | 0.03                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Trichlorfon                                                                                                                                                                  | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Deltamethrin (Decamethrin)2                                                                                                                                                  |                        | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Dichlorvos (DDVP)(content of di-chloroacetaldehyde (D.C.A) be reported where possible )                                                                                      | 1                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Dithiocarbamates (the residue tolerance limit are determined & expressed as mg/CS2/kg & refer separately to the residues arising from any or each group of dithiocarbamates) | 0.2                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Ethion (Residues to be determined as ethion & its oxygen analogue & expressed as ethion)                                                                                     | 0.03                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Malathione (Malathione to be determined & expressed as combined residues of malathion & malaoxon)                                                                            | 4                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Monocrotophos                                                                                                                                                                | 0.03                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Oxydemeton -Methyl                                                                                                                                                           | 0.02                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Paraquat dichloride (Determined as paraquatcations)                                                                                                                          | 0.03                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Phenthoate                                                                                                                                                                   | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide                                                                                           | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|-----------------------------------------------------------------------------------------------------|------------------------|--------------------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                                                                                                     |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Phorate (sum of phorate ,its oxygen analogue & their sulphoxides & sulphones ,expressed as phorate) | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Pirimiphos -methyl                                                                                  | 7                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Emamectin Benzoate                                                                                  | 0.01                   |                                                        | 0.<br>0<br>6<br>5             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Denotefuron                                                                                         | 0.01                   |                                                        | 0.<br>2<br>9                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Buprofezin                                                                                          | 0.01                   |                                                        | 0.<br>0<br>3<br>6             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Imidaloprid                                                                                         | 0.01                   |                                                        | 0.<br>0<br>2<br>4             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2                 | Jowar<br>Rb   | 2,4-Dichloro phenoxy acetic acid                                                                    | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Sum of benomyl & carbendazim expressed as carbndazim                                                | 0.5                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Carbaryl                                                                                            | 1.5                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Carbendazim                                                                                         | 0.1                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Carbofuran (sum of carbofuran & 3-hydroxy carbofuran expressed as carbofuran)                       | 0.1                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide                                                                                                                                                                    | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                                                                                                                                                                              |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Chlopyriphos                                                                                                                                                                 | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Thiometon(Residues determined as thiometon its sulfoxide & sulphone expressed as thiometon)                                                                                  | 0.03                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Trichlorfon                                                                                                                                                                  | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Deltamethrin (Decamethrin)2                                                                                                                                                  |                        | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Dichlorvos (DDVP)(content of di-chloroacetaldehyde (D.C.A) be reported where possible )                                                                                      | 1                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Dithiocarbamates (the residue tolerance limit are determined & expressed as mg/CS2/kg & refer separately to the residues arising from any or each group of dithiocarbamates) | 0.2                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Ethion (Residues to be determined as ethion & its oxygen analogue & expressed as ethion)                                                                                     | 0.03                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Malathione (Malathione to be determined & expressed as combined residues of malathion & malaaxon)                                                                            | 4                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Monocrotophos                                                                                                                                                                | 0.03                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Oxydemeton -Methyl                                                                                                                                                           | 0.02                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Paraquat dichloride (Determined as paraquatcations)                                                                                                                          | 0.03                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide                                                                                           | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|-----------------------------------------------------------------------------------------------------|------------------------|--------------------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                                                                                                     |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Phenthoate                                                                                          | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Phorate (sum of phorate ,its oxygen analogue & their sulphoxides & sulphones ,expressed as phorate) | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Pirimiphos -methyl                                                                                  | 7                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               |                                                                                                     |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3                 | Wheat         | 2,4-Dichloro phenoxy acetic acid                                                                    | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Azoxystrobin                                                                                        | 0.2                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Bitertanol                                                                                          | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Carbaryl                                                                                            | 2                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Carbendazim                                                                                         | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Carfentrazone Ethyl                                                                                 | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Chlorimuron Ethyl                                                                                   | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Chlorpyriphos                                                                                       | 0.5                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Cypermethrin (sum of isomers)(Fat soluble residue)                                                  | 2                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Deltamethrin (Decamethrin)                                                                          | 2                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Dichlorvos (DDVP)(content of dichloroacetaldehyde (D.C.A.)be reported where possible)               | 7                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide                                                                                       | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|-------------------------------------------------------------------------------------------------|------------------------|--------------------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                                                                                                 |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Diclofop (sumdiclofop-methyl & diclofop acid expressed as diclofop-methyl)                      | 0.1                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Difenoconazole                                                                                  | 0.02                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Dithiocarbamates                                                                                | 1                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Epoxyconazole                                                                                   | 0.01<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fenoxaprop-p-ethyl                                                                              | 0.02                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fipronil                                                                                        | 0.01<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Iodosulfuron Methyl sodium                                                                      | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Isoproturon                                                                                     | 0.1                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Keroxim Methyl                                                                                  | 0.05<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Malathion (malathion to be determined & expressed as combined residues of malathion & malaoxon) | 10                     | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Mesosulfuron Methyl                                                                             | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Methabenzthiazuron                                                                              | 0.5                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Methyl Chlorophenoxy Acetic acid (MCPA)                                                         | 0.2                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Metribuzin                                                                                      | 0.03                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Metsulfuron Methyl                                                                              | 0.1                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide           | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg<br>/kg) |                   |                   |  |  |  |
|-------------------|---------------|---------------------|------------------------|--------------------------------------------------------|----------------------------------|-------------------|-------------------|--|--|--|
|                   |               |                     |                        |                                                        |                                  |                   |                   |  |  |  |
|                   |               | Oxydemeton-Methyl   | 0.02                   | BL<br>Q                                                |                                  |                   |                   |  |  |  |
|                   |               | Pendimethalin       | 0.05                   | BL<br>Q                                                |                                  |                   |                   |  |  |  |
|                   |               | Picoxystrobin       | 0.05<br>*              | BL<br>Q                                                |                                  |                   |                   |  |  |  |
|                   |               | Pinoxaden           | 0.7                    | BL<br>Q                                                |                                  |                   |                   |  |  |  |
|                   |               | Propiconazole       | 0.05                   | BL<br>Q                                                |                                  |                   |                   |  |  |  |
|                   |               | Pyraclostrobin      | 0.01<br>*              | BL<br>Q                                                |                                  |                   |                   |  |  |  |
|                   |               | Sulfosulfuron       | 0.02                   | BL<br>Q                                                |                                  |                   |                   |  |  |  |
|                   |               | Tebuconazole        | 0.15                   | BL<br>Q                                                |                                  |                   |                   |  |  |  |
|                   |               | Thiamethoxam        | 0.05                   | BL<br>Q                                                |                                  |                   |                   |  |  |  |
|                   |               | Thiophanate-Methyl  | 0.03<br>*              | BL<br>Q                                                |                                  |                   |                   |  |  |  |
|                   |               | Triadimefon         | 0.5                    | BL<br>Q                                                |                                  |                   |                   |  |  |  |
|                   |               | Trifloxystrobin     | 0.2                    | BL<br>Q                                                |                                  |                   |                   |  |  |  |
|                   |               | Triallate           | 0.05                   | BL<br>Q                                                |                                  |                   |                   |  |  |  |
|                   |               | Triasulfuron        | 0.01<br>*              | BL<br>Q                                                |                                  |                   |                   |  |  |  |
|                   |               | Tridemorph          | 0.1                    | BL<br>Q                                                |                                  |                   |                   |  |  |  |
|                   |               | Trifluralin         | 0.05                   | BL<br>Q                                                |                                  |                   |                   |  |  |  |
|                   |               | Chlorantraniliprole | 0.01                   |                                                        | 0.<br>0<br>2                     | 0.<br>0<br>1<br>6 | 0.<br>0<br>1<br>6 |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide                                                                                   | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg<br>/kg) |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|---------------------------------------------------------------------------------------------|------------------------|--------------------------------------------------------|----------------------------------|-------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                                                                                             |                        |                                                        |                                  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               |                                                                                             |                        |                                                        | 2                                |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Emamectin Benzoate                                                                          | 0.01                   |                                                        | 0.052                            | 0.019 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Buprofezin                                                                                  | 0.01                   |                                                        | 0.012                            |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               |                                                                                             |                        |                                                        |                                  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 4                 | Bajra         | 2,4-Dichloro phenoxy acetic acid                                                            | 2                      | BL<br>Q                                                |                                  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Sum of benomyl & carbendazim expressed as carbndazim                                        | 0.5                    | BL<br>Q                                                |                                  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Carbaryl                                                                                    | 1.5                    | BL<br>Q                                                |                                  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Carbendazim                                                                                 | 0.1                    | BL<br>Q                                                |                                  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Carbofuran (sum of carbofuran & 3-hydroxy carbofuran expressed as carbofuran)               | 0.1                    | BL<br>Q                                                |                                  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Chlopyriphos                                                                                | 0.05                   | BL<br>Q                                                |                                  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Thiometon(Residues determined as thiometon its sulfoxide & sulphone expressed as thiometon) | 0.03                   | BL<br>Q                                                |                                  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Trichlorfon                                                                                 | 0.05                   | BL<br>Q                                                |                                  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Deltamethrin (Decamethrin)2                                                                 |                        | BL<br>Q                                                |                                  |       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide                                                                                                                                                                    | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                                                                                                                                                                              |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Dichlorvos (DDVP)(content of di-chloroacetaldehyde (D.C.A) be reported where possible )                                                                                      | 1                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Dithiocarbamates (the residue tolerance limit are determined & expressed as mg/CS2/kg & refer separately to the residues arising from any or each group of dithiocarbamates) | 0.2                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Ethion (Residues to be determined as ethion & its oxygen analogue & expressed as ethion)                                                                                     | 0.03                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Spinosad                                                                                                                                                                     | 0.01                   |                                                        | 0.<br>0<br>2<br>9             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Imidacloprid                                                                                                                                                                 | 0.01                   |                                                        | 0.<br>0<br>1<br>0<br>4        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Lufenuron                                                                                                                                                                    | 0.01                   |                                                        | 0.<br>0<br>1<br>3             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Metribuzin                                                                                                                                                                   | 0.01                   |                                                        | 0.<br>0<br>1<br>7<br>9        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Chlorantraniliprole                                                                                                                                                          | 0.01                   |                                                        | 0.<br>1                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide                                                                                           | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg<br>/kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|-----------------------------------------------------------------------------------------------------|------------------------|--------------------------------------------------------|----------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                                                                                                     |                        |                                                        |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               |                                                                                                     |                        |                                                        | 9                                |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               |                                                                                                     |                        |                                                        | 7                                |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5                 | Rice          | Malathione (Malathione to be determined & expressed as combined residues of malathion & malaoxon)   | 4                      | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Monocrotophos                                                                                       | 0.03                   | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Oxydemeton -Methyl                                                                                  | 0.02                   | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Paraquat dichloride (Determined as paraquatcations)                                                 | 0.03                   | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Phenthoate                                                                                          | 0.05                   | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Phorate (sum of phorate ,its oxygen analogue & their sulphoxides & sulphones ,expressed as phorate) | 0.05                   | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Pirimiphos -methyl                                                                                  | 7                      | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Bensulfuron Methyl                                                                                  | 0.01                   | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Bifethrin                                                                                           | 0.05                   | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Bispyribac Sodium                                                                                   | 0.05                   | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Buprofezin                                                                                          | 0.05                   | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Butachlor                                                                                           | 0.05                   | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Captan                                                                                              | 0.3                    | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide                                                                                                                           | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|-------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                                                                                                                                     |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Carbaryl                                                                                                                            | 2.5                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Carbendazim                                                                                                                         | 2                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Carbosulfan                                                                                                                         | 0.2                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Carfentrazone Ethyl                                                                                                                 | 0.1                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Carproamid                                                                                                                          | 1                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Cartap hydrochloride                                                                                                                | 0.5                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Chlorantraniliprole                                                                                                                 | 0.4                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Chlorimuron Ethyl                                                                                                                   | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Chlothianidin (Chlothianidin & its metabolites Thiazolmethylguanidine (TMG), Thiazomethylurea(TZMU),M ethylnitroguanidine (MNG)TNG) | 0.5                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Chromafenozide                                                                                                                      | 0.03                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Cinmethylen                                                                                                                         | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Clomazone                                                                                                                           | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Copper Hydroxide (copper determined as elemental copper)                                                                            | §                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Cypermethrin (sum of isomers)(fat soluble residue)                                                                                  | 2                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Deltamethrin (Decamethrin)                                                                                                          | 2                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide        | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|------------------|------------------------|--------------------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                  |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Difenoconazole   | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Dinotefuran      | 8                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Edifenphos       | 0.02                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Epoxyconazole    | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Ethofenprox      | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Ethoxysulphuron  | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fenobucarb(BMPC) | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fenpropathrin    | 0.03<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fipronil         | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Flonicamid       | 0.05<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Flubendiamide    | 0.1                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Flufenacet       | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Flusilazole      | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Glyphosate       | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Hexaconazole     | 0.02                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Imidacloprid     | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Idoxacarb        | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Iprobenfos       | 0.2                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide                                                                                                                       | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|---------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                                                                                                                                 |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Iprodione                                                                                                                       | 10                     | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Isoprothiolane                                                                                                                  | 10                     | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Kasugamycin                                                                                                                     | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Lambda cyhalothrin                                                                                                              | 1                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Methyl chlophenoxy acetic acid (MCPA)                                                                                           | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Methyl parathion (combined residues of methyl parathion & its oxygen analogue to be determined & expressed as methyl parathion) | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Metsulphuron methyl                                                                                                             | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Oxadiazon                                                                                                                       | 0.03                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Oxyfluorfen                                                                                                                     | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Pencycuron                                                                                                                      | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Pendimethalin                                                                                                                   | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Penoxusum                                                                                                                       | 0.1*                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Picoxystrobin                                                                                                                   | 0.05*                  | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Pretilachor                                                                                                                     | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Pirimiphos-methyl                                                                                                               | 0.5                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Propiconazole                                                                                                                   | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide                   | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|-----------------------------|------------------------|--------------------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                             |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Propineb                    | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Pyraclostrobin              | 0.02<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Pyrazosulfuron Ethyl        | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Pymetrozine                 | 0.01<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Quinalphos                  | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Tebuconazole                | 1.5                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Thiocloprid                 | 0.02                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Thifluzamide                | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Thiamethoxam                | 0.02                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Tricyclazole                | 3                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Validamycin                 | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Propanil                    | 0.05<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Thiocyclam Hydrogen Oxalate | 0.01<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Bentazone                   | 0.05<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Flucetosulphuron            | 0.02<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fluxapyroxad                | 5                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Sulfoxaflor                 | 0.01<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide                  | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|----------------------------|------------------------|--------------------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                            |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6                 | Other millets | Carbaryl                   | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7                 | Red Gram      | Benfuracarb                | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Deltamethrin (Decamethrin) | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Lambda cyhalothrin         | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Pendimethalin              | 0.05<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Spinosad                   | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Thiodicarb                 | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Chlorantranilipro          | 0.01                   |                                                        | 0.<br>1<br>7<br>8             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Metribuzin                 | 0.01                   |                                                        | 0.<br>0<br>1<br>1<br>7        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 8                 | Green Gram    | Dithianon (Metiram as CS2) | 0.05<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 9                 | Black gram    | Captan                     | 0.01<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Chlorantraniliprole        | 0.03<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Dithianon (Metiram as CS2) | 0.05<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide                                                                                                                                   | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg<br>/kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|---------------------------------------------------------------------------------------------------------------------------------------------|------------------------|--------------------------------------------------------|----------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                                                                                                                                             |                        |                                                        |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fenoxaprop-p-ethyl                                                                                                                          | 0.01                   | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Flubendiamide                                                                                                                               | 1                      | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Hexaconazole                                                                                                                                | 0.01<br>*              | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Lefenuron                                                                                                                                   | 0.02<br>*              | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Methyl parathion (combined<br>residues of methyl parathion<br>& its oxygen analogue to be<br>determined & expressed as<br>methyl parathion) | 0.01                   | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Propaquizafop                                                                                                                               | 0.01                   | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Pyraclostrobin                                                                                                                              | 0.02<br>*              | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Quizalofop ethyl                                                                                                                            | 0.01<br>*              | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Tebuconazole                                                                                                                                | 0.01<br>*              | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Thiodicarb                                                                                                                                  | 0.03                   | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               |                                                                                                                                             |                        |                                                        |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1<br>0            | Gram          |                                                                                                                                             |                        |                                                        |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               |                                                                                                                                             |                        |                                                        |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1<br>1            | Cotton        | Chlorantraniliprole                                                                                                                         | 0.3                    | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Pyraclostrobin                                                                                                                              | 0.02<br>*              | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Carbendazim                                                                                                                                 | 0.01                   |                                                        | 0.<br>0<br>1<br>8                |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide            | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|----------------------|------------------------|--------------------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                      |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1<br>2            | Soyabe<br>an  | Alachor              | 0.1                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Beta Cyfluthrin      | 0.03                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Clodinafop-propargyl | 0.05<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Diclosulam           | 0.05<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Epoxyconazole        | 0.05<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fluazifop-p-butyl    | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Flubendiamide        | 0.07                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fluchloralin         | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Hexaconazole         | 0.00<br>2              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Imazethapyr          | 0.03                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Imidacloprid         | 3                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Indoxacarb           | 0.5                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Kresoxim Methyl      | 0.02<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Lambda cyhalothrin   | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Methomyl             | 0.2                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Permethrin           | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Picoxystrobin     | 0.05<br>*     | BL<br>Q              |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide                                                                                      | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|------------------------------------------------------------------------------------------------|------------------------|--------------------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                                                                                                |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Profenofos                                                                                     | 0.01<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Quinalphos                                                                                     | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Sodium Acefloufen                                                                              | 0.05<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Tebuconazole                                                                                   | 0.15                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Thiamethoxam                                                                                   | 0.05<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Triadimefon                                                                                    | 0.02<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fomesafen                                                                                      | 0.02<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Spinetoram & its metabolites<br>(Spinosyn -J & Spinosyn -L)                                    | 0.02                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Bentazone                                                                                      | 0.05<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Haloxyfop-R Methyl                                                                             | 2                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Sulfentrazone & its<br>metabolite<br>Desmethylsulfentrazone & 3-<br>hydroxymethylsulfentrazone | 0.2                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               |                                                                                                |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1<br>3            | Mango         | Alpha Naphthyl Acetic Acid                                                                     | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Azoxystrobin                                                                                   | 0.7                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Sum of benomyl &<br>carbendazim expressed as<br>carbendazim                                    | 2                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Buprofezin                                                                                     | 0.1                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide                  | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|----------------------------|------------------------|--------------------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                            |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Carbendazim                | 5                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Deltamethrin (Decamethrin) | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Dinocap                    | 0.1                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Mancozeb                   | 2                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Ethephon                   | 2                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Hexaconazole               | 0.02                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Imidacloprid               | 0.2                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Lambda cyhalothrin         | 0.2                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Paclobutrazol              | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Penconazole                | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Tebuconazole               | 0.2                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Thiamethoxam               | 0.2                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Triadimefon                | 0.03<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Trifloxystrobin            | 0.4                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Tridemorph                 | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Emamectin Benzoate         | 0.01                   | x<br>0.<br>9<br>7                                      |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide                  | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|----------------------------|------------------------|--------------------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                            |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1<br>4            | Cashew<br>nut |                            |                        | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1<br>5            | Grapes        | Alpha Naphthyl Acetic Acid | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Ametroctradin              | 6                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Azoxystrobin               | 2                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Buprofezin                 | 1<br>/0.0<br>1         |                                                        | 0.<br>0<br>3<br>3<br>7        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Carbendazim                | 3                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Chlormequat Chloride (CCC) | 0.05<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Copper Hydroxide           | \$                     | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Copper Sulphate            | \$                     | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Cuprous Oxide              | \$                     | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Cyantranilipole            | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Cyazofamid                 | 1                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Cymoxanil                  | 0.1                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Difenoconazole             | 3                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Dimethomorph               | 2                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Mancozeb                   | 5                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide          | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|--------------------|------------------------|--------------------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                    |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Metiram as CS2     | 5                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Diuron             | 1                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Famoxadone         | 2                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fenamidone         | 0.6                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fipronil           | 0.01<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Flusilazole        | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Forchlorfenuron    | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fosetyl-Al         | 10                     | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Hydrogen Cyanamide | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Imidacloprid       | 1                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Iprodione          | 10                     | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Lambda cyhalothrin | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Mandipropamid      | 2                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Metalaxyl-M        | 1                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Methomyl           | 0.3                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Myclobutanil       | 1                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Penconazole        | 0.4                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Picoxystrobin      | 0.05<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide                     | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |                        |                        |                        |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|-------------------------------|------------------------|--------------------------------------------------------|-------------------------------|------------------------|------------------------|------------------------|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                               |                        |                                                        |                               |                        |                        |                        |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Propineb                      | 0.5                    | BL<br>Q                                                |                               |                        |                        |                        |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Pyraclostrobin                | 2                      | BL<br>Q                                                |                               |                        |                        |                        |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Tebuconazole                  | 6<br>/0.0<br>1         |                                                        |                               | 0.<br>0<br>2<br>0<br>8 |                        |                        |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Thiophanate-Methyl            | 3                      | BL<br>Q                                                |                               |                        |                        |                        |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Triadimefon                   | 2                      | BL<br>Q                                                |                               |                        |                        |                        |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Trifloxystrobin               | 3                      | BL<br>Q                                                |                               |                        |                        |                        |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Tridemorph                    | 0.5                    | BL<br>Q                                                |                               |                        |                        |                        |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fluopicolide                  | 2                      | BL<br>Q                                                |                               |                        |                        |                        |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fluopyram and its metabolites | 2                      | BL<br>Q                                                |                               |                        |                        |                        |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Boscalid                      | 5                      | BL<br>Q                                                |                               |                        |                        |                        |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Metrafenone                   | 5                      | BL<br>Q                                                |                               |                        |                        |                        |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fluxapyroxad                  | 3                      | BL<br>Q                                                |                               |                        |                        |                        |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Abamectin                     | 0.05<br>*              | BL<br>Q                                                |                               |                        |                        |                        |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Hexaconazole                  | 0.1                    | BL<br>Q                                                |                               |                        |                        |                        |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Iprovalicarb                  | 0.01                   |                                                        |                               | 0.<br>0<br>5<br>3<br>9 | 0.<br>0<br>5<br>1<br>1 | 0.<br>0<br>1<br>2<br>7 |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity    | Pesticide      | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg<br>/kg) |                        |                   |                   |                   |                   |                   |  |  |  |  |  |  |
|-------------------|------------------|----------------|------------------------|--------------------------------------------------------|----------------------------------|------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|--|--|--|--|--|--|
|                   |                  |                |                        |                                                        |                                  |                        |                   |                   |                   |                   |                   |  |  |  |  |  |  |
|                   |                  | Myclobutanil   | 0.01                   |                                                        | 0.<br>0<br>4<br>3<br>6           | 0.<br>0<br>7<br>4<br>6 |                   |                   |                   |                   |                   |  |  |  |  |  |  |
|                   |                  |                |                        |                                                        |                                  |                        |                   |                   |                   |                   |                   |  |  |  |  |  |  |
|                   |                  |                |                        |                                                        |                                  |                        |                   |                   |                   |                   |                   |  |  |  |  |  |  |
| 1<br>6            | Pomeg<br>ranates | Difenoconazole | 0.8                    |                                                        | 0.<br>0<br>1<br>1                | 0.<br>0<br>4<br>9      |                   |                   |                   |                   |                   |  |  |  |  |  |  |
|                   |                  | Metiram as CS2 | 0.05<br>*              | BL<br>Q                                                |                                  |                        |                   |                   |                   |                   |                   |  |  |  |  |  |  |
|                   |                  | Ethephon       | 0.05                   | BL<br>Q                                                |                                  |                        |                   |                   |                   |                   |                   |  |  |  |  |  |  |
|                   |                  | Propineb       | 0.5                    | BL<br>Q                                                |                                  |                        |                   |                   |                   |                   |                   |  |  |  |  |  |  |
|                   |                  | Pyraclostrobin | 0.02<br>*              | BL<br>Q                                                |                                  |                        |                   |                   |                   |                   |                   |  |  |  |  |  |  |
|                   |                  | Carbendazim    | 0.01                   |                                                        | 0.<br>0<br>9<br>1                | 0.<br>0<br>1<br>1      | 0.<br>0<br>2<br>1 | 0.<br>1<br>4<br>1 | 0.<br>0<br>6<br>2 | 0.<br>0<br>3<br>4 | 0.<br>2<br>1<br>8 |  |  |  |  |  |  |
|                   |                  | Tebuconazole   | 0.01                   |                                                        | 0.<br>1<br>0<br>7                |                        |                   |                   |                   |                   |                   |  |  |  |  |  |  |
|                   |                  | Azoxystrobin   | 0.1                    |                                                        | 0.<br>1<br>6                     | 0.<br>1<br>8           | 0.<br>0<br>5      |                   |                   |                   |                   |  |  |  |  |  |  |
| Cyfluthrin        | 0.01             |                | 0.<br>7<br>1           | 0.<br>2<br>8                                           |                                  |                        |                   |                   |                   |                   |                   |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide          | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |                        |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|--------------------|------------------------|--------------------------------------------------------|-------------------------------|------------------------|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                    |                        |                                                        |                               |                        |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Benfluralin        | 0.01                   |                                                        | 0.<br>0<br>1<br>1             |                        |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fenpropanthrin     | 0.01                   |                                                        | 0.<br>0<br>1<br>5             |                        |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Lambda Cyhalothrin | 0.01                   |                                                        | 0.<br>0<br>1<br>2             | 0.<br>0<br>2           |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Hexaconazole       | 0.01                   |                                                        | 0.<br>0<br>1<br>4             | 0.<br>0<br>1<br>5      |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Deltamethrin       | 0.01                   |                                                        | 0.<br>1<br>2                  |                        |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Enamectin Benzoate | 0.01                   |                                                        | 0.<br>0<br>1<br>2<br>8        | 0.<br>0<br>1<br>2<br>2 |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Thiophanate methyl | 0.01                   |                                                        | 0.<br>4<br>2<br>9             | 0.<br>4<br>6<br>3      |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Imidacloprid       | 0.01                   |                                                        | 0.<br>0<br>1<br>4<br>9        |                        |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity    | Pesticide                                                     | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg<br>/kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|------------------|---------------------------------------------------------------|------------------------|--------------------------------------------------------|----------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |                  |                                                               |                        |                                                        |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1<br>7            | Custard<br>Apple |                                                               |                        |                                                        |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1<br>8            | Banana           | Sum of benomyl and<br>carbendazim expressed as<br>carbendazim | 1                      | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                  | Carbendazim                                                   | 1                      | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                  | Metiram as CS2                                                | 2                      | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                  | Diuron                                                        | 0.1                    | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                  | Pyraclostrobin                                                | 0.02<br>*              | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                  | Trifloxystobin                                                | 0.1                    | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                  | Tebuconazole                                                  | 1.5                    | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                  |                                                               |                        | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1<br>9            | Papaya           | Copper Sulphate                                               | \$                     | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                  | Thiophanate-Methyl                                            | 7                      | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                  |                                                               |                        | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2<br>0            | Sweetli<br>me    | Carbendazim                                                   | 0.01                   |                                                        | 0.<br>1<br>4<br>2                |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                  | Profenophos                                                   | 0.01                   |                                                        | 0.<br>0<br>2<br>6<br>6           |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                  |                                                               |                        |                                                        |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity      | Pesticide       | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |                   |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|--------------------|-----------------|------------------------|--------------------------------------------------------|-------------------------------|-------------------|--|--|--|--|--|--|--|--|--|--|--|
|                   |                    |                 |                        |                                                        |                               |                   |  |  |  |  |  |  |  |  |  |  |  |
| 2<br>1            | Orange<br>(Citrus) | Carbaryl        | 15                     | BL<br>Q                                                |                               |                   |  |  |  |  |  |  |  |  |  |  |  |
|                   |                    | Cuprous Oxide   | \$                     | BL<br>Q                                                |                               |                   |  |  |  |  |  |  |  |  |  |  |  |
|                   |                    | Cymoxanil       | 0.05<br>*              | BL<br>Q                                                |                               |                   |  |  |  |  |  |  |  |  |  |  |  |
|                   |                    | Diafenthiuron   | 0.2                    | BL<br>Q                                                |                               |                   |  |  |  |  |  |  |  |  |  |  |  |
|                   |                    | Mancozeb        | 0.05<br>*              | BL<br>Q                                                |                               |                   |  |  |  |  |  |  |  |  |  |  |  |
|                   |                    | Diuron          | 1                      | BL<br>Q                                                |                               |                   |  |  |  |  |  |  |  |  |  |  |  |
|                   |                    | Imidacloprid    | 1                      | BL<br>Q                                                |                               |                   |  |  |  |  |  |  |  |  |  |  |  |
|                   |                    | Copper Sulphate | \$                     | BL<br>Q                                                |                               |                   |  |  |  |  |  |  |  |  |  |  |  |
|                   |                    | Phosalone       | 1                      | BL<br>Q                                                |                               |                   |  |  |  |  |  |  |  |  |  |  |  |
|                   |                    | Quinalphos      | 0.05                   | BL<br>Q                                                |                               |                   |  |  |  |  |  |  |  |  |  |  |  |
|                   |                    | Monocrotophos   | 0.2                    | BL<br>Q                                                |                               |                   |  |  |  |  |  |  |  |  |  |  |  |
|                   |                    | Azoxystrobin    | 0.01                   |                                                        | 0.<br>2<br>6<br>5             |                   |  |  |  |  |  |  |  |  |  |  |  |
|                   |                    | Dimethomorph    | 0.01                   |                                                        | 0.<br>1<br>0<br>3             | 0.<br>1<br>6<br>3 |  |  |  |  |  |  |  |  |  |  |  |
|                   |                    | Carbendazim     | 0.01                   |                                                        | 0.<br>1<br>2<br>9             |                   |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide                  | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|----------------------------|------------------------|--------------------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                            |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |
| 2<br>2            | Sapota        | Benomyl                    | 0.01                   |                                                        | 0.                            |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               |                            |                        |                                                        | 0.                            |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Carbandezim                | 0.01                   |                                                        | 0.                            |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               |                            |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |
| 2<br>3            | Guava         | Copper Sulphate            | \$                     | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Chlorantraniliprole        | 0.01                   |                                                        | 0.                            |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               |                            |                        |                                                        | 0.                            |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Enamectin Benzoate         | 0.01                   |                                                        | 0.                            |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               |                            |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |
| 2<br>4            | Tomat<br>o    | Alpha naphthyl Acetic Acid | 0.1                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Ametroctradin              | 0.3                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Azoxystrobin               | 1                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Chlorantraniliprole        | 0.6                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Cyantranilipole            | 0.5                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Cyazofamid                 | 0.01<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Cymoxanil                  | 0.01<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Deltamethrin (Decamethrin) | 0.3                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide          | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|--------------------|------------------------|--------------------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                    |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Difenoconazole     | 0.2                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Dimethomorph       | 0.2                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Metiram as CS2     | 5                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Ethephon           | 2                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Famoxadone         | 2                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fenamidone         | 1.5                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fenazaquin         | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Flubendiamide      | 2                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Imidacloprid       | 1                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Indoxacarb         | 0.5                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Iprodione          | 5                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Kasugamycin        | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Lambda cyhalothrin | 0.1                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Mandipropamid      | 0.3                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Metalaxyl-M        | 0.5                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Methomyl           | 1                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Metribuzin         | 0.05<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Novaluron          | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide                       | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|---------------------------------|------------------------|--------------------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                                 |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Propineb                        | 1                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Pyraclostrobin                  | 0.3                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Spiromesifen                    | 0.7                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Tebuconazole                    | 2                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Thiamethoxam                    | 0.7                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Trifloxystrobin                 | 1                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Sodium Para Nitro Phenolate     | 0.3                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Emamectin Benzoate              | 0.01                   | 0.<br>5<br>3<br>3                                      |                               |  |  |  |  |  |  |  |  |  |  |  |  |
| 2<br>5            | Potato        | 2,4-Dichlorophenoxy Acetic Acid | 0.2                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Ametroctradin                   | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Azoxystrobin                    | 7                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Carbaryl                        | 0.2                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Carbendazim                     | 0.01<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Chlormequat Chloride (CCC)      | 0.1                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Chlorothalonil                  | 0.1                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Chlorpropham                    | 30                     | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide          | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|--------------------|------------------------|--------------------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                    |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Chlorpyriphos      | 2                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Copper Hydroxide   | \$                     | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Copper Oxychloride | \$                     | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Cuprous Oxide      | \$                     | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Cyazofamid         | 0.02<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Cymoxanil          | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Dimethomorph       | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Dithiocarbamates   | 0.2                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Metiram as CS2     | 0.2                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Famoxadone         | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fenamidone         | 0.02                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Hexaconazole       | 0.02                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Kresoxim Methyl    | 0.02<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Mandipropamid      | 0.05<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Mepiquat Chloride  | 0.1                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Metalaxyl-M        | 0.05<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Metribuzin         | 0.05<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Oxyfluorfen        | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide           | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|---------------------|------------------------|--------------------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                     |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Paraquat dichloride | 0.2                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Phosalone           | 0.1                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Propineb            | 0.5                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Pyraclostrobin      | 0.05<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Thiamethoxam        | 0.3                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Thiometon           | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               |                     |                        | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
| 2<br>6            | Onion         | Azoxystrobin        | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Mancozeb            | 4                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Metiram as CS2      | 0.05<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fenoxaprop-p-ethyl  | 0.05<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fipronil            | 0.04                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Lambda cyhalothrin  | 0.01                   |                                                        | 0.<br>4<br>2                  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Oxadiazyl           | 0.1                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Pendimethalin       | 0.4                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Propaquizafop       | 0.01<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Pryraclostrobin     | 1.5                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide                  | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg<br>/kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|----------------------------|------------------------|--------------------------------------------------------|----------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                            |                        |                                                        |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Quizalofop ethyl           | 0.01<br>*              | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Tebuconazole               | 0.15                   | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Chlorpyriphos              | 0.01                   | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Oxyfluorfen                | 0.05                   | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Tau fluvalinate            | 0.01                   |                                                        | 0.<br>0<br>2                     |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               |                            |                        |                                                        |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2<br>7            | Chilli        | Acetamiprid                | 2                      | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Alpha naphthyl Acetic Acid | 0.2                    | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Azoxystrobin               | 1                      | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Buprofezin                 | 2                      | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Carbaryl                   | 5                      | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Carbosulfan                | 2                      | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Chlorantraniliprole        | 0.6                    | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Chlorfenapyr               | 0.05                   | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Cuprous Oxide              | §                      | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Cyantranilipole            | 0.5                    | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Deltamethrin (Decamethrin) | 0.05                   | BL<br>Q                                                |                                  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide                            | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|--------------------------------------|------------------------|--------------------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                                      |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Diafenthiuron                        | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Dicofol (sum of o,p' & p,p' isomers) | 1                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Difenoconazole                       | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Dimethoate                           | 0.5                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Dithiocarbamates                     | 1                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Mancozeb                             | 1                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Metiram as CS2                       | 1                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fenazaquin                           | 0.5                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fenpropathrin                        | 0.2                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fenpyroximate                        | 1                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fipronil                             | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Flubendiamide                        | 0.02                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Flusilazole                          | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Hexaconazole                         | 0.5                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Hexythiazox                          | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Imidachloprid                        | 0.3                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Indoxacarb                           | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Kresoxim Methyl                      | 0.15                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide          | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|--------------------|------------------------|--------------------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                    |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Lambda cyhalothrin | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Lufenuron          | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Metalaxy-M         | 0.02                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Methomyl           | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Milbemectin        | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Monocrotophos      | 0.2                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Myclobutanil       | 0.2                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Novaluron          | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Oxydemeton-Methyl  | 2                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Pendimethalin      | 0.05<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Picoxystrobin      | 0.05<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Propargite         | 2                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Propineb           | 2                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Pyraclostrobin     | 0.05<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Pyridalyl          | 0.02                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Pyriproxyfen       | 0.02                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Quinalphos         | 0.2                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Spinosad           | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o          | Comm<br>odity | Pesticide                      | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |         |  |  |  |  |  |  |  |  |  |  |  |  |
|----------------------------|---------------|--------------------------------|------------------------|--------------------------------------------------------|-------------------------------|---------|--|--|--|--|--|--|--|--|--|--|--|--|
|                            |               |                                |                        |                                                        |                               |         |  |  |  |  |  |  |  |  |  |  |  |  |
|                            |               | Spiromesifen                   | 0.1                    | BL<br>Q                                                |                               |         |  |  |  |  |  |  |  |  |  |  |  |  |
|                            |               | Thiacloprid                    | 0.02                   | BL<br>Q                                                |                               |         |  |  |  |  |  |  |  |  |  |  |  |  |
|                            |               | Thiodicarb                     | 0.01                   | BL<br>Q                                                |                               |         |  |  |  |  |  |  |  |  |  |  |  |  |
|                            |               | Thiamethoxam                   | 0.5                    | BL<br>Q                                                |                               |         |  |  |  |  |  |  |  |  |  |  |  |  |
|                            |               | Triadimefon                    | 0.4                    | BL<br>Q                                                |                               |         |  |  |  |  |  |  |  |  |  |  |  |  |
|                            |               | Trifloxystrobin                | 0.4                    | BL<br>Q                                                |                               |         |  |  |  |  |  |  |  |  |  |  |  |  |
|                            |               | Triazophos                     | 0.2                    | BL<br>Q                                                |                               |         |  |  |  |  |  |  |  |  |  |  |  |  |
|                            |               | Tricyclazole                   | 0.3                    | BL<br>Q                                                |                               |         |  |  |  |  |  |  |  |  |  |  |  |  |
|                            |               | Spinetoram and its metabolites | 0.05                   | BL<br>Q                                                |                               |         |  |  |  |  |  |  |  |  |  |  |  |  |
|                            |               | Spirotetramat                  | 2                      | BL<br>Q                                                |                               |         |  |  |  |  |  |  |  |  |  |  |  |  |
|                            |               | Abamectin                      | 0.05<br>*              | BL<br>Q                                                |                               |         |  |  |  |  |  |  |  |  |  |  |  |  |
|                            |               | 2<br>8                         | Brinjal                | Beta Cyfluthrin                                        | 0.2                           | BL<br>Q |  |  |  |  |  |  |  |  |  |  |  |  |
| Chlorantraniliprole        | 0.6/<br>0.01  |                                |                        |                                                        | 0.<br>0<br>2<br>3<br>5        |         |  |  |  |  |  |  |  |  |  |  |  |  |
| Chlormequat Chloride (CCC) | 0.1           |                                |                        | BL<br>Q                                                |                               |         |  |  |  |  |  |  |  |  |  |  |  |  |
| Cyantranilipole            | 0.06          |                                |                        | BL<br>Q                                                |                               |         |  |  |  |  |  |  |  |  |  |  |  |  |
| Cypermethrin               | 0.2           |                                |                        | BL<br>Q                                                |                               |         |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide                         | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|-----------------------------------|------------------------|--------------------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                                   |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Deltamethrin (Decamethrin)        | 0.3                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Diafenthiuron                     | 1                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Etoazole                          | 0.2                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fenazaquin                        | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fenpropathrin                     | 0.2                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fenvalerate (Fat soluble residue) | 2                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Flubendiamide                     | 0.1                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Imidacloprid                      | 0.2                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Lambda cyhalothrin                | 0.2                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Propargite                        | 2                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Pyriproxyfen                      | 0.02                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Spiromesifen                      | 0.5                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Thiacloprid                       | 0.7                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Thiodicarb                        | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Thiamethoxam                      | 0.3                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Spirotetramat                     | 1                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Enamectin Benzoate                | 0.01                   | 0.<br>0<br>1                                           |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide                         | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |   |   |   |   |   |   |   |   |    |  |  |  |  |  |  |  |
|-------------------|---------------|-----------------------------------|------------------------|--------------------------------------------------------|-------------------------------|---|---|---|---|---|---|---|---|----|--|--|--|--|--|--|--|
|                   |               |                                   |                        |                                                        | 1                             | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |  |  |  |  |  |  |  |
|                   |               |                                   |                        |                                                        | 1                             |   |   |   |   |   |   |   |   |    |  |  |  |  |  |  |  |
|                   |               |                                   |                        |                                                        | 9                             |   |   |   |   |   |   |   |   |    |  |  |  |  |  |  |  |
| 2<br>9            | Okra          | Acetamiprid                       | 0.1                    | BL<br>Q                                                |                               |   |   |   |   |   |   |   |   |    |  |  |  |  |  |  |  |
|                   |               | Beta Cyfluthrin                   | 0.01<br>*              | BL<br>Q                                                |                               |   |   |   |   |   |   |   |   |    |  |  |  |  |  |  |  |
|                   |               | Buprofezin                        | 0.01<br>*              | BL<br>Q                                                |                               |   |   |   |   |   |   |   |   |    |  |  |  |  |  |  |  |
|                   |               | Carbaryl                          | 10                     | BL<br>Q                                                |                               |   |   |   |   |   |   |   |   |    |  |  |  |  |  |  |  |
|                   |               | Chlorantraniliprole               | 0.3                    | BL<br>Q                                                |                               |   |   |   |   |   |   |   |   |    |  |  |  |  |  |  |  |
|                   |               | Cyantranilipole                   | 0.5                    | BL<br>Q                                                |                               |   |   |   |   |   |   |   |   |    |  |  |  |  |  |  |  |
|                   |               | Cypermethrin                      | 0.5                    | BL<br>Q                                                |                               |   |   |   |   |   |   |   |   |    |  |  |  |  |  |  |  |
|                   |               | Deltamethrin (Decamethrin)        | 0.05                   | BL<br>Q                                                |                               |   |   |   |   |   |   |   |   |    |  |  |  |  |  |  |  |
|                   |               | Emamectin Benzoate                | 0.05                   | BL<br>Q                                                |                               |   |   |   |   |   |   |   |   |    |  |  |  |  |  |  |  |
|                   |               | Fenazaquin                        | 0.01                   | BL<br>Q                                                |                               |   |   |   |   |   |   |   |   |    |  |  |  |  |  |  |  |
|                   |               | Fenpropathrin                     | 0.5                    | BL<br>Q                                                |                               |   |   |   |   |   |   |   |   |    |  |  |  |  |  |  |  |
|                   |               | Fenvalerate (Fat soluble residue) | 2                      | BL<br>Q                                                |                               |   |   |   |   |   |   |   |   |    |  |  |  |  |  |  |  |
|                   |               | Imidacloprid                      | 2                      | BL<br>Q                                                |                               |   |   |   |   |   |   |   |   |    |  |  |  |  |  |  |  |
|                   |               | Lambda cyhalothrin                | 2                      | BL<br>Q                                                |                               |   |   |   |   |   |   |   |   |    |  |  |  |  |  |  |  |
|                   |               | Pyridalyl                         | 0.02                   | BL<br>Q                                                |                               |   |   |   |   |   |   |   |   |    |  |  |  |  |  |  |  |
| Pyriproxyfen      | 0.03          | BL<br>Q                           |                        |                                                        |                               |   |   |   |   |   |   |   |   |    |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide                                                                             | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|---------------------------------------------------------------------------------------|------------------------|--------------------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                                                                                       |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Spiromesifen                                                                          | 0.03                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Thiamethoxam                                                                          | 0.5                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Tolfenpyrad                                                                           | 0.7                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Spirotetramat                                                                         | 1                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Flupyradifurone and its metabolites Difluroacetic Acid and Difluroethylamino-furanone | 0.8                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Chlorofevinphos                                                                       | 0.01                   |                                                        | 0.<br>0<br>5                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Tau fluvalinate                                                                       | 0.01                   |                                                        | 0.<br>0<br>2                  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Profenophos                                                                           | 0.01                   |                                                        | 0.<br>0<br>1<br>1             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3<br>0            | Beans         |                                                                                       |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3<br>1            | Cucum<br>ber  | Ametroctradin                                                                         | 0.4                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Azoxystrobin                                                                          | 0.05<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Cymoxanil                                                                             | 0.1                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Mancozeb                                                                              | 0.4                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Metiram as CS2                                                                        | 2                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity                  | Pesticide           | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg<br>/kg) |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|--------------------------------|---------------------|------------------------|--------------------------------------------------------|----------------------------------|------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |                                |                     |                        |                                                        |                                  |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Ethion              | 0.5                    | BL<br>Q                                                |                                  |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Imidacloprid        | 1                      | BL<br>Q                                                |                                  |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Permethrin          | 0.5                    | BL<br>Q                                                |                                  |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Pyraclostrobin      | 0.2                    | BL<br>Q                                                |                                  |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Thiophanate-Methyl  | 0.2                    | BL<br>Q                                                |                                  |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Carbendazim         | 0.01                   | BL<br>Q                                                | 0.<br>0<br>3<br>9<br>4           | 0.<br>0<br>1<br>4<br>9 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3<br>2            | Turmer<br>ic                   | Zineb as CS2        | 2                      | BL<br>Q                                                |                                  |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3<br>3            | Gourd                          | Chlorantraniliprole | 0.03                   | BL<br>Q                                                |                                  |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Halosulfuron methyl | 0.01<br>*              | BL<br>Q                                                |                                  |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Thiophanate-Methyl  | 0.4                    | BL<br>Q                                                |                                  |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3<br>4            | Meat &<br>Meat<br>Produc<br>ts | Acephate            | 0.05                   | BL<br>Q                                                |                                  |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Acetamiprid         | 0.05                   | BL<br>Q                                                |                                  |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Bitertanol          | 0.05                   | BL<br>Q                                                |                                  |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Chlorantraniliprole | 0.2                    | BL<br>Q                                                |                                  |                        |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide                  | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|----------------------------|------------------------|--------------------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                            |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Chlorothalonil             | 0.02                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Chlothianidin              | 0.02                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Deltamethrin (Decamethrin) | 0.5                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Difenaconazole             | 0.2                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Dimethoate                 | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Mancozeb                   | 0.1                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Ethofenprox (Etofenprox)   | 0.5                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fenpropathrin              | 0.02                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fipronil                   | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fluzilazole                | 1                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Glyphosate                 | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Imidacloprid               | 0.1                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Indoxacarb                 | 2                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Kresoxim Methyl            | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Methomyl                   | 0.02                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Oxydemeton-Methyl          | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Penconazole                | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Profenofos                 | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity                  | Pesticide                                             | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|--------------------------------|-------------------------------------------------------|------------------------|--------------------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |                                |                                                       |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Propiconazole                                         | 0.01                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Spinosad                                              | 2                      | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Tebuconazole                                          | 0.05                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Thiacloprid                                           | 0.1                    | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Thiodicarb                                            | 0.02                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Thiamethoxam                                          | 0.02                   | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Triadimefon                                           | 0.02<br>*              | BL<br>Q                                                |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                |                                                       |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3<br>5            | Milk &<br>Milk<br>Produc<br>ts | 2,4-Dichlorophenoxy Acetic Acid                       | 0.05                   |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Acephate                                              | 0.02                   |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Acetamiprid                                           | 0.02                   |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Azoxystrobin                                          | 0.01                   |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Sum of benomyl & carbendazim expressed as carbendazim | 0.1(F)                 |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Bifenthrin                                            | 0.2                    |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Bitertanol                                            | 0.05                   |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Buprofezin                                            | 0.01                   |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Carbaryl                                              | 0.05                   |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Carbendazim                                           | 0.1(F)                 |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Carbofuran                                            | 0.05 (fat basis)       |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Chlorantraniliprole                                   | 0.05                   |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |                                | Chlorothalonil                                        | 0.07                   |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

| S<br>r.<br>N<br>o | Comm<br>odity | Pesticide                         | MR<br>L<br>(mg<br>/kg) | Ac<br>tu<br>al<br>va<br>lu<br>es<br>(B<br>M<br>RL<br>) | Actual Values (AMRL) (mg /kg) |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-------------------|---------------|-----------------------------------|------------------------|--------------------------------------------------------|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
|                   |               |                                   |                        |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Chlorpyriphos                     | 0.02                   |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Chlothianidin                     | 0.02                   |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Cypermethrin                      | 0.05                   |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Deltamethrin (Decamethrin)        | 0.05                   |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Dichlorvos (DDVP)                 | 0.01                   |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Difenoconazole                    | 0.02                   |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Dimethoate                        | 0.05                   |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Dinotefuran                       | 0.1                    |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Mancozeb                          | 0.05                   |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Metiram as CS2                    | 0.05                   |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Edifenphos                        | 0.01 (F)               |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Emamectin Benzoate                | 0.01 *                 |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Ethion                            | 0.5 (F)                |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Ethofenprox (Etofenprox)          | 0.02                   |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fenpropathrin                     | 0.1                    |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fenvalerate (Fat soluble residue) | 0.01 (F)               |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Fipronil                          | 0.02                   |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Flubendiamide                     | 0.1                    |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Flusilazole                       | 0.05                   |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Glufosinate Ammonium              | 0.02                   |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Imidacloprid                      | 0.1                    |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Indoxacarb                        | 0.1                    |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Kresoxim Methyl                   | 0.01                   |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Methomyl                          | 0.02                   |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Methyl Chlorophenoxy Acetic Acid  | 0.04                   |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|                   |               | Metolachlor                       | 0.01 *                 |                                                        |                               |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |



