Full Project Proposal

Productive Partnership Project between LeanCrop Technology Solutions Pvt. Ltd. and Surya Farmer Producer Company Ltd., Omkarnath Shetkari Gat, Pragati CMRC, Vasmat CMRC & Roshani CMRC

Submitted to:
State of Maharashtra Agribusiness and Rural Transformation (SMART)

Submitted by:
Jointly by LeanCrop Technology Solutions Pvt. Ltd. (LeanAgri) and Surya FPCL, Omkarnath Shetkari Gat, Pragati CMRC, Vasmat CMRC & Roshani CMRC

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Chapter 1: Introduction and Background

Maharashtra is the 3rd largest state of India in terms of total area and largest contributor to the country's GDP. The state's economy is primarily agricultural and it is a major occupation of large number of people in Maharashtra. The state is one of the largest in terms of the number of agriculture based CBOs (Community Based Organisations), who have evolved and grown in the last few years in terms of production and trade. However, the growth of those CBOs and farmers is at sub-optimum level due to the lack of required resources such as technology to improve their yield and product quality & infrastructure (pre and post-harvest) to increase their product marketability. The state of Maharashtra has envisaged the SMART project with an overall mission to increase farmer's income, increase women employment, and overall contribution to the state's GDP. It intends to achieve this by enhancing the enterprise formation, increasing access to markets; and promoting climate resilience and resource-use efficiency.

Under this project, the state government aims to bring together producers groups and buyers to jointly work on the developing the value chain through a "Productive Partnership Project".

This current partnership proposal, which is envisaged by LeanCrop Technology Solutions Pvt. Ltd., is targeting the small and marginal farmers **especially women farmers aimed at increasing their farm incomes with the help of end-to-end consultancy in agronomy and marketing backed with technology**. The commodity value chain selected is Turmeric. LeanAgri will do their analysis based on 30+ data parameters via soil, cultivable land area, water, climate and historic crop data to develop season-long calendar of farm activities in regards to nutrient management and pest-disease management and direct procurement from CBO. LeanAgri will also assist in arranging the high value seeds of improved varieties of turmeric seed from IISR (Indian Institute of Spice Research, Kozhikode)

The below mentioned tables summarises the project background:

S.No.	Criteria	Our Submission
a)	Name of the Sub-Project	Partnership proposal for high value curcumin content production
b)	Name of Value Chain Partners	**Buyer** • LeanCrop Technology Solutions Pvt. Ltd. (LeanAgri) **CBOs** • Surya Farmer Producer Company Ltd., Basmat Hingoli • Omkarnath Shetkari Gat, Basmat Hingoli • Pragati CMRC Satara • Vasmat CMRC • Roshani CMRC, Javlabajar

c)	Contact Details of Key Value Chain Partners	**Buyer** • Name: LeanCrop Technology Solutions Pvt. Ltd. • Address: A – 501, Teerth Technospace, Mumbai Bangalore Highway, Behind Mercedes Benz Show Room, Baner, Pune – 411045 • Name of Key Personnel/ (s): Sai Gole/ Siddharth Dialani • Designation of Key Personnel/ (s): Director • Contact details of Key Personnel/ (s): 9884316188/ 9884308764 **CBOs** • Name: Surya FPCL, Basmat Hingoli • Name of Key Personnel/ (s): Pralhad Borgad • Designation of Key Personnel/ (s): Director • Contact details of Key Personnel/ (s): 9850385727 (surya.fpc@gmail.com) • Name: Omkarnath Shetkari Gat, Basmat Hingoli • Name of Key Personnel/ (s): Vijay Katore • Designation of Key Personnel/ (s): Promoter • Contact details of Key Personnel/ (s): 8329502817 • Name: Pragati CMRC Satara • Name of Key Personnel/ (s): Manisha Sachin Shelar • Designation of Key Personnel/ (s): Promoter • Contact details of Key Personnel/ (s):9139235565 pregaticmrcsatara@gmail.com • Name: Vasmat CMRC • Name of Key Personnel/ (s): Phulabai Jondhle • Designation of Key Personnel/ (s): Promoter • Contact details of Key Personnel/ (s): 9545845137 Vasmat.cmrc@gmail.com • Name: Roshani CMRC, Javlabajar, Hingoli • Name of Key Personnel/ (s):Nandabai Paikrao • Designation of Key Personnel/ (s): Promoter • Contact details of Key Personnel/ (s):. 7620003218 cmrc2011javalabazar@gmail.com
d)	Crop/ (s)	• Turmeric
e)	Variety	• Existing Variety- ○ Salem & Rajapuri ○ Curcumin Content 2.5-3.5% • Proposed Variety ○ Pratibha ○ Curcumin Content >5%
f)	Catchment/ Locations and Area in Ha	Hingoli District • Taluka – Basmat • Taluka – Hingoli Satara District • Taluka – Satara
g)	Sub-Project Objective	The sub-project objective is • To increase the existing yield of turmeric • To introduce new variety of turmeric with higher curcumin content

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<tr><td></td><td></td><td>

To increase the overall farmer’s income by reducing their overall cost of production by leasing out custom hiring equipment at a lower rate than the existing market.
To reduce the cost of production of turmeric

</td></tr>
<tr><td>h)</td><td>Value propositions</td><td>LeanAgri aims to assist the farmers and CBOs in the following key areas:

Access to quality seeds/ inputs
Improvement in total farm yield
Reduction in production and harvest cost
Marketable output
Buyback support

</td></tr>
<tr><td>i)</td><td>Procurement Targets (Total Quantity Procured from 5 CBO)</td><td>
<table>
<tr><th>Year</th><th>Quantity</th></tr>
<tr><td>2019-20</td><td>1000 MT</td></tr>
<tr><td>2020-21</td><td>2500 MT</td></tr>
<tr><td>2021-22</td><td>4500 MT</td></tr>
<tr><td>2022-23</td><td>5879 MT</td></tr>
<tr><td>2023-24</td><td>7252 MT</td></tr>
</table>
</td></tr>
<tr><td>j)</td><td>Farmers Benefitted</td><td>
<table>
<tr><th>Year</th><th>Number of Farmers</th></tr>
<tr><td>2019-20</td><td>800</td></tr>
<tr><td>2020-21</td><td>1600</td></tr>
<tr><td>2021-22</td><td>2300</td></tr>
<tr><td>2022-23</td><td>3000</td></tr>
<tr><td>2023-24</td><td>3700</td></tr>
</table>
</td></tr>
<tr><td>k)</td><td>Project Period</td><td>2019-2024 – Five Years</td></tr>
<tr><td>l)</td><td>Total Project Cost (INR Cr.)</td><td>
<table>
<tr><th>Item</th><th>Amount (In Rs. Lakh)</th></tr>
<tr><td>Land Development</td><td></td></tr>
<tr><td>Capacity Building of CBO</td><td>36</td></tr>
<tr><td>Quality Production</td><td>386.6</td></tr>
<tr><td>Post-harvest intervention</td><td>122.5</td></tr>
<tr><td>Plant & Machinery</td><td>-</td></tr>
<tr><td>Contingencies / pre-operative expenses</td><td>2.45</td></tr>
<tr><td>Total Project Cost</td><td>547.55</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Manpower and operating Exp. to be funded to MAVIM- PIU</td><td>32.58</td></tr>
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</td></tr>
<tr><td></td><td>Means of Finance</td><td>
<table>
<tr><th>Source</th><th>Amount (In Rs. Lakh)</th></tr>
<tr><td>Subsidy form SMART</td><td>342.93</td></tr>
<tr><td>Buyer Contribution</td><td>82.80</td></tr>
<tr><td>CBO Contribution</td><td>97.32</td></tr>
<tr><td>Bank Term Loan</td><td>24.50</td></tr>
<tr><td>Total Means of Finance</td><td>547.55</td></tr>
</table>
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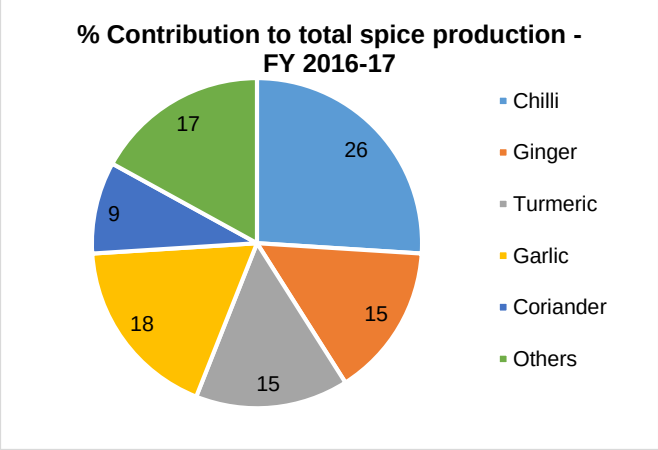
Chapter 2: Introduction of Crop

2.1 Turmeric Crop Profile

2.1.1 Introduction

India, known as the home of spices, boasts a long history of trading with the ancient civilisations of Rome and China. Today, Indian spices are the most sought-after globally, given their exquisite aroma, texture, taste and medicinal value. India has the largest domestic market for spices in the world. Traditionally, spices in India have been grown in small land holdings, with organic farming gaining prominence in recent times. India is the world's largest producer, consumer and exporter of spices; the country produces about 75 of the 109 varieties listed by the International Organization for Standardization (ISO) and accounts for half of the global trading in spices.

India is world's largest spice producer, with a 44 per cent share in output and 36 per cent in the global spices trade. In FY 2016 -17, India had produced 7.08 million MT of spices. Chilli was the highest contributor with 26% of the total spice production followed by Garlic with 17%, Ginger and Turmeric both with 15% of the total spice production.



Source – Spice Board

Andhra Pradesh, Rajasthan, Gujarat, Madhya Pradesh, Telangana are the leading spice producing states. Maharashtra ranks 11th with the production of 227 thousand MT of spices.

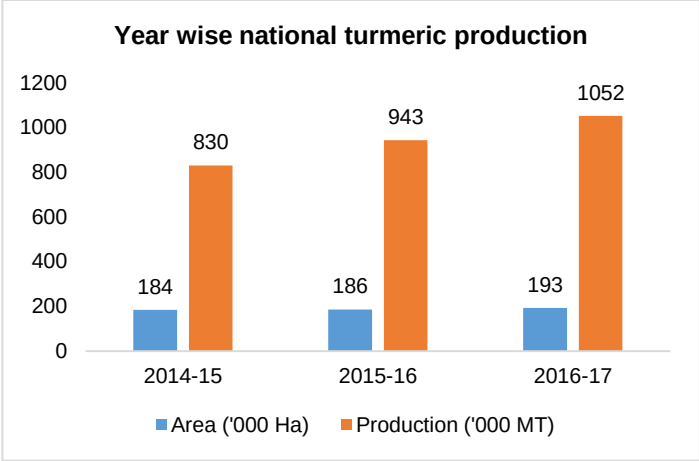
2.1.2 Export Scenario- Spices

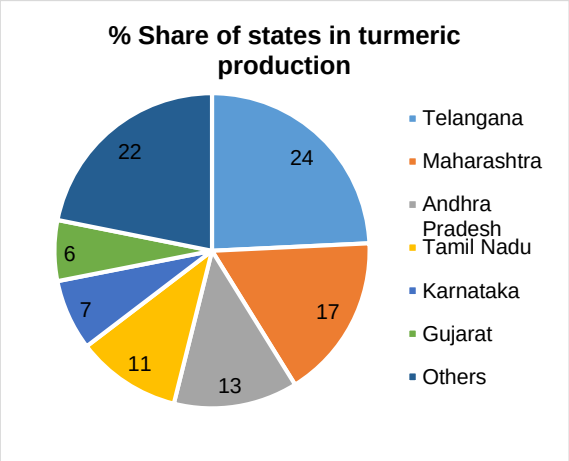
On the basis of high demand in international markets, Indian spices and spice products export have gained a new record in volume and value. During 2016-17, a total of 9, 47,790 tonnes valued Rs.17664.61 crore ($ 2633.30 million) has been exported from the country against the previous year. It registered an increase of 12 per cent in volume, nine percent in rupee terms and six percent in dollar terms from a year ago. In 2015-16 export came to 8, 43,255 tonnes valued at Rs.16238.23 crore ($ 2482.83 million). Chilli continued to be the most demanded spice in 2016-17 with the export of 4,00,250 tonnes amounting to Rs 5,070.75 crores, registering an increase of 15 percent in volume and 27 percent in value. Cumin was the second-most exported spice, recording an increase of 22 per cent in volume and 28 percent in value. A total volume of 1,19,000 tonnes of cumin valued at Rs.1963.20 crore was exported from India in 2016-17. Increased global demand for turmeric, especially in the pharmaceutical sector, drove its exports to attain figures of 1,16,500 tonnes in volume and crossed Rs 1,241 crores in value terms in 2016-17. The spice which showed the maximum increase as compared to the previous financial year was fennel, registering a 129 per cent increase in volume and 79 per cent in value. Export of garlic, nutmeg and mace and celery also increased. The key export destinations include USA, China, Vietnam, UAE and Indonesia.

2.1.3 Commodity profiling of Turmeric

Turmeric is an important commercial crop of India and is also famous "Indian saffron" because of its yellow colour. It is also used for religious purposes and is applied as an antiseptic for skin abrasions and cuts. It is mostly processed in the form of fine, dried, yellow powder and is marketed to both domestic and international markets. Turmeric is mainly used as spice for flavour, colour for yellow dye, cosmetic and drug. Turmeric has been used since ancient period for medical purposes as it has several medicinal properties such as stomach, ailments, blood purifier, as tonic, vermicide and antiseptic due to its curcumin contents, which have a wide range of healing effects and also protects the liver from a number of toxic compounds.

Turmeric also contains strong antioxidant and anti-inflammatory substance. Therefore, turmeric is classified as part of Indian's culture as an important ingredient in curry dishes; used in many religious observances, as a cosmetic, a dye, and for many traditional remedies. Turmeric production is distributed across the Asian region and Nigeria in Africa. Among the Asian countries, turmeric is widely cultivated in India, China, Myanmar and Bangladesh. India is the largest producer, consumer and exporter of Turmeric. Major area is in India which constitutes 82% followed by China (8%), Myanmar (4%), Nigeria (3%) and Bangladesh (3%). Global production of turmeric is estimated around 6 to 7 lakh tons. The main turmeric producing states in India are Telangana, Tamil Nadu, Andhra Pradesh, Maharashtra, Karnataka, and Gujarat. Telangana is largest producer of turmeric with production of 255 thousand tonnes followed by Maharashtra (178 thousand tonnes) and Andhra Pradesh (134 thousand tonnes).

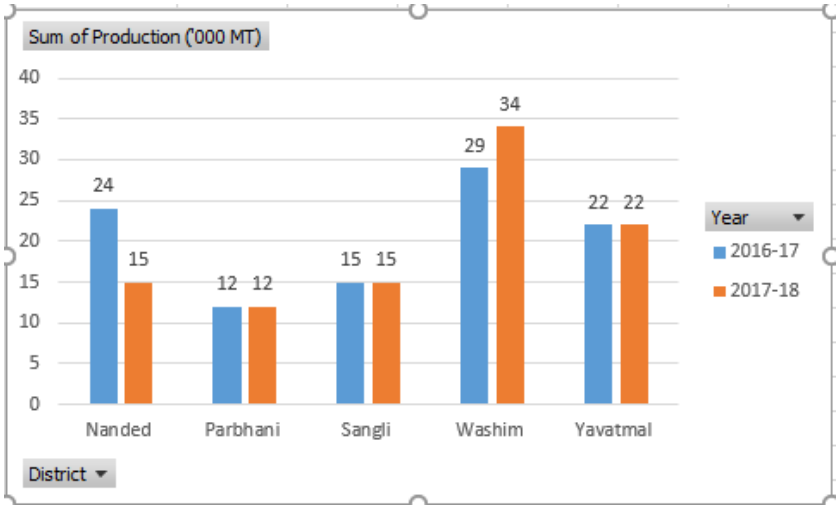




Source – NHB

Maharashtra ranks 2nd in turmeric production in India with a production of 178,000 tonnes. Washim, Yavatmal, Nanded, Sangli and Parbhani are the major turmeric growing districts in Maharashtra. Washim is largest producer of turmeric in Maharashtra with 29,000 MT production followed by Yavatmal with production of 22,000 MT.

Maharashtra turmeric productivity has improved significantly from 2.38 MT/ Ha in 2014-15 to 16.63 MT/Ha in 2016-17 and ranks 1st in turmeric productivity followed by Gujarat (15.98 MT/Ha) and Haryana (14.67 MT/Ha).



Source – NHB

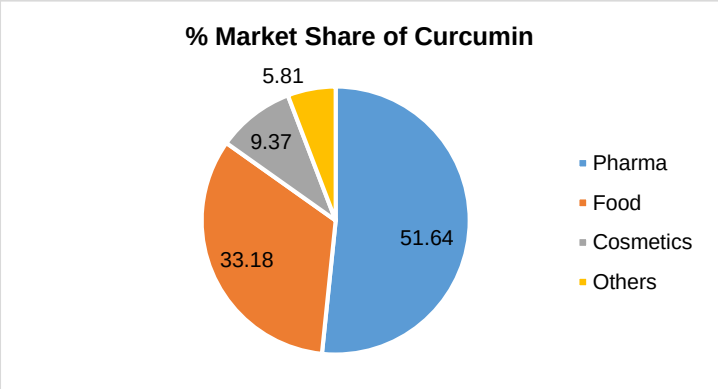
There are about 30 turmeric varieties grown in India. Among them Alleppey and Madras Perianadan are of great commercial importance. “Phule Swarupa, Rajapore and Sangli are the major commercial varieties are cultivated in Mahrashtra with regard to pre-harvest management. Land is prepared with the receipt of early monsoon showers. The soil is brought to a fine tilth by giving about four deep ploughings. Hydrated lime @ 500 kg/ha has to be applied for laterite soils and thoroughly ploughed. Immediately with the receipt of pre-monsoon showers, beds of 1.0 m width, 15 cm height and of convenient length are prepared with spacing of 50 cm between beds. Planting is also done by forming ridges and furrows. Turmeric is 8-9 months’ crop and is sown in the month of June-July in Maharashtra, preferably after the receipt of monsoon.

2.1.4 Curcumin

Curcumin is mainly obtained from the rhizomes of turmeric. It is an active ingredient of turmeric extracted from the Curcuma longa plant. Turmeric is a widely used ingredient in food and medical products on account of its therapeutic qualities, particularly in the Asian subcontinent. Demand for ayurvedic medicinal formulations has been gaining momentum in a number of developed countries as well, and this trend is anticipated to significantly benefit the market over the forecast period. The global curcumin market size was estimated at USD 44,246.3 thousand in 2016 and is projected to register a CAGR of 13.3% over the forecast period. Demand is projected to be driven by increasing use in cosmetic, food, and pharmaceutical industries. It exhibits advantageous anti-inflammatory and anti-oxidation properties, emerging as a go-to pain relief option for patients with arthritis and osteoarthritis.

The global curcumin market can be categorising into four major segments by the application. They are:

1. Pharmaceuticals
2. Foods
3. Cosmetics
4. Others



Source – NHB

Increasing awareness among consumers, especially in developed economies such as U.S., Denmark, and Germany, is further fuelling demand for curcumin over the forecast period. Growing demand for curcumin-based herbal and ayurvedic skin care products is projected to fuel the market over the coming years. In

addition, its use in nutritional supplements is an ongoing trend, which is supported by increasing consumer awareness regarding its anti-cancer properties.

2.1.5 Curcumin Market

North America was the largest regional market in 2016 and is anticipated to witness substantial growth on account of rising demand for curcumin-based nutritional supplements. Growing demand for applications in cosmetic preparations is expected fuel the market. Europe was the second largest market and is expected to witness the fastest growth rate over the forecast period. This can be attributed to increasing demand for curcumin in pharmaceutical and food applications. Research studies have hinted at application of curcumin for treatment of cancer and this is expected to be a major factor driving the market in Europe. Demand in Asia Pacific is expected to be driven by growing demand from several cosmetics and skin care manufactures. These herbal products are fast gaining prominence and penetration in a number of European and North American countries.

Manufacturers are largely concentrated in Asia Pacific on account of proximity to raw material suppliers and relatively high content of curcumin in Indian turmeric varieties. Curcumin content in Indian turmeric varieties ranges from 3%-9%; these include Rajendra Sonia, Suguna, IISR Prabha, Suroma, and Roma. Supply of raw material depends of seasonal and climatic fluctuations as well as yield of local turmeric variety.

Some of the major players in the market are Biomax Life Sciences Ltd., Synthite Industries Ltd., Hindustan Mint & Agro Products Pvt. Ltd., Konark Herbals & Health Care, Arjuna Natural Extracts Ltd., SV Agrofood, Star Hi Herbs Pvt. Ltd., Helmigs Prima Sejahtera PT., Hebei Food Additive Co. Ltd., Tri Rahardja PT, and Herboveda India Pvt. Ltd. Some of the popular Indian brands of herbal cosmetics and skin care products employing curcumin are Vicco, Shahnaz Husain, and Himalaya Herbals.

2.1.6 Pratibha turmeric variety

Pratibha variety of turmeric is released by ICAR IISR (Indian Institute of Spice Research, Kozhikode) in 1996. It is all India tested and released variety. Some of the main advantages of Pratibha are higher curcumin content (6.5%, average) and its resistance to root-knot nematode diseases. The turmeric has characteristic Orange-yellow color which signifies higher curcumin content.

This turmeric has higher export value due to the demand of curcumin in pharmaceutical industry.

Chapter 3: Introduction of Catchment

3.1. District Profile: Hingoli

Hingoli is located in the Marathwada region of Maharashtra and on the Marathwada-Vidharbha border. The district is strategically located in close proximity to Nagpur (about 328 kms) and Hyderabad (about. 376 kms), both key markets and gateways to North and South of India respectively. Hingoli is the third least populous district after Sindhudurg and Gadchiroli. Hingoli is an industrially backward area with no presence of big industrial establishments and 60per cent of the population is engaged in agriculture, 72per cent of farmers own small and marginal landholdings the average landholding of farmer is 1.68 ha of land that is higher than the state average of 1.44 ha. Hingoli is a rain fed region and receives an average 700-900 mm of rainfall annually. Hingoli district has only 12 per cent of area under irrigation coverage. Major crops are Soybean, Cotton, Pulses (Red Gram, Green Gram, and Black Gram & Bengal Gram), Wheat and Jowar account for 92 per cent of the gross cropped area in the district. Turmeric (particularly Salem and Pratibha varieties) and Banana with gross margins of 75per cent are high value crops compared to popular crops of Soybean and cotton. Marigold is currently a minor crop but a potential future crop. Hingoli has 18 market yards; 6 being primary APMC markets followed by 12 secondary markets or sub yards.

The APMC's account for around 35per cent of all arrivals (of all commodities combined) done in Hingoli district and rest is sold directly to traders and processors, as well as to aggregators through rural haats. Hingoli also has a vibrant FIG (Farmer Interest Group) activity- particularly in pulses and Turmeric - where several farmer groups are aggregating produce, processing and selling it into end markets. There are 19 rural haats for local level trading. Grade assessment of produce is done manually, though weighing is largely done electronically. APMC is yet to make it mandatory to introduce mechanical grading machines in all markets meeting Agmark standards. Farmers should also be educated and trained on grade assessment parameters for all major crops through training. There exists 108 agro processing units of Cotton Ginning & Pressing Units, Oil Mills (primarily for cotton seed, sunflower, safflower, Kardi, Ground nut etc.), Dal Mills, Turmeric Processing Units, Rice Mills (though few) and Feed Mills. While processing infrastructure in Hingoli is largely based around the key crops, there is no Soybean processing facility, as a bulk of Soybean is transported to Madhya Pradesh for further processing.

In sum, Soybean, cotton, Jowar and Pulses are clearly the major crops in the district and growing at a fast pace, Banana and turmeric are potential growth stories that need to be focussed on for better

optimization of the irrigated areas. Non-traditional crops such as maize and marigold could be crops for the future.

Typically agro-processing businesses in the district are (i) Cotton Ginning & Pressing Units, (ii) Oil Mills (primarily for cotton seed, sunflower, safflower, Kardi, Ground nut etc), (iii) Dal Mills, (iv) Turmeric Processing Units, (v) Rice Mills (though few) and (vi) Feed Mills.

3.2. District Profile: Satara

Satara district is located in the western part of Maharashtra and is situated in the basins of Bhima and Krishna rivers. Out of the total district population of 28.09 lakh, 86per cent reside in rural area and 70per cent workers are engaged in agriculture as cultivators and labourers. The net irrigated area accounts for 1.78 lakh hectares, with around 31per cent of net sown area being irrigated.

Satara being a predominantly rain fed district, kharif crops dominate the cropping pattern. Jowar, Paddy, Groundnut, Soybean, Wheat and Maize are major crops and together, account for 83per cent of total gross cropped area in the district. Jowar is the largest rabi crop and accounts for about 35per cent of gross cropped area. Groundnut, the second largest Kharif crop, accounts for 10.4per cent area, is primarily cultivated for oil extraction purpose. Soybean area has been growing at a fast pace, to 38,751 Ha in 2013. Maize area has grown due to high demand from poultry feed industry. The horticulture area is 7.6per cent and potential crops for promotion include cut flowers, vegetables such as onions, potato, tomato etc, ginger and strawberry.

Though 65per cent trade is through APMCs, followed by 34per cent through traders, processors and DMU, and only 1per cent through 68 rural haats spread across the district. Satara has 11 APMC market yards with 35 sub yards. Some well-known private players include Gits Foods, Cargill Foods, Pravin Chordia Foods, Dohler India (grain based brewery in Pune), Weikfield, Frito Lays (for Potatoes), Mapro (Mango), and Kaybee Exports (ladies finger).

There is a network of 3200 inputs suppliers including private players and well known company distributors for seeds, fertilizers and pesticides.

Extension services are prime responsibility of Agriculture Department, ATMA and KVK, and are supported by the Mahatma Phule Krishi Vidyapeeth (MPKV), Rahuri. There also exist central and specialized research institutions such as first Ginger Research Institute in India at Rahimatpur, Silk Research Institute at Panchgani, Wheat rust research station at Mahabaleshwar, The Central Sugarcane research station at Padegaon and agriculture research station at Karad. Additionally, the extension bodies in Satara are supportive.

The key agri-processing units in the district include Dal Mills, Jaggery making units, Sugar factories, Groundnut oil units and spices (primarily turmeric and chilli), strawberry, and Mango. Satara presents significant opportunities for setting up producer owned small scale businesses for strawberry runner (sapling) production unit, strawberry blast freezing, ginger powder, dehydration and pulping units for Mangoes and Pomegranates, pre-cooling units, packing and cold storage facilities for fruits and vegetables.

Following potential business models/business opportunities were found to be suitable for Satara that is Turmeric (Turmeric powder processing unit), paddy based unit, Strawberry based unit, Strawberry sapling production unit, and Ginger (Ginger powder production unit).

3.3. CBOs selection

After carefully analysing the catchment location, the current agricultural practices and market, LeanAgri has selected 5 CBOs to work with for first year of working with SMART project. All the CBOs are at primary level with many basic facilities required for the full value chain and sustainability of the value chain. Following are name of CBOs Selected for Leanagri's project:

1. Surya Farmers Producer Company Limited, Hingoli
2. Omkarnath Shetkari Gat, Hingoli
3. Pragati Community Managed Resource Centre, Satara
4. Community Managed Resource Centre, Basmat, Hingoli
5. Roshani Community Managed Resource Centre, Hingoli

3.3.1. Key criteria undertaken for the due diligence of CBOs

Hingoli and Satara are primarily major regions of Maharashtra where turmeric is cultivated. Already turmeric growing farmers are easier to provide service and encourage them to take up innovative steps rather than encouraging non-Turmeric farmers. Choosing areas with major crop as turmeric invite interested turmeric procuring industries. This ensures minimum procurement of Turmeric.

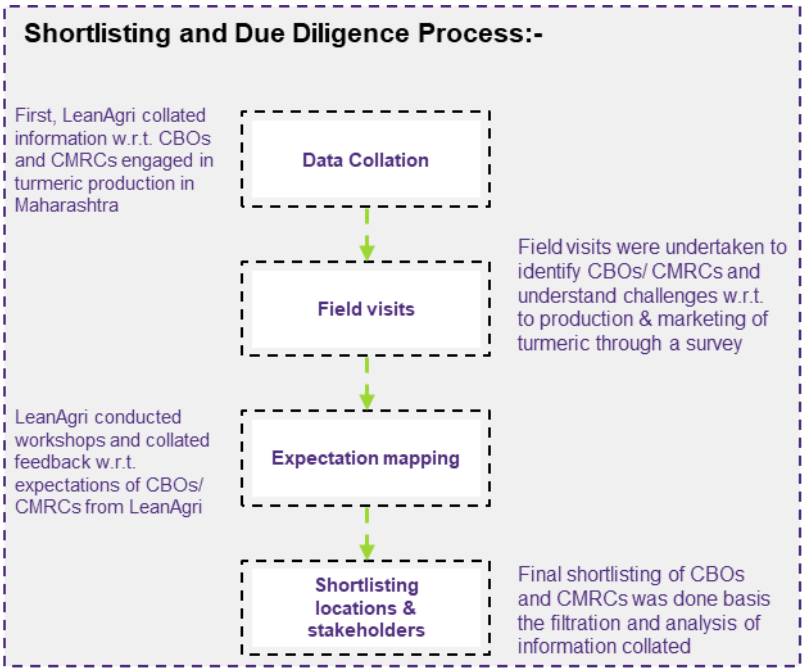
Satara district has ample amount of rainfall, though there are regions where there is water scarcity. Hingoli district falls under Marathwada region where drought was declared in majority of the area in the year 2016 and 2018.

On-ground survey with farmers in the above districts, proved the availability of enough water for growing turmeric crop and electricity to run the water pumps for irrigation. Majority of the farmers depend on rains for June-October cultivation duration. During remaining duration water is fetched from canals or ground water is pumped to fields. Alternatively, measures for guiding farmers for sustainable use of water, electricity and other natural resources will be taken up as a part of this project.

Chapter 4: Cluster Analysis

LeanAgri has conducted various stakeholder consultations in the turmeric cluster area. Such stakeholder consultations were in the form of interactive sessions with farmer groups, NGOs, departments, processors, traders, exporters. Further a baseline survey was also conducted by LeanAgri. The survey done in 4 districts of Maharashtra namely Hingoli, Nanded, Sangli and Satara district and information was collected from about 120 farmers engaged in turmeric farming of different groups to understand the existing practice of turmeric cultivation, existing supply chain and value chain mechanism and the hurdles faced by the farmers.

This baseline survey provides rich insights into conditions faced by Turmeric farmers across the cluster districts. This baseline survey has gathered detailed information on conditions and challenges faced by a large sample of Turmeric farmers. The goal of the survey was to measure turmeric value chain in the cluster before the implementation of various objectives proposed in project.



Below mentioned are a few pictures of meeting conducted with CBOs for baseline survey:

Surya FPO directors at Vasmat, Hingoli

CMRC women farmers at Vasmat, Hingoli

CMRC women farmers at Jawalabazar, Hingoli

CMRC women farmers at Jawalabazar, Hingoli

Visit to non-CBO farmers at Satara

Visit by SMART officials to LeanAgri's farmers

As per the survey conducted, it was found that the experience in farming of the farmers ranged from 1 year to as high as 47 years. The average age of the farmers surveyed is nearly 14 years.

The landholding of the farmers surveyed ranged from 0.5 acre to as high as 9 acres.The average land holding of the farmers in these regions comes to above 2 acres. Out of this the land used for turmeric cultivation is 1 acre.

Another finding of the project is that the farmers are paying huge amount of money for hiring equipment for turmeric farming and processing. They are spending large sum of money for irrigation also . Also a huge amount of money is being spent on farm labour and transportation.

Farmers are also paying large amounts on boiling and polishing machines as they have a huge demand during the harvest season but limited supply leading to higher rental charges.
Farmers have to also pay a 3% commission to the traders for selling their turmeric.

Other Key findings of the survey are

Sr. No.	Particular	Findings
1	Average productivity per acre (Wet)	7.5 MT
2	Average Price Realisation (dry rhizomes) (20% recovery from wet rhizomes)	Rs. 70000/ MT
3	Average Cost of Production per acre	70000/-
4	Average Income Per Farmer (Sales – Cost of Production)	30000/-

Sr. No.	Particular	Findings
5	Harvesting loss	5%
6	Verities	Salem & Rajapuri
7	Curcumin Content	2.5% – 3.5%

Key challenges being faced by the surveyed farmers and CBOs

- Poor Farm Productivity &Traditional Farming Techniques: - India's agricultural productivity is just one-third than that of major producing countries. India's agricultural household's incomes are significantly less. This twin problem of poor farm yields and low farm incomes has resulted in food security problems and farmer suicide not only in India but in all developing countries.
- Lack of traceability: Traceability of produced food is lacking, and kind of chemicals used in the value-chain is not known. Due to this the international market which can fetch high values to farmers are not available to farmers.
- Lack of Quality based and parameterized market availability: The available Turmeric Markets rate the turmeric based on extrinsic values like - thickness, length, shine of the Turmeric finger, which are not quantified at the sale. The rates also fluctuate with a range of Rs. 25-35/kg. LeanAgri plans to bring in third party industry which judges the Turmeric farm produce on the basis of its intrinsic, medicinal value and provide a assured rate range with closer range in the ceiling and floor rate.

Based on the data collected from the survey, LeanAgri shortlisted 5 CBOs to provide expert guidance to reduce the production cost, increase productivity, increase quality and increase revenue of the farmers.

Details of the existing infrastructure for each CBO

Sr. No.	Name of CBO	Existing Infrastructure	Capacity
1	Surya Farmer Producer Company Limited	Cleaning & Grading	3 TPH
2	Omkarnath Shetkari Gat	Godown	300 MT
3	Pragati Community Managed Resource Centre	Turmeric Powder Unit	1 Quintal/Hour
4	Vasmat Community Managed Resource Centre	Not Available	Not Available
5	Roshani Community Managed Resource Centre	Not Available	Not Available

Chapter 5: Applicant's Profile

Buyer Profile

LeanAgri is an agri-tech start-up providing technology solutions to farmers. These technology solutions are for activity planning and decision making based on personalized and real-time data from the farms for market-ready production. LeanAgri provides this activity management to farmers real-time based on soil, water and weather parameters. This solution is provided to farmers through SMS, automated IVR calls and mobile application, all in local language/s. Also, farmers get on-call help throughout the season where they get troubleshooting advice from our expert agronomists.

LeanAgri was started by Sai Gole and Siddharth Dialani from IIT Madras after working with companies like ITC Ltd. LeanAgri which is an optimized decision-making solution for farmers is a result of their research for 3 years. The research is conducted majorly at ICRISAT (International Crop Research Institute forSemi-Aridd Tropics) Hyderabad. LeanAgri has successful results of this dynamic and personalized advisory. Our current research trials conducted at ICAR DOGR (Directorate of Onion and Garlic Research, Rajgurunagar, Pune) have shown 133% increase in yield with respect to MH State University Practices and 38% Increase with respect to ICAR Practices.

LeanAgri has special expertise in Turmeric and Ginger through association with IISR (Indian Institute of Spice Research, Kozhikode) with licenses of IISR Turmeric varieties with better quality, higher curcumin content, short cultivation duration and resistance to fungal diseases. In 2018, we have 200 Acres of farmer area under cultivation with LeanAgri practices, IISR seeds and assured buyback to farmers in Pune, Sangli and Wardha region. LeanAgri's current clients include – Andhra Pradesh Government (SERP – Society of Elimination of Rural Poverty, Vizianagaram, AP), Tata Trust (Vijayawada AP), MannDeshi Bank (Satara, MH), Deepak Fertilizers and Petrochemicals (Pune, MH), Geolife Fertilizers (Mumbai, MH), Yes Bank (Andhra Pradesh - Agri Loans), Olam International and Olam Digital (Karnataka and Andhra Pradesh).

The brief detail of applicant, LeanCrop Technology Solutions Pvt. Ltd. (LeanAgri) is provided in the table below:

Applicant Details

a.	Name of the Applicant	LeanCrop Technology Solutions Pvt. Ltd. (LeanAgri)
b.	Constitution of the Applicant	Private Company
c.	Registered Address of the Applicant	A – 501, Teerth Techno-space, Mumbai Bangalore Highway, Behind Mercedes Benz Show Room, Baner, Pune – 411045

d.	Name and Contact Detail of Promoters	S.No.	Name	Mobile No.	Email ID
		1	Ms. Sai Vijay Gole	988431618	sai.gole@leanagri.com
		2	Mr. Siddharth Dialani	9884308764	siddharth.dialani@leanagri.com

Experience in Agri Business

The following Table summarizes the experience of LeanCrop Technology Solutions Pvt. Ltd.

Background details

Sr. No.	Name of Corporate / SME/ Start-up	Details of business activities / operations
1.	Andhra Pradesh Govt. & Vijayavahini Charitable Trust (Tata Trust)	• Pre-harvesting technical assistance and guidance • Quality Seeds • Buyback Guarantee (buyback of final produce)
2.	Larson & Toubro	
3.	Deepak Fertilizers	
4	Yes Bank & Olam digital	

Demand and specifications

Total turmeric demand for LeanAgri -

Year	Quantity (in MT)
1	1000
2	2500
3	5000
4	6500
5	8000

LeanAgri demand specifications:

Name	Variety Specifications	Quality Specifications	Quality certifying procedure followed
Turmeric	Salem & Rajapuri	Curcumin 2.5%-3.5%	Quality testing will be done by LeanAgri
Turmeric	Pratibha	Curcumin >5%	Quality testing will be done by LeanAgri

i. Pricing and Procurement Policy

- Premium to market rate – To be decided by curcumin content
- +Floor and ceiling price to be calculated at the starting of the season
- LeanAgri shall purchase the turmeric produce from the CBO centre directly after due verification of quality.

ii. Payment Mechanism

LeanAgri shall make the payment of turmeric after 15 of receiving the delivery i.e. T+15 days.

CBO Profile

1. Profile of CBO-1:

S.No.	Particulars	CBO Details
a)	Name of the Project	Productive Partnership Project
b)	Name of CBO	**Surya Farmers Producer Company Limited,Hingoli**
c)	Number of Farmers	535
d)	Total Farm Area	800 acre
e)	Production Data	6000 MT
f)	Varity Produced	Salem & Rajapoore

2. Profile of CBO-2:

S.No.	Particulars	CBO Details
a)	Name of the Project	Productive Partnership Project
b)	Name of CBO	**Omkarnath Shetkari Gat, Hingoli**
c)	Number of Farmers	53
d)	Total Farm Area	42 acre
e)	Production Data	263 MT
f)	Varity Produced	Salem & Rajapuri

3. Profile of CBO-3:

S.No.	Particulars	CBO Details
a)	Name of the Project	Productive Partnership Project
b)	Name of CBO	**Pragati Community Managed Resource Center**
c)	Number of Farmers	4754, 90 member engaged in turmeric cultivation
d)	Total Farm Area	35 acre
e)	Production Data	260 MT
f)	Varity Produced	Salem

4. Profile of CBO-4:

S.No.	Particulares	CBO Details
a)	Name of the Project	Productive Partnership Project
b)	Name of CBO	**Community Managed Resource Centre, Hingoli**
c)	Number of Farmers/Members	3042, 200 member engaged in turmeric cultivation
d)	Total Farm Area	590 acre
e)	Production Data	4425 MT
f)	Varity Produced	Salem

5. Profile of CBO-5:

S.No.	Particulares	CBO Details
a)	Name of the Project	Productive Partnership Project
b)	Name of CBO	**Roshani Community Managed Resource Centre, Hingoli**
c)	Number of Farmers	2890, 200 member engaged in turmeric cultivation
d)	Total Farm Area	600 Acre
e)	Production Data	4500 MT
f)	Varity Produced	Salem & Rajapuri

Chapter 6: Project Proposal

The current project is envisaged by LeanCrop Technology Solutions Pvt. Ltd. (LeanAgri) who will be acting as a technology, knowledge and marketing partner to the identified CBOs. The company aims at targeting to the small and marginal farmers especially women farmers. The overall objective of the project is to increase the farm income with the help of end-to-end consultancy in agronomy, traceability and marketing backed with technology.

The primarily chosen commodity is Turmeric in which LeanAgri will be analyzing 30+ data parameters collected from the farm via soil, cultivable land area, water, climate and historic crop data to develop season-long calendar of farm activities in regards to nutrient management and pest-disease management and direct procurement from CBO. They will also be providing the high value seeds of improved varieties in associated with IISR (Indian Institute of Spice Research, Kozhikode).

Hingoli and Satara are primarily major regions of Maharashtra where turmeric is cultivated. Already turmeric growing farmers are easier to provide service and encourage them to take up innovative steps rather than encouraging non-Turmeric farmers. Choosing areas with major crop as turmeric invite interested turmeric procuring industries.

Problems to be addressed:

The problems LeanAgri is focused to solve via this project are-

- Poor Farm Productivity & Traditional Farming Techniques- India’s agricultural productivity is just one-third than that of major producing countries. India's agricultural household’s incomes are significantly less. This twin problem of poor farm yields and low farm incomes has resulted in food security problems and farmer suicide not only in India but in all developing countries.
- Lack of traceability – Traceability of produced food is lacking, and kind of chemicals used in the value-chain is not known. Due to this the international market which can fetch high values to farmers are not available to farmers.
- Lack of Quality based and parameterized market availability- The Available Turmeric Markets rate the turmeric based on extrinsic values like - thickness, length, shine of the Turmeric finger, which are not quantified at the sale. The rates also fluctuate with a range of Rs. 25-35/kg.
- Unable to get fair prices for their produce- Due to lack of knowledge and unfair practices by the traders, the turmeric farmers end up getting lower prices for their hardwork.
- Dependency on only local market.

Proposed Intervention

1. ***Capacity Building of CBOs***
    a. LeanAgri proposes to undertake training workshop for the CBOs so as to educate them about benefits of use of better farming practices and also select from the CBO a certain number of farmers to provide further services. This activity shall help LeanAgri to determine the number of farmers interested to avail their service and also their capacity to invest.

b. LeanAgri proposes to provide, to the farmers selected from the above process, technical service which involves soil testing, promoting residue free production and for traceability assistance. This activity helps them to decide the time for sowing, using fertilisers, irrigation requirement and also harvesting. Following the action plan as informed by LeanAgri shall help in increase in productivity and also quality of the produce. They shall also be providing marketing assistance for the quality produce.

c. LeanAgri shall also provide to a select farmers' high variety of turmeric seeds (Pratibha) sourced from IISR (Indian Institute of Spice Research) which has a higher curcumin (>5%) and a disease resistant character. Production of a variety with higher curcumin content shall enable them to access the international market where turmeric with higher curcumin content is desirable helping the farmers to get higher profits.

d. GAP certification is also proposed as a means of capacity building of the farmer members attached to the CBOs. This shall enable to ascertain the quality of the produce. This is helpful in selling their produce to the buyers by building a trust between them and help in designing future course of action in the next production cycle.

2. Capital Expenditure Requirement

a. Machinery-
   i. The CBOs have proposed certain machineries for custom hiring like planter, harvester, boiler and polisher for the turmeric crop. The CBOs shall provide the same to their farmer members on rent at a cost lower than the market rate. Also this will help the farmers to get the machinery easily against earlier periods where there would have been longer waiting time for hiring the said equipments.
   ii. The CBOs have also proposed tractor so as to help them in transportation and also using the same to attach with the above proposed machineries and giving out the same on hire.

b. Infrastructure
   i. The CBOs who do not an infrastructure to run their activities have proposed a collection centre cum office for the easy functioning and also for storing of the produced goods.

3. Buyback Arrangement
   a. LeanAgri is also providing buyback guarantee for the produce if the farmers follow the production methods as instructed by them. The farmers will have the option of selling their produce to LeanAgri or else if they so desire, can sell their produce in the market. The main motive is to increase the income of the farmers. LeanAgri plans to bring in third party industry which judges the Turmeric farm produce on the basis of its intrinsic, medicinal value and provide an assured rate range with closer range in the ceiling and floor rate.

Overall Objectives:

- Reduction in cost of inputs - Season-long schedule developed post analysis reduces the cost of inputs (nutrient management, pest and disease management) by 10-15% compared to previous season.

- Increment in the farm productivity- Following the scheduled activities with a compliance rate of 80% or higher results in increment in farm produce by 30-40% compared to previous season. LeanAgri works with prestigious national and international institutes like ICRISAT (International Crop Research Institute for Semi-Arid Tropics) and ICAR (Indian Council of Agriculture Research) for

research and validations. Their trials with ICAR proved increase in quality produce yield by 38% w.r.t. ICAR based practices and 133% increase with respect to Maharashtra state based practices.

- Market availability for Turmeric based on Turmeric intrinsic value- The associated farmers will be directly linked to the industry valuing the turmeric by its intrinsic value of curcumin content. To address any fluctuations, the rates will have floor and ceiling rates with premium decided as per curcumin in the final produce.

- Faster transactions to the Farmers by the Market- Usual transfer of amounts in the existing market takes a month(minimum). The market linkage provided by LeanAgri aims to complete the transactional procedure within 2 weeks from the date of procurement of turmeric from farmer.

Key stakeholders and roles being played by them

- Farmers: The sole focus of the project is to benefit the farmers directly by increasing their farm income, their knowledge for scientific agronomy techniques and provide them secured market linkage. The introduction of industry and high value seeds which provide a transparent judgement metric which becomes the basis of earning revenue creates a sustainable income model for farmers.

- Industry: Industry values traceability, quality and regular secured amount of supply. With LeanAgri monitoring the produce right from seeds to the final produce and presenting all the activities on a single dashboard, namely LeanEnterprise, the industry is able to benefit its own backward value chain.

- CBOs and monitoring bodies like MAVIM: The FPOs and other organizations associated with farmers will be directly supported in their mission to uplift the farmer lifestyle and providing an easy digital dashboard to track and monitor all the activities. LeanAgri provides features like monthly input costs, farmer response rate of instructions, compliance rate of following the scheduled activities, yield estimations and complete individual farmer information.

- LeanAgri (Technological partner): LeanAgri shall have the function of meeting and on-boarding farmers, soil collection and testing, provision of quality seeds and inputs, holding periodic farmer meetings, delivering and ensuring compliance rate of season-long calendar of farm activities, agronomy support and customer service during the season, market linkage for the farm produce, executing turmeric test procedure and creating financial systems for transparent money transfers. This platform can also be used by SMART for monitoring and data collection purpose.

Chapter 7: Proposed Project Components

1. Profile of CBO-1:

S.No.	Particulars	CBO Details
a)	Name of CBO	**Surya Farmers Producer Company Limited,Hingoli**
b)	Key Challenges being faced by them	**Production side** – Need of quality seed material and production assistance **Post-Harvest side** – Need of mechanization for labour intensive processes **Marketing** – Need of better market

Proposed interventions:

Sr. No.	Particulars	Purpose
1	Training Workshops (5 Years - LeanAgri)	1.Reduction in Cultivation Cost 2. Increment in productivity
2	Soil Testing, residue free production and traceability assistance (3 Years per farmer)	1.Reduction in Cultivation Cost 2. Increment in productivity
3	Improved seeds (IISR Certified Vendor/ LeanAgri) Year 1 - 20 Acre	1.Reduction in Cultivation Cost 2. Increment in productivity
4	Quality Inputs (Certified vendor/ LeanAgri) Bio-fertilizers and Bio-pesticides Only for seed producing farmers	1.Reduction in Cultivation Cost 2. Increment in productivity
5	Turmeric planter	This planter can perform following function: 1.Open a furrow 2.Meter the seed. 3.Deliver the seed and place it appropriately in, the furrow. 4.Labor cost reduced 5.less time consuming
6	Turmeric harvester	1. Oscillating motion of the blade separates the turmeric rhizomes from soil without any damage. 2. It has a field capacity of about 0.2 acre per hour while consuming 1.5 litre of fuel (diesel). 3. The cost of harvesting per acre almost comes to half if the present machine is used for harvesting and labourers are engaged for collection.
7	Turmeric Boiler	1.Reduce Boiling Time

		2. Improvement in colour 3. Increase productivity
8	Turmeric Polisher	1.Removing Dust particles
9	Tractor	1.Easy transportation of farm produce 2.Help in use of other custom hiring equipment

2. Profile of CBO-2:

S.No.	Particulars	CBO Details
a)	Name of the CBO	**Omkarnath Shetkari Gat**
b)	Key Challenges being faced by them	**Production side** – Need of quality seed material and production assistance **Post-Harvest side** – Need of mechanization for labour intensive processes **Marketing** – Need of better market

Proposed interventions:

Sr.No.	Particulars	Purpose
1	Training Workshops (3 Years - LeanAgri)	1.Reduction in Cultivation Cost 2. Increment in productivity
2	Soil Testing, residue free production and traceability assistance	1.Reduction in Cultivation Cost 2. Increment in productivity
3	Improved seeds (IISR Certified Vendor/ LeanAgri)	1.Reduction in Cultivation Cost 2. Increment in productivity
4	Quality Inputs (Certified vendor/ LeanAgri) Bio-fertilizers and Bio-pesticides Only for seed producing farmers	1.Reduction in Cultivation Cost 2. Increment in productivity
5	Turmeric planter	This planter can perform following function: 1.Open a furrow 2.Meter the seed. 3.Deliver the seed and place it appropriately in, the furrow. 4.Labor cost reduced 5.less time consuming
6	Turmeric harvester	1. Oscillating motion of the blade separates the turmeric rhizomes from soil without any damage. 2. It has afield capacity of about 0.2 acre per hour while consuming 1.5 litre of fuel (diesel). 3.The cost of harvesting per acre almost comes to half if the present machine is used for harvesting and labourers are engaged for collection.
7	Turmeric Boiler	1.Reduce Boiling Time 2. Improvement in colour 3. Increase productivity
8	Turmeric Polisher	1.Removing Dust particles
9	Tractor	1.Easy transportation of farm produce 2.Help in use of other custom hiring equipment

3 Profile of CBO-3:

S.No.	Particulars	CBO Details
a)	Name of CBO	**Pragati Community Managed Resource Center**
b)	Key Challenges being faced by them	**Production side** – Working capital, seeds, Fertiliser, lesser production, Agronomy knowledge **Post-Harvest side –**Transport, Manpower, Storage, Working capital **Marketing –** Manpower, Packaging, labelling, Technical Inputs

Proposed interventions:

Sr.No.	Particulars	Purpose
1	Training Workshops (3 Years - LeanAgri)	1.Reduction in Cultivation Cost 2. Increment in productivity
2	Soil Testing, residue free production and traceability assistance	1.Reduction in Cultivation Cost 2. Increment in productivity
3	Improved seeds (IISR Certified Vendor/ LeanAgri) Year 1 - 100 Acre	1.Reduction in Cultivation Cost 2. Increment in productivity
4	Quality Inputs (Certified vendor/ LeanAgri) Bio-fertilizers and Bio-pesticides Only for seed producing farmers	1.Reduction in Cultivation Cost 2. Increment in productivity
5	Turmeric planter	This planter can perform following function: 1.Open a furrow 2.Meter the seed. 3.Deliver the seed and place it appropriately in, the furrow. 4.Labor cost reduced 5.less time consuming
6	Turmeric harvester	1.Oscillating motion of the blade separates the turmeric rhizomes from soil without any damage. 2.It has afield capacity of about 0.2 acre per hour while consuming 1.5 litre of fuel (diesel). 3.The cost of harvesting per acre almost comes to half if the present machine is used for harvesting and labourers are engaged for collection.
7	Turmeric Boiler	1.Reduce Boiling Time 2. Improvement in colour 3. Increase productivity
8	Turmeric Polisher	1.Removing Dust particles
9	Tractor	1.Easy transportation of farm produce 2.Help in use of other custom hiring equipment
10	Collection Unit & Warehouse	1.Procurement and Storage of Turmeric

4 Profile of CBO-4:

S.No.	Particulars	CBO Details
a)	Name of CBO	**Community Managed Resource Centre, Vasmat, Hingoli**
b)	Key Challenges being faced by them	**Production side-** Low quality seed , low production **Post-Harvest side-** No boiler , dryer , polisher facilities available in group, transport not available , Rate fluctuation **Marketing** – Need of better market

Proposed interventions:

Sr.No.	Particulars	Purpose
1	Training Workshops (3 Years - LeanAgri)	1.Reduction in Cultivation Cost 2. Increment in productivity
2	Soil Testing, residue free production and traceability assistance	1.Reduction in Cultivation Cost 2. Increment in productivity
3	Improved seeds (IISR Certified Vendor/ LeanAgri) Year 1 - 100 Acre	1.Reduction in Cultivation Cost 2. Increment in productivity
4	Quality Inputs (Certified vendor/ LeanAgri) Bio-fertilizers and Bio-pesticides Only for seed producing farmers	1.Reduction in Cultivation Cost 2. Increment in productivity
5	Turmeric planter	This planter can perform following function: 1.Open a furrow 2.Meter the seed. 3.Deliver the seed and place it appropriately in, the furrow. 4.Labor cost reduced 5.less time consuming
6	Turmeric harvester	1.Oscillating motion of the blade separates the turmeric rhizomes from soil without any damage. 2.It has afield capacity of about 0.2 acre per hour while consuming 1.5 litre of fuel (diesel). 3.The cost of harvesting per acre almost comes to half if the present machine is used for harvesting and labourers are engaged for collection.
7	Turmeric Boiler	1.Reduce Boiling Time 2. Improvement in colour 3. Increase productivity
8	Turmeric Polisher	1.Removing Dust particles
9	Tractor	1.Easy transportation of farm produce 2.Help in use of other custom hiring equipment
10	Collection Unit & Warehouse	1.Procurement and Storage of Turmeric

5 Profile of CBO-5:

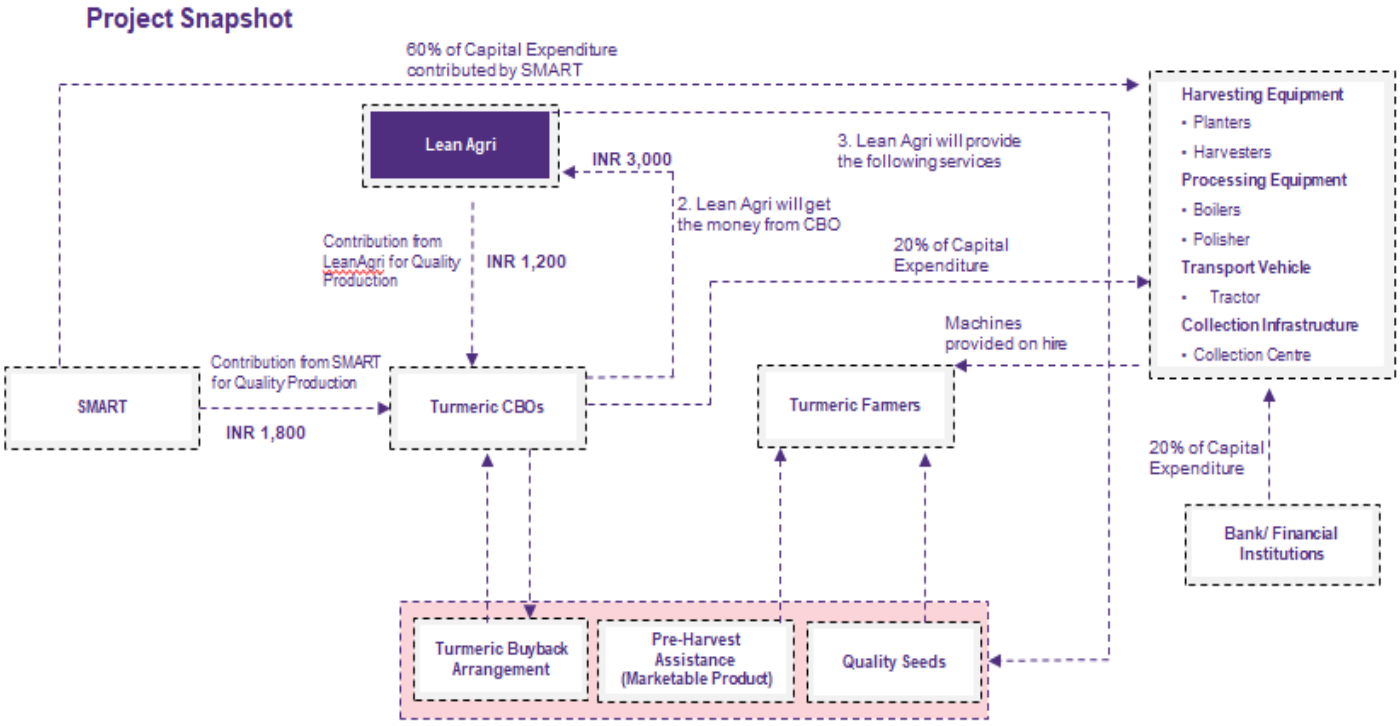
S.No.	Particulares	CBO Details
a)	Name of CBO	**Roshani Community Managed Resource Centre, Javlabajar, Hingoli**
b)	Key Challenges being faced by them	**Production side** – Need of quality seed material and production assistance **Post-Harvest side** – Need of mechanization for labour intensive processes **Marketing** – Need of better market

Proposed interventions:

Sr.No.	Particulars	
1	Training Workshops (3 Years - LeanAgri)	1.Reduction in Cultivation Cost 2. Increment in productivity
2	Soil Testing, residue free production and traceability assistance	1.Reduction in Cultivation Cost 2. Increment in productivity
3	Improved seeds (IISR Certified Vendor/ LeanAgri) Year 1 - 100 Acre	1.Reduction in Cultivation Cost 2. Increment in productivity
4	Quality Inputs (Certified vendor/ LeanAgri) Bio-fertilizers and Bio-pesticides Only for seed producing farmers	1.Reduction in Cultivation Cost 2. Increment in productivity
5	Turmeric planter	This planter can perform following function: 1.Open a furrow 2.Meter the seed. 3.Deliver the seed and place it appropriately in, the furrow. 4.Labor cost reduced 5.less time consuming
6	Turmeric harvester	1.Oscillating motion of the blade separates the turmeric rhizomes from soil without any damage. 2.It has afield capacity of about 0.2 acre per hour while consuming 1.5 litre of fuel (diesel). 3.The cost of harvesting per acre almost comes to half if the present machine is used for harvesting and labourers are engaged for collection.
7	Turmeric Boiler	1.Reduce Boiling Time 2. Improvement in colour 3. Increase productivity
8	Turmeric Polisher	1.Removing Dust particles
9	Tractor	1.Easy transportation of farm produce 2.Help in use of other custom hiring equipment
10	Collection Unit & Warehouse	1.Procurement and Storage of Turmeric

Chapter 8: Project Implementation

Below mentioned is the graphical representation of the project implementation:



LeanAgri shall provide package of practice costing Rs. 3000/- per farmer for improvement of productivity and reduction in cost of production of turmeric. SMART shall contribute Rs. 1800/- per farmer as subsidy for the package of practice and the balance Rs. 1200/- shall be discounted by LeanAgri.

Also the CBOs shall with 60% subsidy from SMART, 20% as its own capital and balance 20% as loan from banks/financial institutions shall procure machines like planters, harvesters, boilers, polishers and tractors and also collection centre wherever required. The CBO shall provide these machines on hire to the farmers at lower than market rate.

Implementation Plan

The project shall kick off as soon as the same is approved by SMART. LeanAgri shall firstly collect member data w.r.t. their land holding and cropping pattern from the CBO and also the status of possession of the land. Then they shall organise training workshops to get to know their current method of farm practices and also inform them the services which shall be offered by LeanAgri to them and the charges for that after duly explaining them the future benefits expected due to this intervention. After this, LeanAgri with the help of CBO shall select few farmers from the group for giving its services.

After the selection of the farmers who are willing to take services from LeanAgri, Lean Agri shall carry on the following functions:

- Training of CBOs personals will be carried out, who will be in charge of this project and transactions for the different compliances of traceability aspects. They shall also be made aware about GAP(Good Agriculture Practice) and certifications and its execution
- Geo-tagging of farms – Geo-tagging and geo-fencing of the farm locations will be carried out to know exact area under cultivation
- Soil collection and testing – Soil collection and testing of all the farms under cultivation of the turmeric under LeanAgri program will be done
- Provision of improved seeds – Improved seed varieties will be provided to selected farmers in association from IISR
- Season-long calendar - Generation of season-long calendar for farms, activities of the farm as per compliance of various norms of residue free production, weather based personalized schedule for the farmers
- Updating farmers of various actions to be undertaken until pre-harvesting – SMS, IVR, Mobile application-based updates and in-person assistance at farm
- Compliance check – Farmers will be checked for the compliance of the activities though online and offline checks throughout the season to comply with the traceability norms in food production.
- The software developed by Leanagri shall contain information farmer name, contact details, crops grown, sowing date, irrigation type and nutrient type preference i.e. organic/ inorganic/ integrated

- Role of CBO
  - CBO will get the transparency of the communication between LeanAgri and farmers – Dashboard will be shared with each CBO and Maharashtra Government officials for the updates about farmers, activities, compliances etc.
  - All the material and financial transaction will be carried with CBO for individual farmer
  - CBO will be responsible for leadership activities with farmers, timely payments from and to the farmers, timely material distribution to farmers

- Post-harvest services to be provided by CBO
  - Provision of post-harvest implements like – Boiler, polisher for timely processing of turmeric rhizomes at a lower rent
  - Provision of collection unit – Collection unit for farmers to keep the material shipping ready

- Post-harvest Process with LeanAgri
  - Curcumin testing for farmers with improved variety and pricing based on curcumin availability
  - Quality checking of all the farm materials
  - Numbering and allotment of farmers for collection unit pickup facility
  - Pickup of produced turmeric from collection facility
  - Payment to farmers via CBO Bank account within 10 days from the pickup

Impact Assessment

Sr. No.	Intervention	Start date	End date	Impact
1	Training & workshop	Y1	Y5	Workshop for helping select the farmers for the intervention. 3700 farmers trained.
2	Soil testing, traceability, ERP	Y1	Y5	• Increase in productivity of turmeric from 7.5 MT to 10 MT per acre in year 1 • Better price realisation by more than 3%
3	New Improved Seed	Y1	Y5	• Introduction of higher curcumin containing variety (Pratibha) shall help them get better prices in the market. • Grant access the export market as well.
4	Custom Hiring Equipment	Y1	Y1	• Easy availability of farm equipment to farmers at a subsidized rate
9	GAP certification and residue management	Y1	Y5	• Trust builder between buyers and CBO • Certificate for better farming practice

Chapter 9: Project Financials

Overall Project Costs:

Sr. No.	Item	Surya FPO	Omkarnath Shetkari Gat	Pragati CMRC	Vasmat CMRC	Roshani CMRC Javlabazar	TOTAL
1	Capacity Building of CBO	9	6	6	7.5	7.5	**36**
2	Quality Production	93.1	44.5	53.8	97.6	97.6	**386.60**
3	Post-Harvest facilities	18.5	18.5	28.5	28.5	28.5	**122.5**
4	Agri-Logistics	-	-	-	-	-	**-**
5	Preliminary & Pre-operative Exp	0.37	0.37	0.57	**0.57**	**0.57**	**2.45**
	Total Project Cost (Lakh)	**120.97**	**69.37**	**88.87**	**134.17**	**134.17**	**547.55**

1	Manpower and operating Exp. to be funded to MAVIM- PIU			10.86	10.86	10.86	**32.58**

Project Means of Finance:

Sr. No.	Item	Surya FPO	Omkarnath Shetkari Gat	Pragati CMRC	Vasmat CMRC	Roshani CMRC Javlabazar	TOTAL
1	Private Partner	19.80	11.4	13.2	24.6	24.6	**82.80**
2	CBOs	21.29	12.65	16.65	23.37	23.37	**97.32**
3	Govt. Subsidy	76.18	41.62	53.32	80.5	80.5	**342.93**
4	Bank Loan	3.7	3.7	5.7	5.7	5.7	**24.5**
	Total Funding	**120.97**	**69.37**	**88.87**	**134.17**	**134.17**	**547.55**

Component wise Project Cost and Means of Finance

Figures in Rs. Lakh

Activity Name	Nature of activity	Year Wise Implementation schedule					Total Cost	Grant under SMART (Amount)	Buyer Contribution (Amount)	CBO Contribution (Amount)	Bank Term Loan (Amount)	Funds from MAVIM (Amount)
		Y1	Y2	Y3	Y4	Y5						
Training Workshops	Capacity Building	12.00	12.00	12.00	-	-	36.00	36.00	-	-		
Soil testing, tracebality assistance and agronomy assistance	Quality production	24.00	48.00	69.00	45.00	21.00	207.00	124.20	82.80	-		
Improved seeds (IISR Certified Vendor/ LeanAgri)	Quality production	36.00	36.00	19.20	19.20	19.20	129.60	77.76	-	51.84		
Turmeric planter	Capex	5.00	-	-	-	-	5.00	3.00	-	1.00	1.00	
Turmeric Harvester	Capex	7.50	-	-	-	-	7.50	4.50	-	1.50	1.50	
Turmeric Boiler	Capex	30.00	-	-	-	-	30.00	18.00	-	6.00	6.00	
Turmeric Polisher	Capex	10.00	-	-	-	-	10.00	6.00	-	2.00	2.00	
Tractor	Capex	40.00	-	-	-	-	40.00	24.00	-	8.00	8.00	
Collection unit	Capex	30.00	-	-	-	-	30.00	18.00	-	6.00	6.00	
Certifications - GAP, Recidue free production	Quality production	10.00	10.00	10.00	10.00	10.00	50.00	30.00	-	20.00	-	-
Preliminary and pre-operative Exp	P&P	2.45	-	-	-	-	2.45	1.47	-	0.98	-	-
Grand Total		**206.95**	**106.00**	**110.20**	**74.20**	**50.20**	**547.55**	**342.93**	**82.8**	**97.32**	**24.5**	**0**

Activity Name	Nature of activity	Year Wise Implementation schedule					Total Cost	Grant under SMART (Amount)	Buyer Contribution (Amount)	CBO Contribution (Amount)	Bank Term Loan (Amount)	Funds from MAVIM (Amount)
Manpower & Other Exp.- to be funded to MAVIM-PIU	Contingencies	10.56	10.86	11.16	-	-	32.58	-	-	-	-	32.58

CBO 1: Surya FPCL

Figures in Rs. Lakh

S. No.	Activity Name	Nature of activity	Year Wise Implementation schedule					Total Cost	Grant under SMART (Amount)	Buyer Contribution (Amount)	CBO Contribution (Amount)	Bank Term Loan (Amount)
			Y1	Y2	Y3	Y4	Y5					
1	Training Workshops	Capacity Building	3	3	3			9.00	9.00	-	-	
2	Soil testing, tracebality assistance and agronomy assistance Year 1: 250 Farmers Year 2: 450 Farmers Year 3: 550 Farmers Year 4: 300 Farmers Year 5: 100 Farmers	Quality Production	7.5	13.5	16.5	9	3	49.50	29.70	19.80	-	
3	Improved seeds (IISR Certified Vendor/ LeanAgri) Year 1 = 20 Acre Year 2 = 20 Acre Year 3 to 5= 10 Acre	Quality Production	9.6	9.6	4.8	4.8	4.8	33.60	20.16	-	13.44	
4	Turmeric planter	Capex	1					1.00	0.60	-	0.20	0.20
5	Turmeric Harvester	Capex	1.5					1.50	0.90	-	0.30	0.30
6	Turmeric Boiler	Capex	6					6.00	3.60	-	1.20	1.20
7	Turmeric Polisher	Capex	2					2.00	1.20	-	0.40	0.40
8	Tractor	Capex	8					8.00	4.80	-	1.60	1.60
9	Collection unit	Capex						-	-	-	-	-
10	Certifications - GAP, Recidue free production	Quality Production	2	2	2	2	2	10.00	6.00	-	4.00	-
11	Preliminary And Pre-operative Exp		0.37					0.37	0.22		0.15	
	Grand Total		**40.97**	**28.10**	**26.30**	**15.80**	**9.80**	**120.97**	**76.18**	**19.80**	**21.29**	**3.70**

CBO 2: Omkarnath Shetkari Gat

Figures in Rs. Lakh

S. No.	Activity Name	Nature of activity	Year Wise Implementation schedule					Total Cost	Grant under SMART (Amount)	Buyer Contribution (Amount)	CBO Contribution (Amount)	Bank Term Loan (Amount)
			Y1	Y2	Y3	Y4	Y5					
1	Training Workshops	Capacity Building	2	2	2			6.00	6.00	-	-	
2	Soil testing, tracebality assistance and agronomy assistance Year 1: 50 Farmers Year 2: 150 Farmers Year 3: 250 Farmers Year 4: 200 Farmers Year 5: 100 Farmers	Quality Production	1.5	4.5	7.5	6	3	22.50	13.50	9.00	-	
3	Improved seeds (IISR Certified Vendor/ LeanAgri) Year 1 to 5= 5 Acre	Quality Production	2.4	2.4	2.4	2.4	2.4	12.00	7.20	-	4.80	
4	Turmeric planter	Capex	1					1.00	0.60	-	0.20	0.20
5	Turmeric Harvester	Capex	1.5					1.50	0.90	-	0.30	0.30
6	Turmeric Boiler	Capex	6					6.00	3.60	-	1.20	1.20
7	Turmeric Polisher	Capex	2					2.00	1.20	-	0.40	0.40
8	Tractor	Capex	8					8.00	4.80	-	1.60	1.60
9	Collection unit	Capex						-	-	-	-	-
10	Certifications - GAP, Recidue free production	Quality Production	2	2	2	2	2	10.00	6.00	-	4.00	-
11	Preliminary And Pre-operative Exp	P&P	0.37					0.37	0.22		0.15	
	Grand Total		**26.77**	**10.90**	**13.90**	**10.40**	**7.40**	**69.37**	**44.02**	**9.00**	**12.65**	**3.70**

CBO 3: Pragati CMRC, Satara

Figures in Rs. Lakh

S. No.	Activity Name	Nature of activity	Year Wise Implementation schedule					Total Cost	Grant under SMART (Amount)	Buyer Contribution (Amount)	CBO Contribution (Amount)	Bank Term Loan (Amount)	Funds to MAVIM (Amount)
			Y1	Y2	Y3	Y4	Y5						
1	Training Workshops	Capacity Building	2	2	2			6.00	6.00	-	-		
2	Soil testing, tracebality assistance and agronomy assistance Year 1-3: 100 Farmers increasing (Every year)	Quality Production	3	6	9	6	3	27.00	16.20	10.80	-		
3	Improved seeds (IISR Certified Vendor/ LeanAgri) Year 1 = 10 Acre Year 2 = 10 Acre Year 3 to 5= 5 Acre	Quality Production	4.8	4.8	2.4	2.4	2.4	16.80	10.08	-	6.72		
4	Turmeric planter - CMRC	Capex	1					1.00	0.60	-	0.20	0.20	
5	Turmeric Harvester - CMRC	Capex	1.5					1.50	0.90	-	0.30	0.30	
6	Turmeric Boiler - CMRC	Capex	6					6.00	3.60	-	1.20	1.20	
7	Turmeric Polisher - CMRC	Capex	2					2.00	1.20	-	0.40	0.40	
8	Tractor - CMRC	Capex	8					8.00	4.80	-	1.60	1.60	
9	Collection unit - CMRC	Capex	10					10.00	6.00	-	2.00	2.00	
10	Certifications - GAP, Recidue free production	Quality Production	2	2	2	2	2	10.00	6.00	-	4.00	-	
12	Preliminary And Pre-operative Exp	P&P	0.57					0.57	0.34		0.23		
	Grand Total (A+B+C+D)		**40.87**	**14.8**	**15.4**	**10.4**	**7.4**	**88.87**	**55.72**	**10.8**	**16.65**	**5.7**	**0**

S. No.	Activity Name	Nature of activity	Year Wise Implementation schedule					Total Cost	Grant under SMART (Amount)	Buyer Contribution (Amount)	CBO Contribution (Amount)	Bank Term Loan (Amount)	Funds to MAVIM (Amount)
1	Manpower & Other Exp.- to be funded to MAVIM-PIU	Contingencies	3.52	3.62	3.72			10.86	-		-		10.86

CBO 4: Vasmat CMRC, Vasmat

Figures in Rs. Lakh

S. No.	Activity Name	Nature of activity	Year Wise Implementation schedule					Total Cost	Grant under SMART (Amount)	Buyer Contribution (Amount)	CBO Contribution (Amount)	Bank Term Loan (Amount)	Funds to MAVIM (Amount)
			Y1	Y2	Y3	Y4	Y5						
1	Training Workshops	Capacity Building	2.5	2.5	2.5			7.50	7.50	-	-		
2	Soil testing, tracebality assistance and agronomy assistance Year 1: 200 Farmers Year 2: 400 Farmers Year 3: 600 Farmers Year 4: 400 Farmers Year 5: 200 Farmers	Quality Production	6	12	18	12	6	54.00	32.40	21.60	-		
3	Improved seeds (IISR Certified Vendor/ LeanAgri) Year 1 = 20 Acre Year 2 = 20 Acre Year 3 to 5= 10 Acre	Quality Production	9.6	9.6	4.8	4.8	4.8	33.60	20.16	-	13.44		
4	Turmeric planter - CMRC	Capex	1					1.00	0.60	-	0.20	0.20	
5	Turmeric Harvester - CMRC	Capex	1.5					1.50	0.90	-	0.30	0.30	
6	Turmeric Boiler - CMRC	Capex	6					6.00	3.60	-	1.20	1.20	
7	Turmeric Polisher - CMRC	Capex	2					2.00	1.20	-	0.40	0.40	
8	Tractor - CMRC	Capex	8					8.00	4.80	-	1.60	1.60	
9	Collection unit - CMRC (800 Sq. ft.)	Capex	10					10.00	6.00	-	2.00	2.00	
10	Certifications - GAP, Recidue free production	Quality Production	2	2	2	2	2	10.00	6.00	-	4.00	-	
11	Preliminary And Pre-operative Exp		0.57					0.57	0.34		0.23		
	Grand Total (A+B+C+D)		**49.17**	**26.10**	**27.30**	**18.80**	**12.80**	**134.17**	**83.50**	**21.60**	**23.37**	**5.70**	**0**

S. No.	Activity Name	Nature of activity	Year Wise Implementation schedule					Total Cost	Grant under SMART (Amount)	Buyer Contribution (Amount)	CBO Contribution (Amount)	Bank Term Loan (Amount)	Funds to MAVIM (Amount)
			Y1	Y2	Y3	Y4	Y5						
1	Manpower & Other Exp.- to be funded to MAVIM-PIU	Contingencies	3.52	3.62	3.72			10.86	-				10.86

CBO 5: Roshani CMRC, Javlabajar

Figures in Rs. Lakh

S. No.	Activity Name	Nature of activity	Year Wise Implementation schedule					Total Cost	Grant under SMART (Amount)	Buyer Contribution (Amount)	CBO Contribution (Amount)	Bank Term Loan (Amount)	Funds to MAVIM (Amount)
			Y1	Y2	Y3	Y4	Y5						
1	Training Workshops	Capacity Building	2.5	2.5	2.5			7.50	7.50	-	-		
2	Soil testing, tracebality assistance and agronomy assistance Year 1: 200 Farmers Year 2: 400 Farmers Year 3: 600 Farmers Year 4: 400 Farmers Year 5: 200 Farmers	Quality Production	6	12	18	12	6	54.00	32.40	21.60	-		
3	Improved seeds (IISR Certified Vendor/ LeanAgri) Year 1 = 20 Acre Year 2 = 20 Acre Year 3 to 5= 10 Acre	Quality Production	9.6	9.6	4.8	4.8	4.8	33.60	20.16	-	13.44		
4	Turmeric planter - CMRC	Capex	1					1.00	0.60	-	0.20	0.20	
5	Turmeric Harvester - CMRC	Capex	1.5					1.50	0.90	-	0.30	0.30	
6	Turmeric Boiler - CMRC	Capex	6					6.00	3.60	-	1.20	1.20	
7	Turmeric Polisher - CMRC	Capex	2					2.00	1.20	-	0.40	0.40	
8	Tractor - CMRC	Capex	8					8.00	4.80	-	1.60	1.60	
9	Collection unit - CMRC (800 Sq. ft.)	Capex	10					10.00	6.00	-	2.00	2.00	
10	Certifications - GAP, Recidue free production	Quality Production	2	2	2	2	2	10.00	6.00	-	4.00	-	
11	Preliminary And Pre-operative Exp		0.57					0.57	0.34		0.23		
	Grand Total (A+B+C+D)		**49.17**	**26.10**	**27.30**	**18.80**	**12.80**	**134.17**	**83.50**	**21.60**	**23.37**	**5.70**	**0**

S. No.	Activity Name	Nature of activity	Year Wise Implementation schedule					Total Cost	Grant under SMART (Amount)	Buyer Contribution (Amount)	CBO Contribution (Amount)	Bank Term Loan (Amount)	Funds to MAVIM (Amount)
			Y1	Y2	Y3	Y4	Y5						
1	Manpower & Other Exp.- to be funded to MAVIM-PIU	Contingencies	3.52	3.62	3.72			10.86	-				10.86

Chapter 10: Business Model

Assumptions

Particulars	Remarks
Average land holding in turmeric	1
Average production per acre (in MT) (current scenario)	7.5
Average production per acre (in MT) (post Leanagri Intervention)	10
Harvesting Loss (current scenario)	5%
Harvesting Loss (post leanagri intervention)	2%
Inflation	3%
Rate of Dry Rhisomes (per MT) (current scenario)	70,000
Rate of Dry Rhisomes (per MT)(post Leanagri Intervention)-current variety	72,000
Rate of Dry Rhisomes (per MT)(post Leanagri Intervention)- new variety	74,000

Custom Hiring Assumptions

Custom Hiring Machine	Available No. of days	No. of Hours Per day	Charges per day or Hour	Unit for charging rent
Turmeric Boiler	90	8	800	per hour
Turmeric Polisher	90	8	800	per hour
Tractor-55HP	100	8	500	per hour
Planter	70	7	800	per day
Harvester	70	7	500	per day

Depreciation

Particulars	SLM	WDV
Building & Civil Works	3.17%	10%
Machinery	6.33%	15%

Note: The cost of the interventions proposed is taken either as per the Gat Sheti Cost Norms or as per the quotations provided by the partners

CBO 1: Surya Farmer Producer Company Ltd.

Profitability Statement

Profit and loss Account for the Project					
Particulars	Y1	Y2	Y3	Y4	Y5
Revenue					
Commission charged from farmers	3.45	6.37	8.02	9.75	11.59
Custom Hiring	8.22	9.04	9.87	10.67	11.50
Recurring Grant from SMART / funds from MAVIM	14.46	18.06	16.98	9.48	5.88
Collection from farmers for improved se	3.84	3.84	1.92	1.92	1.92
Collection from farmers for GAP certifica	0.80	0.80	0.80	0.80	0.80
Total Revenue	**30.77**	**38.11**	**37.59**	**32.62**	**31.69**
Fixed Expenses					
Training & Workshops	1.80	1.80	1.80	0.00	0.00
Admin Exp	3.93	4.06	4.20	4.34	4.48
Total Fixed exp	**5.73**	**5.86**	**6.00**	**4.34**	**4.48**
Variable Expenses					
Custom Hiring	1.57	1.70	1.82	1.94	2.06
Soil Testing, Traceability	4.50	8.10	9.90	5.40	1.80
Seed Purchase	9.60	9.60	4.80	4.80	4.80
GAP Certificate Exp	2.00	2.00	2.00	2.00	2.00
Total Variable exp	**17.67**	**21.40**	**18.52**	**14.14**	**10.66**
Preliminary exp written off	0.07	0.07	0.07	0.07	0.07
Depreciation (SLM)	1.17	1.17	1.17	1.17	1.17
Profit Before interest and Tax	6.13	9.61	11.83	12.90	15.31
Term loan interest	0.43	0.35	0.25	0.15	0.05
Interest on WC	0.00	0.00	0.00	0.00	0.00
Profit Before Tax	5.70	9.26	11.58	12.74	15.25
Less. Tax	0.00	0.00	0.00	0.00	0.00
Profit After Tax	**5.70**	**9.26**	**11.58**	**12.74**	**15.25**

Cash-flow Statement

Cash Flow Statement						
Sr.	**Particulars**	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**
1	**Revenue**					
	Sales and Service Charges	30.77	38.11	37.59	32.62	31.69
2	**Term Loan**	3.70	-	-	-	-
	W. Capital Loan	-	-	-	-	-
3	**Equity/ Share capital**	21.29	-	-	-	-
4	**Grant**	11.32	-	-	-	-
5	**Increase in Current Liabilities**	1.95	0.32	(0.23)	(0.50)	(0.28)
	Sub Total (A)	**69.03**	**38.43**	**37.36**	**32.12**	**31.41**
	Cash Outflow (Rs.)					
1	**Capital Expenditure**					
a	Building and Civil Work	-	-	-	-	-
b	Plant and Machinary	18.50	-	-	-	-
c	Implementation related Costs	-	-	-	-	-
d	Vehicle	-	-	-	-	-
e	Pre Operative Exp	0.37	-	-	-	-
2	**Operational Expenditure**					
a	Fixed Cost (Excl. Of Interest)	5.73	5.86	6.00	4.34	4.48
b	Variable Cost	17.67	21.40	18.52	14.14	10.66
c	Cost of Material Consumed *(inc in variable cost)*					
3	**Loan Repayment**					
a	Repayment of Loan	0.41	0.82	0.82	0.82	0.82
b	Interest on TL	0.43	0.35	0.25	0.15	0.05
c	Interest on WC	-	-	-	-	-
4	**Increase in Debtors**	3.08	0.73	(0.05)	(0.50)	(0.09)
	Increase in Stock					
5	**Tax**	-	-	-	-	-
6	**Differencial tax liabilities**					
	Sub Total (B)	**46.19**	**29.17**	**25.54**	**18.96**	**15.92**
	Net Cash Flow (A-B)	**22.84**	**9.27**	**11.82**	**13.16**	**15.49**
	Opening Cash and Bank		22.84	32.11	43.93	57.09
	Cumulative Cash Balance	**22.84**	**32.11**	**43.93**	**57.09**	**72.58**

Loan Repayment Schedule

Repayment Schedule				
Loan	3.70			
Interest rate	12%			
Particulars	Opening Balance	Interest	Principal Repayment	Closing Outstanding
Year 1	3.70	0.43	0.41	3.29
Year 2	3.29	0.35	0.82	2.47
Year 3	2.47	0.25	0.82	1.64
Year 4	1.64	0.15	0.82	0.82
Year 5	0.82	0.05	0.82	0

Key Financial ratios

Sr. No.	Particulars	Ratio
1	NPV	15.54
2	Benefit Cost Ratio	1.54
3	IRR	15.09%
4	Project Payback Period	3 yrs. 6 months

CBO 2: Omkarnath Shetkari Gat

Profitability Statement

Profit and loss Account for the Project					
Particulars	Y1	Y2	Y3	Y4	Y5
Revenue					
Commission charged from farmers	0.69	2.13	3.68	5.31	7.03
Custom Hiring	8.86	9.74	10.63	11.51	12.40
Recurring Grant from SMART	5.54	7.34	9.14	6.24	4.44
Collection from farmers for improved s	0.96	0.96	0.96	0.96	0.96
Collection from farmers for GAP certifi	0.80	0.80	0.80	0.80	0.80
Total Revenue	**16.85**	**20.97**	**25.21**	**24.82**	**25.63**
Fixed Expenses					
Training & Workshops	1.20	1.20	1.20	0.00	0.00
Admin Exp	3.93	4.06	4.20	4.34	4.48
Total Fixed exp	**5.13**	**5.26**	**5.40**	**4.34**	**4.48**
Variable Expenses					
Custom Hiring	1.57	1.70	1.82	1.94	2.06
Soil Testing, Traceability	0.90	2.70	4.50	3.60	1.80
Seed Purchase	2.40	2.40	2.40	2.40	2.40
GAP Certificate Exp	2.00	2.00	2.00	2.00	2.00
Total Variable exp	**6.87**	**8.80**	**10.72**	**9.94**	**8.26**
Preliminary exp written off	0.07	0.07	0.07	0.07	0.07
Depreciation (SLM)	1.17	1.17	1.17	1.17	1.17
Profit Before interest and Tax	3.61	5.67	7.85	9.30	11.65
Term loan interest	0.43	0.35	0.25	0.15	0.05
Interest on WC	0.00	0.00	0.00	0.00	0.00
Profit Before Tax	3.18	5.32	7.60	9.14	11.59
Less. Tax	0.00	0.08	0.48	0.87	1.56
Profit After Tax	**3.18**	**5.24**	**7.11**	**8.28**	**10.04**

Cash Flow

Cash Flow Statement						
Sr.	**Particulars**	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**
1	**Revenue**					
	Sales and Service Charges	16.85	20.97	25.21	24.82	25.63
2	**Term Loan**	3.70	-	-	-	-
	W. Capital Loan	-	-	-	-	-
3	**Equity/ Share capital**	12.65	-	-	-	-
4	**Grant**	11.32	-	-	-	-
5	**Increase in Current Liabilities**	1.00	0.17	0.17	(0.15)	(0.13)
	Sub Total (A)	**45.52**	**21.14**	**25.38**	**24.67**	**25.50**
	Cash Outflow (Rs.)					
1	**Capital Expenditure**					
a	Building and Civil Work	-	-	-	-	-
b	Plant and Machinary	18.50	-	-	-	-
c	Implementation related Costs	-	-	-	-	-
d	Vehicle	-	-	-	-	-
e	Pre Operative Exp	0.37	-	-	-	-
2	**Operational Expenditure**					
a	Fixed Cost (Excl. Of Interest)	5.13	5.26	5.40	4.34	4.48
b	Variable Cost	6.87	8.80	10.72	9.94	8.26
c	Cost of Material Consumed *(inc in variable cost)*					
3	**Loan Repayment**					
a	Repayment of Loan	0.41	0.82	0.82	0.82	0.82
b	Interest on TL	0.43	0.35	0.25	0.15	0.05
c	Interest on WC	-	-	-	-	-
4	**Increase in Debtors**	1.69	0.41	0.42	(0.04)	0.08
	Increase in Stock					
5	**Tax**	-	0.08	0.48	0.87	1.56
6	**Differencial tax liabilities**					
	Sub Total (B)	**33.39**	**15.72**	**18.10**	**16.08**	**15.25**
	Net Cash Flow (A-B)	**12.12**	**5.42**	**7.28**	**8.59**	**10.25**
	Opening Cash and Bank		12.12	17.54	24.83	33.41
	Cumulative Cash Balance	**12.12**	**17.54**	**24.83**	**33.41**	**43.66**

Loan Repayment Schedule

Repayment Schedule				
Loan	**3.70**			
Interest rate	**12%**			
Particulars	**Opening Balance**	**Interest**	**Principal Repayment**	**Closing Outstanding**
Year 1	3.70	0.43	0.41	3.29
Year 2	3.29	0.35	0.82	2.47
Year 3	2.47	0.25	0.82	1.64
Year 4	1.64	0.15	0.82	0.82
Year 5	0.82	0.05	0.82	0

Key Financial ratios

Sr. No.	Particulars	Ratio
1	NPV	18.87
2	Benefit Cost Ratio	1.55
3	IRR	15.01%
4	Project Payback Period	3 yr 6 months

CBO 3: Pragati CMRC, Satara

Profitability Statement

Profit and loss Account for the Project					
Particulars	Y1	Y2	Y3	Y4	Y5
Revenue					
Commission charged from farmers	1.37	2.83	4.38	6.04	7.78
Custom Hiring	9.66	10.62	11.59	12.55	13.52
Recurring Grant from SMART / funds from MAVIM	11.40	13.30	13.76	6.24	4.44
Collection from farmers for improved s	1.92	1.92	0.96	0.96	0.96
Collection from farmers for GAP certifi	0.80	0.80	0.80	0.80	0.80
Total Revenue	**25.15**	**29.47**	**31.49**	**26.59**	**27.50**
Fixed Expenses					
Training & Workshops	1.20	1.20	1.20	0.00	0.00
Admin Exp	3.52	3.62	3.72	3.84	3.96
Total Fixed exp	**4.72**	**4.82**	**4.92**	**3.84**	**3.96**
Variable Expenses					
Custom Hiring	1.81	1.96	2.11	2.25	2.40
Soil Testing, Traceability	1.80	3.60	5.40	3.60	1.80
Seed Purchase	4.80	4.80	2.40	2.40	2.40
GAP Certificate Exp	2.00	2.00	2.00	2.00	2.00
Total Variable exp	**10.41**	**12.36**	**11.91**	**10.25**	**8.60**
Preliminary exp written off	0.11	0.11	0.11	0.11	0.11
Depreciation (SLM)	1.49	1.49	1.49	1.49	1.49
Profit Before interest and Tax	8.42	10.68	13.06	10.89	13.34
Term loan interest	0.67	0.54	0.39	0.23	0.08
Interest on WC	0.00	0.00	0.00	0.00	0.00
Profit Before Tax	7.75	10.14	12.67	10.66	13.26
Less. Tax	0.20	0.81	1.56	1.09	1.96
Profit After Tax	**7.55**	**9.34**	**11.12**	**9.57**	**11.30**

Cash Flow

Cash Flow Statement						
Sr.	**Particulars**	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**
1	**Revenue**					
	Sales and Service Charges	25.15	29.47	31.49	26.59	27.50
2	**Term Loan**	5.70	-	-	-	-
	W. Capital Loan	-	-	-	-	-
3	**Equity/ Share capital**	16.65	-	-	-	-
4	**Grant**	17.44	-	-	-	-
5	**Increase in Current Liabilities**	1.26	0.17	(0.03)	(0.23)	(0.13)
	Sub Total (A)	**66.20**	**29.64**	**31.46**	**26.36**	**27.37**
	Cash Outflow (Rs.)					
1	**Capital Expenditure**					
a	Building and Civil Work	10.00	-	-	-	-
b	Plant and Machinary	18.50	-	-	-	-
c	Implementation related Costs	-	-	-	-	-
d	Vehicle	-	-	-	-	-
e	Pre Operative Exp	0.57	-	-	-	-
2	**Operational Expenditure**					
a	Fixed Cost (Excl. Of Interest)	4.72	4.82	4.92	3.84	3.96
b	Variable Cost	10.41	12.36	11.91	10.25	8.60
c	Cost of Material Consumed *(inc in variable cost)*					
3	**Loan Repayment**					
a	Repayment of Loan	0.63	1.27	1.27	1.27	1.27
b	Interest on TL	0.67	0.54	0.39	0.23	0.08
c	Interest on WC	-	-	-	-	-
4	**Increase in Debtors**	2.52	0.43	0.20	(0.49)	0.09
	Increase in Stock					
5	**Tax**	0.20	0.81	1.56	1.09	1.96
6	**Differencial tax liabilities**					
	Sub Total (B)	**48.22**	**20.23**	**20.24**	**16.19**	**15.95**
	Net Cash Flow (A-B)	**17.98**	**9.41**	**11.22**	**10.17**	**11.42**
	Opening Cash and Bank		17.98	27.39	38.62	48.79
	Cumulative Cash Balance	**17.98**	**27.39**	**38.62**	**48.79**	**60.21**

Loan Repayment Schedule

Repayment Schedule				
Loan	**5.70**			
Interest rate	**12%**			
Particulars	**Opening Balance**	**Interest**	**Principal Repayment**	**Closing Outstanding**
Year 1	5.70	0.67	0.63	5.07
Year 2	5.07	0.54	1.27	3.80
Year 3	3.80	0.39	1.27	2.53
Year 4	2.53	0.22	1.27	1.27
Year 5	1.27	0.08	1.27	0

Key Financial ratios

Sr. No.	Particulars	Ratio
1	NPV	13.49
2	Benefit Cost Ratio	1.46
3	IRR	14.46%
4	Project Payback Period	3 yr 4 months

CBO 4: CMRC, Vasmat, Hingoli

Profitability Statement

Profit and loss Account for the Project					
Particulars	Y1	Y2	Y3	Y4	Y5
Revenue					
Commission charged from farmers	2.74	5.65	8.76	12.06	15.56
Custom Hiring	5.78	6.36	6.93	7.51	8.08
Recurring Grant from SMART / funds from MAVIM	16.58	20.28	21.10	11.28	7.68
Collection from farmers for improved s	3.84	3.84	1.92	1.92	1.92
Collection from farmers for GAP certifi	0.80	0.80	0.80	0.80	0.80
Total Revenue	**29.74**	**36.93**	**39.51**	**33.57**	**34.04**
Fixed Expenses					
Training & Workshops	1.50	1.50	1.50	0.00	0.00
Admin Exp	3.52	3.62	3.72	3.84	3.96
Total Fixed exp	**5.02**	**5.12**	**5.22**	**3.84**	**3.96**
Variable Expenses					
Custom Hiring	1.21	1.30	1.39	1.47	1.56
Soil Testing, Traceability	3.60	7.20	10.80	7.20	3.60
Seed Purchase	9.60	9.60	4.80	4.80	4.80
GAP Certificate Exp	2.00	2.00	2.00	2.00	2.00
Total Variable exp	**16.41**	**20.10**	**18.99**	**15.47**	**11.96**
Preliminary exp written off	0.11	0.11	0.11	0.11	0.11
Depreciation (SLM)	1.49	1.49	1.49	1.49	1.49
Profit Before interest and Tax	6.71	10.10	13.70	12.65	16.52
Term loan interest	0.67	0.54	0.39	0.23	0.08
Interest on WC	0.00	0.00	0.00	0.00	0.00
Profit Before Tax	6.04	9.56	13.31	12.42	16.44
Less. Tax	0.06	0.69	1.76	1.60	2.95
Profit After Tax	**5.98**	**8.88**	**11.56**	**10.82**	**13.49**

Cash Flow

Cash Flow Statement						
Sr.	**Particulars**	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**
1	**Revenue**					
	Sales and Service Charges	29.74	36.93	39.51	33.57	34.04
2	**Term Loan**	5.70	-	-	-	-
	W. Capital Loan	-	-	-	-	-
3	**Equity/ Share capital**	23.37	-	-	-	-
4	**Grant**	17.44	-	-	-	-
5	**Increase in Current Liabilities**	1.79	0.32	(0.08)	(0.41)	(0.28)
	Sub Total (A)	**78.04**	**37.25**	**39.43**	**33.16**	**33.76**
	Cash Outflow (Rs.)					
1	**Capital Expenditure**					
a	Building and Civil Work	10.00	-	-	-	-
b	Plant and Machinary	18.50	-	-	-	-
c	Implementation related Costs	-	-	-	-	-
d	Vehicle	-	-	-	-	-
e	Pre Operative Exp	0.57	-	-	-	-
2	**Operational Expenditure**					
a	Fixed Cost (Excl. Of Interest)	5.02	5.12	5.22	3.84	3.96
b	Variable Cost	16.41	20.10	18.99	15.47	11.96
c	Cost of Material Consumed *(inc in variable cost)*					
3	**Loan Repayment**					
a	Repayment of Loan	0.63	1.27	1.27	1.27	1.27
b	Interest on TL	0.67	0.54	0.39	0.23	0.08
c	Interest on WC	-	-	-	-	-
4	**Increase in Debtors**	2.97	0.72	0.26	(0.59)	0.05
	Increase in Stock					
5	**Tax**	0.06	0.69	1.76	1.60	2.95
6	**Differencial tax liabilities**					
	Sub Total (B)	**54.83**	**28.44**	**27.87**	**21.82**	**20.26**
	Net Cash Flow (A-B)	**23.20**	**8.81**	**11.55**	**11.35**	**13.50**
	Opening Cash and Bank		23.20	32.01	43.56	54.91
	Cumulative Cash Balance	**23.20**	**32.01**	**43.56**	**54.91**	**68.41**

Loan Repayment Schedule

Repayment Schedule				
Loan	**5.70**			
Interest rate	**12%**			
Particulars	**Opening Balance**	**Interest**	**Principal Repayment**	**Closing Outstanding**
Year 1	5.70	0.67	0.63	5.07
Year 2	5.07	0.54	1.27	3.80
Year 3	3.80	0.39	1.27	2.53
Year 4	2.53	0.23	1.27	1.27
Year 5	1.27	0.08	1.27	0

Key Financial ratios

Sr. No.	Particulars	Ratio
1	NPV	14.23
2	Benefit Cost Ratio	1.49
3	IRR	14.28%
4	Project Payback Period	3 Yr 5 months

CBO 5: Roshani CMRC, Javlabajar, Hingoli

Profitability Statement

Profit and loss Account for the Project					
Particulars	Y1	Y2	Y3	Y4	Y5
Revenue					
Commission charged from farmers	2.74	5.65	8.76	12.06	15.56
Custom Hiring	5.78	6.36	6.93	7.51	8.08
Recurring Grant from SMART / funds from MAVIM	16.58	20.28	21.10	11.28	7.68
Collection from farmers for improved s	3.84	3.84	1.92	1.92	1.92
Collection from farmers for GAP certifi	0.80	0.80	0.80	0.80	0.80
Total Revenue	**29.74**	**36.93**	**39.51**	**33.57**	**34.04**
Fixed Expenses					
Training & Workshops	1.50	1.50	1.50	0.00	0.00
Admin Exp	3.52	3.62	3.72	3.84	3.96
Total Fixed exp	**5.02**	**5.12**	**5.22**	**3.84**	**3.96**
Variable Expenses					
Custom Hiring	1.21	1.30	1.39	1.47	1.56
Soil Testing, Traceability	3.60	7.20	10.80	7.20	3.60
Seed Purchase	9.60	9.60	4.80	4.80	4.80
GAP Certificate Exp	2.00	2.00	2.00	2.00	2.00
Total Variable exp	**16.41**	**20.10**	**18.99**	**15.47**	**11.96**
Preliminary exp written off	0.11	0.11	0.11	0.11	0.11
Depreciation (SLM)	1.49	1.49	1.49	1.49	1.49
Profit Before interest and Tax	6.71	10.10	13.70	12.65	16.52
Term loan interest	0.67	0.54	0.39	0.23	0.08
Interest on WC	0.00	0.00	0.00	0.00	0.00
Profit Before Tax	6.04	9.56	13.31	12.42	16.44
Less. Tax	0.06	0.69	1.76	1.60	2.95
Profit After Tax	**5.98**	**8.88**	**11.56**	**10.82**	**13.49**

Cash Flow

Cash Flow Statement						
Sr.	**Particulars**	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**
1	**Revenue**					
	Sales and Service Charges	29.74	36.93	39.51	33.57	34.04
2	**Term Loan**	5.70	-	-	-	-
	W. Capital Loan	-	-	-	-	-
3	**Equity/ Share capital**	23.37	-	-	-	-
4	**Grant**	17.44	-	-	-	-
5	**Increase in Current Liabilities**	1.79	0.32	(0.08)	(0.41)	(0.28)
	Sub Total (A)	**78.04**	**37.25**	**39.43**	**33.16**	**33.76**
	Cash Outflow (Rs.)					
1	**Capital Expenditure**					
a	Building and Civil Work	10.00	-	-	-	-
b	Plant and Machinary	18.50	-	-	-	-
c	Implementation related Costs	-	-	-	-	-
d	Vehicle	-	-	-	-	-
e	Pre Operative Exp	0.57	-	-	-	-
2	**Operational Expenditure**					
a	Fixed Cost (Excl. Of Interest)	5.02	5.12	5.22	3.84	3.96
b	Variable Cost	16.41	20.10	18.99	15.47	11.96
c	Cost of Material Consumed *(inc in variable cost)*					
3	**Loan Repayment**					
a	Repayment of Loan	0.63	1.27	1.27	1.27	1.27
b	Interest on TL	0.67	0.54	0.39	0.23	0.08
c	Interest on WC	-	-	-	-	-
4	**Increase in Debtors**	2.97	0.72	0.26	(0.59)	0.05
	Increase in Stock					
5	**Tax**	0.06	0.69	1.76	1.60	2.95
6	**Differencial tax liabilities**					
	Sub Total (B)	**54.83**	**28.44**	**27.87**	**21.82**	**20.26**
	Net Cash Flow (A-B)	**23.20**	**8.81**	**11.55**	**11.35**	**13.50**
	Opening Cash and Bank		23.20	32.01	43.56	54.91
	Cumulative Cash Balance	**23.20**	**32.01**	**43.56**	**54.91**	**68.41**

Loan Repayment Schedule

Repayment Schedule				
Loan	**5.70**			
Interest rate	**12%**			
Particulars	**Opening Balance**	**Interest**	**Principal Repayment**	**Closing Outstanding**
Year 1	5.70	0.67	0.63	5.07
Year 2	5.07	0.54	1.27	3.80
Year 3	3.80	0.39	1.27	2.53
Year 4	2.53	0.23	1.27	1.27
Year 5	1.27	0.08	1.27	0

Key Financial ratios

Sr. No.	Particulars	Ratio
1	NPV	14.23
2	Benefit Cost Ratio	1.49
3	IRR	14.28%
4	Project Payback Period	3 Yr 5 months

Chapter 11: Financial Analysis and Results Framework

The project shall have the following economic impact

- Reduction in cost of inputs - Season-long schedule developed post analysis reduces the cost of inputs (nutrient management, pest and disease management) by 10-15% compared to previous season.
- Increment in the farm productivity- Following the scheduled activities with a compliance rate of 80% or higher results in increment in farm produce by 30-40% compared to previous season. LeanAgri works with prestigious national and international institutes like ICRISAT (International Crop Research Institute for Semi-Arid Tropics) and ICAR (Indian Council of Agriculture Research) for research and validations. Our trials with ICAR proved increase in quality produce yield by 38% w.r.t. ICAR based practices and 133% increase with respect to Maharashtra state based practices.
- Market availability for Turmeric based on Turmeric intrinsic value- The associated farmers will be directly linked to the industry valuing the turmeric by its intrinsic value of curcumin content. To address any fluctuations, the rates will have floor and ceiling rates with premium decided as per curcumin in the final produce.
- Faster transactions to the Farmers by the Market- Usual transfer of amounts in the existing market takes a month(minimum). The market linkage provided by LeanAgri aims to complete the transactional procedure within 2 weeks from the date of procurement of turmeric from farmer.
- The project shall provide direct employment to more than 80 people and indirect employment to more than 200 people

Detail of the benefit to the farmers

Below are the charts depicting the earning of the farmers in the current situation and the expected benefit after the intervention of LeanAgri.

Producer/Farmers:

Current Scenario	Y1	Y2	Y3	Y4	Y5
Average current productivity per acre (in MT)	7.50	7.50	7.50	7.50	7.50
Normal Loss on harvesting	5%	5%	5%	5%	5%
Available quantity for boiling	7.13	7.13	7.13	7.13	7.13
Output of dry Rhisomes post boiling and drying	20%	20%	20%	20%	20%

Qty of dry Rhisomes post boiling and drying	1.425	1.425	1.425	1.425	1.425
Rate of dry Rhisomes per MT	70,000	72,100	74,263	76,491	78,786
Total Revenue (In Rs.)	99,750	103,312	105,825	109,000	112,270

According data provided in above table, in Current Scenario Average productivity of turmeric per acre is 7.5 MT and normal loss on harvesting is 5% and output of dry Rhizomes is 20% of Net production. As per detailed analysis presented in the Table (i.e. in Current Scenario), it is observed that the producer approximately earns gross income of Rs.99750/- per acre per year and cost of cultivation and harvesting is Rs. 70000/- per acres per year. So net income for Turmeric producer in current scenario is Rs. 29750/- per acre.
After involvement of LeanAgri, income of the turmeric growers is expected increase

Scenario post introduction of LeanAgri in the system	Y1	Y2	Y3	Y4	Y5
Average productivity per acre (in MT)	10.00	10.00	10.00	10.00	10.00
Normal Loss on harvesting	2%	2%	2%	2%	2%
Available quantity for boiling	9.80	9.80	9.80	9.80	9.80
Output of dry Rhisomes post boiling and drying	20%	20%	20%	20%	20%
.Qty of dry Rhisomes post boiling and drying	1.96	1.96	1.96	1.96	1.96
Rate of dry Rhisomes per MT	72,000	72,100	74,263	76,491	78,786
Total Revenue	**141,120**	**141,316**	**145,555**	**149,922**	**154,421**

Productivity of producer will increase by nearly 30% after the intervention by LeanAgri. This intervention will also help to increase in quality of the produce due to proper guidance on pre-harvest and post-harvest activities carried out by the farmers. LeanAgri is also assuring a market for the produce. Hence it is expected that the farmers will get more realisation for the turmeric they have produced. As per detailed analysis presented in the above table, it is expected that the producer will approximately earn Rs. 141120/- per acre per year and cost of cultivation and harvesting will be reduced to Rs. 60,000/- per acre per year. So net income for Turmeric producer in proposed scenario is Rs. 81,120/- Acre.
Hence it is expected that due to this intervention the income of the farmers is going to be doubled (approx.).

Project Impact	Year 1	Year 2	Year 3	Year 4	Year 5
Total No. of Farmers (Associated with 5 CBOs)	800	1600	2300	3000	3700
Total Land Area	800	1600	2300	3000	3700
Quantity Produced (MT)	1,568.00	3,136.80	4,508.40	5879.00	7252.60
Expected Turmeric Procurement by LeanAgri (MT)	1000.00	2500.00	4500.00	5879.00	7252.60
Reduction in Cost of Production – Per Farmer (Post Intervention)	~15.0%				
Price Realisation – Farmer (Post Intervention)	~4.0%				
Expected Increase in Yield – Farmer (Post Intervention)	~33.0%				

Benefit per farmer	50400				
Cost per farmer	16105				
Benefit Cost Ratio per farmer	1 : 3.13				

Chapter 12: Results Framework

Results Framework Indicators for Productive Partnerships

The Development Objective specific to the subcomponent of Productive Partnerships is to "*develop a long-term, voluntary and commercial relationship that will help the participating partners to improve their competitiveness in terms of price, cost, productivity, quality, and sales volume.*" Monitoring and Evaluation (M&E) of relevant processes and interventions will help in achieving the said sub-component level development objective. Specific Results Framework Indicators will be tracked by the M&E team at pre-decided intervals for this purpose.

There are three entity level stakeholders in the Productive Partnerships sub-component. These are i) Buyer firm, ii) CBO(s), and iii) Farmers within the CBOs. Clearly, the outcome indicators will have to be defined vis-a-vis all three entities so that competitiveness of each of the stakeholders can be assessed correctly.

Table 12.1 gives the names of Indicators and connects the indicator to the exact outcome it will be able to track. Definitions of the indicators have been clearly delineated. The data sources from which the M&E team will collect the requisite information have also been quoted.

Table 12.1: Indicator, Definition, Related Outcome and Source

S No.	Indicator	Definition of Indicator	Outcome to be assessed through the Indicator	Source of Data
CBO level Indicators				
1	No. of farmer members in the CBO	No. of members in the CBO	Financial Sustainability/ Spillover of the intervention/ Tech adoption by non-project farmers	CBO
2	% membership of women farmers within total membership in the CBO	(No. of women members/ No. of total members) * 100	Gender mainstreaming	CBO
3	% Volume of Commodities sold by CBO to Buyer	(Procurement Volume by Buyer/ Total Volume sold by CBO)*100	Whether the supply chain has become more voluntary	MIS and/or CBO

S No.	Indicator	Definition of Indicator	Outcome to be assessed through the Indicator	Source of Data
4	Voluntary Expansion	No. of new buyers with whom the CBO transacted in that year	Voluntary nature of the activity. Commercial Sustainability. Long term viability.	CBO
Farmer level Indicators				
1	Productivity	Production (MT) per hectare	Competitiveness: Higher yields	Farmer Survey, NHB
2	Price Comparator Ratio	Average price given by CBO in 3 top procurement months/ Average price in closest APMC in same 3 months.	Competitiveness: Better prices and standardized quality. Commercial Sustainability. Long term viability.	CBO, APMC data
Buyer level Indicators				
1	Cost comparator Ratio	Procurement Cost per ton from CBO/ Procurement Cost per ton from all sources	Increased Competitiveness: Lower Costs due to presence of aggregator	Procurement Department of Buyer

While information on the indicators will be collected at concurrent intervals, tracking of the indicators will only be carried out at T0, (T+3) years and (T+6) years. Targets will be created for (T+3) years and (T+6) years in consultation with stakeholders.

Table 11.2: Template for tracking RF Indicators

S No.	Indicator	Y1	Y2	Y3	Target at Y3	Achieved/ Target	Y4	Y5	Target at Y5	Achieved/ Target
CBO level Indicators										
1	No. of farmer members in the CBO	800	1600	2300	2300		3000	3700	3700	
2	% membership of women farmers within total membership in the CBO									
3	% Volume of Commodities sold by CBO to Buyer									
4	Voluntary Expansion									
Farmer level Indicators										
1	Productivity									
2	Price Comparator Ratio									
Buyer level Indicators										
1	Cost comparator Ratio									

Chapter 13: Funds Flow Arrangement

Fund Flow for Surya FPCL

1) **Sub-project classification as per Fund Flow mechanism:** Type I (b)(i)
2) **Total Project Cost**
    a. Project grants + Beneficiary Contribution = 101.17 Lakhs
    b. Buyer Contribution = 19.80 Lakhs

    120.97 Lakhs
3) **Total Project Cost for financing is 120.97 Lakhs.**

(Rs.in lakhs)

Sr. No.	Particulars	Cost Associated	Grant Under SMART		Buyer Contribution		Beneficiary Contribution	
			%	Amount	%	Amount	%	Amount
1	2	3	4	5	6	7	8	9
1	Soft Interventions (capacity Building and Training)	9.00	100%	9.00	-	-	-	-
2	Traceability and Agronomy assistance	49.50	60%	29.70	40%	19.80	-	-
3	Improved Seeds & GAP Certification	43.60	60%	26.16	-	-	40%	17.44
4	Hard Interventions (Mechanization & Post-Harvest Facilities)	18.50	60%	11.10	-	-	40%	7.40

5	Preoperative Expenses	0.37	60%	0.22	-	-	40%	0.15
	Total	**120.97**		**76.18**		**19.80**		**24.99**

4) The grant amount will be deposited in a separate Escrow bank account opened for Productive Partnership proposal under SMART. The bank account will be named as "Name of the CBO-SMART A/c".

5) The table for fund flow of grants and beneficiary contribution

(Rs.in lakhs)

Sr. No.	**Particulars**	**% of Tranche w.r.t. EPC**	**Eligibility**	**Amount**	**Funding by whom**	**Implementation**
1	2	3	4	5	6	
1	Soft Interventions	100%		9.00	DIU/PCMU	DIU and CBO
2	1st tranche of Beneficiary contribution	20% of EPC		12.49	BC	CBO
3	1st Tranche of Project Grants	30% of EPC	After submitting proof of deposition of BC	33.59	PIU/PCMU	CBO
4	2nd tranche of Beneficiary contribution	12% of EPC		7.50	BC	CBO
5	Second tranche of Project Grant;	18% of EPC	To be released after spending of 70% of Rs. 46.08 lakhs (i.e. 2 +3 above), i.e. Rs. 32.25 lakhs	20.15	PIU/PCMU	CBO
6	Beneficiary Contribution plus share of Project Grants	BC=8% of EPC PG=12% of EPC	CBO have to carry out full Project and claim reimbursement of balance Project Share	18.44	BC	CBO

Sr. No.	Particulars	% of Tranche w.r.t. EPC	Eligibility	Amount	Funding by whom	Implementation
7	Final Tranche of Project Grant in the form of reimbursement	12% of EPC	Final Verification by Project	13.44	PIU/PCMU	DIU/PIU

6) Details of Buyer Contribution

(Amount in lakhs)

Sr.No.	Particulars	Amount	Funding	Implementation
1	Buyer Contribution towards testing, traceability and agronomy assistance is in the form of discount	19.80	100% by buyer	Buyer at CBO and farmers associated with CBO.

Note:

1. Eligible Project Cost for grant calculation is Total Project Cost minus Soft Intervention.
2. In the point no .3 above, in the Column no.6,"Funding by whom", as a stop gap arrangement funding will be at the PCMU level.

Fund Flow for Omkarnath Shetkari Gat

1) Sub-project classification as per Fund Flow mechanism: Type I (b)(i)

2) Total Project Cost

a. Project grants + Beneficiary Contribution = 60.37 Lakhs

b. Buyer Contribution = 9.00 Lakhs

69.37 Lakhs

3) Total Project Cost for financing is 69.37 Lakhs.

(Rs.in lakhs)

Sr. No.	Particulars	Cost Associated	Grant Under SMART		Buyer Contribution		Beneficiary Contribution	
			%	Amount	%	Amount	%	Amount
1	2	3	4	5	6	7	8	9
1	Soft Interventions (capacity Building and Training)	6.00	100%	6.00	-	-	-	-
2	Traceability and Agronomy assistance	22.50	60%	13.50	40%	9.00	-	-
3	Improved Seeds & GAP Certification	22.00	60%	13.20	-	-	40%	8.80
4	Hard Interventions (Mechanization & Post-Harvest Facilities)	18.50	60%	11.10	-	-	40%	7.40
5	Preoperative Expenses	0.37	60%	0.22	-	-	40%	0.15
	Total	**63.97**		**44.02**		**9.00**		**16.35**

4) The grant amount will be deposited in a separate Escrow bank account opened for Productive Partnership proposal under SMART. The bank account will be named as "Name of the CBO-SMART A/c".

5) The table for fund flow of grants and beneficiary contribution

(Rs.in lakhs)

Sr. No.	Particulars	% of Tranche w.r.t. EPC	Eligibility	Amount	Funding by whom	Implementation
1	2	3	4	5	6	
1	Soft Interventions	100%		6.00	DIU/PCMU	DIU and CBO
2	1st tranche of Beneficiary contribution	20% of EPC		8.18	BC	CBO
3	1st Tranche of Project Grants	30% of EPC	After submitting proof of	19.01	PIU/PCMU	CBO

Sr. No.	Particulars	% of Tranche w.r.t. EPC	Eligibility	Amount	Funding by whom	Implementation
			deposition of BC			
4	2nd tranche of Beneficiary contribution	12% of EPC		4.90	BC	CBO
5	Second tranche of Project Grant;	18% of EPC	To be released after spending of 70% of Rs. 27.19 lakhs (i.e. 2 +3 above), i.e. Rs. 19.03 lakhs	11.41	PIU/PCMU	CBO
6	Beneficiary Contribution plus share of Project Grants	BC=8% of EPC PG=12% of EPC	CBO have to carry out full Project and claim reimbursement of balance Project Share	10.87	BC	CBO
7	Final Tranche of Project Grant in the form of reimbursement	12% of EPC	Final Verification by Project	7.6	PIU/PCMU	DIU/PIU

6) Details of Buyer Contribution

(Amount in lakhs)

Sr.No.	Particulars	Amount	Funding	Implementation
1	Buyer Contribution towards testing, traceability and agronomy assistance is in the form of discount	9.00	100% by buyer	Buyer at CBO and farmers associated with CBO.

Note:

3. Eligible Project Cost for grant calculation is Total Project Cost minus Soft Intervention.

4. In the point no .3 above, in the Column no.6,"Funding by whom", as a stop gap arrangement funding will be at the PCMU level.

Fund Flow for Pragati CMRC, Satara

1) Sub-project classification as per Fund Flow mechanism: Type I (b)(i)

2) Total Project Cost

a. Project grants + Beneficiary Contribution = 78.07 Lakhs

b. Buyer Contribution = 10.80 Lakhs

88.87 Lakhs

3) Total Project Cost for financing is 88.87 Lakhs.

(Rs.in lakhs)

Sr. No.	Particulars	Cost Associated	Grant Under SMART		Buyer Contribution		Beneficiary Contribution	
			%	Amount	%	Amount	%	Amount
1	2	3	4	5	6	7	8	9
1	Soft Interventions (capacity Building and Training)	6.00	100%	6.00	-	-	-	-
2	Traceability and Agronomy assistance	27.00	60%	16.20	40%	10.80	-	-
3	Improved Seeds & GAP Certification	26.80	60%	16.08	-	-	40%	10.72
4	Hard Interventions (Mechanization & Post-Harvest Facilities)	28.50	60%	17.10	-	-	40%	11.40
5	Preoperative Expenses	0.57	60%	0.34	-	-	40%	0.23
	Total	**88.87**		**55.72**		**10.80**		**22.35**

4) The grant amount will be deposited in a separate Escrow bank account opened for Productive Partnership proposal under SMART. The bank account will be named as "Name of the CBO-SMART A/c".

5) The table for fund flow of grants and beneficiary contribution

(Rs.in lakhs)

Sr. No.	Particulars	% of Tranche w.r.t. EPC	Eligibility	Amount	Funding by whom	Implementation
1	2	3	4	5	6	
1	Soft Interventions	100%		6.00	DIU/PCMU	DIU and CBO
2	1st tranche of Beneficiary contribution	20% of EPC		11.18	BC	CBO
3	1st Tranche of Project Grants	30% of EPC	After submitting proof of deposition of BC	24.86	PIU/PCMU	CBO
4	2nd tranche of Beneficiary contribution	12% of EPC		6.70	BC	CBO
5	Second tranche of Project Grant;	18% of EPC	To be released after spending of 70% of Rs. 36.04 lakhs (i.e. 2 +3 above), i.e. Rs. 25.23 lakhs	14.92	PIU/PCMU	CBO
6	Beneficiary Contribution plus share of Project Grants	BC=8% of EPC PG=12% of EPC	CBO have to carry out full Project and claim reimbursement of balance Project Share	14.41	BC	CBO
7	Final Tranche of Project Grant in the form of reimbursement	12% of EPC	Final Verification by Project	9.94	PIU/PCMU	DIU/PIU

6) Details of Buyer Contribution

(Amount in lakhs)

Sr.No.	Particulars	Amount	Funding	Implementation
1	Buyer Contribution towards testing, traceability and agronomy assistance is in the form of discount	10.80	100% by buyer	Buyer at CBO and farmers associated with CBO.

Note:

5. Eligible Project Cost for grant calculation is Total Project Cost minus Soft Intervention.
6. In the point no .3 above, in the Column no.6,"Funding by whom", as a stop gap arrangement funding will be at the PCMU level.

Fund Flow for Vasmat CMRC, Vasmat

1) Sub-project classification as per Fund Flow mechanism: Type I (b)(i)

2) Total Project Cost

a. Project grants + Beneficiary Contribution = 112.57 Lakhs

b. Buyer Contribution = 21.60 Lakhs

134.17 Lakhs

3) Total Project Cost for financing is 134.17 Lakhs.

(Rs.in lakhs)

Sr. No.	Particulars	Cost Associated	Grant Under SMART		Buyer Contribution		Beneficiary Contribution	
			%	Amount	%	Amount	%	Amount
1	2	3	4	5	6	7	8	9
1	Soft Interventions (capacity Building and Training)	7.50	100%	7.50	-	-	-	-
2	Traceability and Agronomy assistance	54.00	60%	32.40	40%	21.60	-	-
3	Improved Seeds & GAP Certification	43.60	60%	26.16	-	-	40%	17.44
4	Hard Interventions (Mechanization & Post-Harvest Facilities)	28.50	60%	17.10	-	-	40%	11.40
5	Preoperative Expenses	0.57	60%	0.34	-	-	40%	0.23
	Total	**134.17**		**83.50**		**21.60**		**29.07**

4) The grant amount will be deposited in a separate Escrow bank account opened for Productive Partnership proposal under SMART. The bank account will be named as "Name of the CBO-SMART A/c".

5) The table for fund flow of grants and beneficiary contribution

(Rs.in lakhs)

Sr. No.	Particulars	% of Tranche w.r.t. EPC	Eligibility	Amount	Funding by whom	Implementation
1	2	3	4	5	6	
1	Soft Interventions	100%		7.50	DIU/PCMU	DIU and CBO
2	1st tranche of Beneficiary contribution	20% of EPC		14.54	BC	CBO
3	1st Tranche of Project Grants	30% of EPC	After submitting	38.00	PIU/PCMU	CBO

Sr. No.	Particulars	% of Tranche w.r.t. EPC	Eligibility	Amount	Funding by whom	Implementation
			proof of deposition of BC			
4	2nd tranche of Beneficiary contribution	12% of EPC		8.72	BC	CBO
5	Second tranche of Project Grant;	18% of EPC	To be released after spending of 70% of Rs. 52.54 lakhs (i.e. 2 +3 above), i.e. Rs. 36.78 lakhs	22.80	PIU/PCMU	CBO
6	Beneficiary Contribution plus share of Project Grants	BC=8% of EPC PG=12% of EPC	CBO have to carry out full Project and claim reimbursement of balance Project Share	5.81 15.20	BC	CBO
7	Final Tranche of Project Grant in the form of reimbursement	12% of EPC	Final Verification by Project	15.20	PIU/PCMU	DIU/PIU

6) Details of Buyer Contribution

(Amount in lakhs)

Sr.No.	Particulars	Amount	Funding	Implementation

1	Buyer Contribution towards testing, traceability and agronomy assistance is in the form of discount	21.60	100% by buyer	Buyer at CBO and farmers associated with CBO.

Note:

7. Eligible Project Cost for grant calculation is Total Project Cost minus Soft Intervention.

In the point no .3 above, in the Column no.6,"Funding by whom", as a stop gap arrangement funding will be at the PCMU level.

Fund Flow for Roshni CMRC, Javlabajar

1) **Sub-project classification as per Fund Flow mechanism:** Type I (b)(i)

2) **Total Project Cost**

a. Project grants + Beneficiary Contribution = 112.57 Lakhs

b. Buyer Contribution = 21.60 Lakhs

134.17 Lakhs

3) **Total Project Cost for financing is 134.17 Lakhs.**

(Rs.in lakhs)

Sr. No.	Particulars	Cost Associated	Grant Under SMART		Buyer Contribution		Beneficiary Contribution	
			%	Amount	%	Amount	%	Amount
1	2	3	4	5	6	7	8	9
1	Soft Interventions (capacity Building and Training)	7.50	100%	7.50	-	-	-	-

2	Traceability and Agronomy assistance	54.00	60%	32.40	40%	21.60	-	-
3	Improved Seeds & GAP Certification	43.60	60%	26.16	-	-	40%	17.44
4	Hard Interventions (Mechanization & Post-Harvest Facilities)	28.50	60%	17.10	-	-	40%	11.40
5	Preoperative Expenses	0.57	60%	0.34	-	-	40%	0.23
	Total	**134.17**		**83.50**		**21.60**		**29.07**

4) The grant amount will be deposited in a separate Escrow bank account opened for Productive Partnership proposal under SMART. The bank account will be named as "Name of the CBO-SMART A/c".

5) The table for fund flow of grants and beneficiary contribution

(Rs.in lakhs)

Sr. No.	**Particulars**	**% of Tranche w.r.t. EPC**	**Eligibility**	**Amount**	**Funding by whom**	**Implementation**
1	2	3	4	5	6	
1	Soft Interventions	100%		7.50	DIU/PCMU	DIU and CBO
2	1st tranche of Beneficiary contribution	20% of EPC		14.54	BC	CBO
3	1st Tranche of Project Grants	30% of EPC	After submitting proof of deposition of BC	38.00	PIU/PCMU	CBO
4	2nd tranche of Beneficiary contribution	12% of EPC		8.72	BC	CBO
5	Second tranche of Project Grant;	18% of EPC	To be released after spending of 70% of Rs. 52.54 lakhs	22.80	PIU/PCMU	CBO

Sr. No.	Particulars	% of Tranche w.r.t. EPC	Eligibility	Amount	Funding by whom	Implementation
			(i.e. 2 +3 above), i.e. Rs. 36.78 lakhs			
6	Beneficiary Contribution plus share of Project Grants	BC=8% of EPC PG=12% of EPC	CBO have to carry out full Project and claim reimbursement of balance Project Share	5.81 15.20	BC	CBO
7	Final Tranche of Project Grant in the form of reimbursement	12% of EPC	Final Verification by Project	15.20	PIU/PCMU	DIU/PIU

6) Details of Buyer Contribution

(Amount in lakhs)

Sr.No.	Particulars	Amount	Funding	Implementation
1	Buyer Contribution towards testing, traceability and agronomy assistance is in the form of discount	21.60	100% by buyer	Buyer at CBO and farmers associated with CBO.

Note:

8. Eligible Project Cost for grant calculation is Total Project Cost minus Soft Intervention.

In the point no .3 above, in the Column no.6,"Funding by whom", as a stop gap arrangement funding will be at the PCMU level.

Chapter 14: Procurement Plan

1	2	3	4	5	6	7	8	9	10	11	12	13	14
SL	Pkg. No	Description of Works/ Goods/ Non-Consulting Services	Estt. Cost. (Rs. Lakhs)	Estt. Cost. (Rs. Million)	Estt. Cost. (US$ Million)	Review by Bank (Prior / Post)	Method of Procurement	Estimate Preparation (Month/ Yr)	Preparation of Bid Document (Month/ Yr)	Bid Invitation (Month/ Yr)	Bid Open (Month/ Yr)	Contract Sign (Month/ Yr)	Comments
		Conversion Rate: 1 US$ =Rs. 70											
A	**GOODS**												
01	01	Lean Agri- CBO-1- All equipment's (planter, harvester, boiler, polisher, tractor)	18.5	1.8	0.025	Post	RFQ	Aug. 2019	Aug. 2019	Sept 2019	Sept 2019	Oct 2019	
02	02	Lean Agri- CBO-2- All equipment's (planter, harvester, boiler, polisher, tractor)	18.5	1.8	0.025	Post	RFQ	Aug. 2019	Aug. 2019	Sept 2019	Sept 2019	Oct 2019	
03	03	Lean Agri- CBO-3- All equipment's (planter, harvester, boiler, polisher, tractor)	18.5	1.8	0.025	Post	RFQ	Aug. 2019	Aug. 2019	Sept 2019	Sept 2019	Oct 2019	
04	04	Lean Agri- CBO-4- All equipment's (planter, harvester, boiler, polisher, tractor)	18.5	1.8	0.025	Post	RFQ	Aug. 2019	Aug. 2019	Sept 2019	Sept 2019	Oct 2019	
05	05	Lean Agri- CBO-5- All equipment's (planter, harvester, boiler, polisher, tractor)	18.5	1.8	0.025	Post	RFQ	Aug. 2019	Aug. 2019	Sept 2019	Sept 2019	Oct 2019	
B	**Civil Works**												
01	01	Lean Agri- CBO-3- Collection Centre	10	1.0	0.014	Post	RFQ	Aug. 2019	Aug. 2019	Sept 2019	Sept 2019	Oct 2019	
02	02	Lean Agri- CBO-4- Collection Centre	10	1.0	0.014	Post	RFQ	Aug. 2019	Aug. 2019	Sept 2019	Sept 2019	Oct 2019	
03	03	Lean Agri- CBO-5- Collection Centre	10	1.0	0.014	Post	RFQ	Aug. 2019	Aug. 2019	Sept 2019	Sept 2019	Oct 2019	

Chapter 15: Environment and Social Safeguards

Environmental Safeguards for the "LeanAgri" Productive Partnership Proposal

In the context of the World Bank assisted SMART Project, **Environment Safeguards** are the essential guidelines governed by the Govt. of India's and Govt. of Maharashtra's Environmental Laws & Policies and World Bank's Environmental Operational Policies. Its objective is to prevent and mitigate undue harm to people, biodiversity and natural ecosystems during the SMART project's or sub-project's design and implementation process.

As per the Environmental and Social Management Framework (E&SMF) report of the SMART Project, World Bank's Operational Guidelines and Policies, viz., Environment Assessment (OP/BP/GP/4.01), Performance Standards for Private Sector Activities (OP 4.03), and Pest Management (OP 4.09) are triggered for the "LeanAgri" Productive Partnership. The SMART project is classified as "Category B" in which its potential adverse environmental impacts on human populations and ecosystems are mostly less adverse & more limited, fewer, site-specific, likely reversible. It could be prevented, minimized, mitigated, or compensated to improve the environmental performance. To manage and mitigate this, an Environmental Management Framework (EMF) has been developed as a part of the ESMF report. EMF defines specific measures and processes which needs to be followed during the SMART project's design and implementation to effectively manage environmental risks and enhance positive impacts. In this relation, Pest & Pesticide Management Plan, Construction Management Guidelines for the Civil Works, Guidance Note on Biosafety/Quarantine requirements of the Founder Quality Seed Import to India for Propagation and Good Industry Practices for the Enterprises & Slaughter Houses has been developed and presented separately in the SMART's ESMF report.

Aligned with the recommendations of the ESMF report, "LeanAgri" is required to follow the principles of environment & biodiversity protection, foster aspects of food safety (MRL compliance), resource use efficiency, promotion of GAP practices, greenhouse gases emission reduction, agricultural pollution abatement, sustainability, and climate smart development. In this connection, during the PP designing, modification and implementation; it would be the responsibility of the concerned PP partners to have consultation with Environmental Safeguard Specialist of the SMART, refer to the EMF of the ESMF report and ensure its adherence. To improve stakeholder engagement and environmental stewardship, Environment Safeguard Specialist of the SMART PMU would be conducting/facilitating organization of workshops on the EMF for the SMART Project's CBOs, Officers of the State Line Departments and Enterprises.

For ensuring compliance to EMF during the PP's on-field implementation, need based field monitoring by the SMART PMU/PIU/DIU officers and third party agencies would be done. IEC material on Environmental Safeguards for the SMART Project would be provided to the PP partners for generating awareness related to the adoption and promotion of sustainable agri-value chain practices.

"LeanAgri" Productive Partnership Component Specific Environmental Safeguards Requirements are mentioned below:

Project Components	Component Interventions as per FPP	Anticipated Environmental Risk Category*	Environmental Safeguards Suggested
Capacity Building	Use of better practices and its promotion through lead farmers of the CBO	D	Capacity building of CBOs needs to have modules on Manuring and Fertilizer Application- FYM or compost @ 30-40 t/ha and oil cakes @ 2 t/ha.
Quality Production	Technical assistance involving soil testing , traceability, variety (Pratibha), GAP certifications to the farmers	D	Within quality production, additional assistance with respect to using green leaves at 12-15 t/ha as a Mulch may be promoted. It may be repeated at 7.5 t/ha at 40 and 90 days after planting. This would conserve soil moisture and increase soil organic carbon content.
Planter	To be provided on rental basis at a cost lower than market.	C	Planter should be used in a manner so as to minimize its impacts on soil fauna, viz., Earthworms, Annelids, etc. which helps in recycling of soil nutrients.
Harvester	To harvest the turmeric faster than the manual labour at a lower cost	C	The fuel (diesel) to be used in the Harvester should preferably be of low sulphur content 50 ppm (BS IV; Nationwide) and above standards
Boiler	The CBO would provide a movable boiler for turmeric boiling directly at the field reducing the transport cost and ensuring proper boiling time	B	The improved steam boiler for turmeric consisting of a trough, inner perforated drums and lid should be used (TNAU model). The source of water to be used for boiling turmeric rhizome should preferably from approved piped water connection. The boiled used water should be cooled to the ambient temperature and should be reused. Rather than using agricultural waste materials mostly turmeric leaves and and wood, the furnace may be fired with low emission and high calorific value refuse derived fuel.
Polisher	A polisher shall be provided by CBO for turmeric to remove the foreign material from the turmeric crop	C	The fuel (diesel) to be used in the Harvester should preferably be of low Sulphur content 50 ppm (BS IV; Nationwide) and above standards.
Tractor	Tractor shall be provided on rent by CBO to transport farm produce.	B	The tractors to be procured preferably be BS (CEV/Trem) IV and V standards compliant- The regulation for diesel

			powered non-road equipment including agricultural tractors.
Collection center	This infrastructure will be used by CBO for multiple purpose including collection point and temporary storage purpose.	B	All the interventions related to the Civil Works should follow the Construction Management Guideline's detailed out in the SMART's ESMF report.

***Please Note:**

Sr. No.	Environmental Risk Category	Risk Type	Description
1.	A	High	Significant adverse impacts that are sensitive, diverse, or unprecedented. Needs comprehensive Environment Assessment to fully understand the diverse and complex environmental risks and to identify, evaluate and suggest potential mitigation measures in the EMP.
2.	B	Moderately High	Compared to A, Potential impacts are less adverse & more limited, fewer, site-specific, likely reversible. Environmental assessment needs to evaluate a limited range of straightforward risks and to guide the implementation of well-established mitigation measures.
3.	C	Low	Expected to have no or minimal adverse environmental impacts which could be fully mitigated through routine measures.
4.	D	No Risk with Positive Impacts	Interventions having positive impacts. No environmental review and monitoring is required.

Social Safeguard

CBO Information:

1: Social Inclusion:

In the Partnership Plan, total 5 CBOs are involved out of which 3 are women-led CBOs i.e. Community Managed Resource Centre promoted by MAVIM, one is Farmer Producer Organization promoted by Maharashtra Agricultural Competitiveness Project and one is farmer group.

a.. **Land holding & Sex disaggregated details**: The membership details of the CBOs with respect to land holding and sex disaggregation at present are given in Table No 1 as below;

Table 1-Land holding and sex disaggregated membership details of CBOs

Sr. No	Name of the CBO	Total members of CBOs			Land holding details of members			
		Total	M	F	S & M F (0-2 Ha)	Medium F (2-4 Ha)	Big F (Above 4 Ha)	Landless
1	Roshani CMRC	3169	0	3169	814	1150	245	960
2	Vasamat CMRC	3012	0	3012	969	836	190	1017
3	Pragati CMRC	4209	0	4209	1513	1526	212	958
4	Surya FPO	538	401	137	218	204	93	23
5	Omkar Farmer Group	53	46	07	45	06	02	00
Total		**10981**	**447**	**10534**	**3559**	**3722**	**742**	**2958**

Source: Information from CBOs

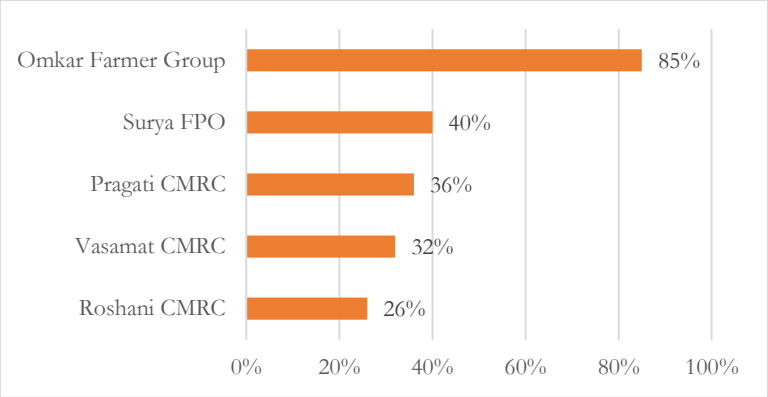


Figure 1: CBO wise data of small & marginal farmers

From Table 1, it is inferred that out of total 10981 members, **96%** (10534) are female members and **4%** (447) are male members. CMRCs constitute **95%** members of total members.**1%** female members are from Surya FPO and Omkar Farmer Group. Surya FPO has **25%** (137) female members out of their total membership whereas Omkar Farmer group has **13%** (7) female members.
The **32%** (3559), of the members represent the small and marginal category of land holding, where as **34%** **(**3722) & **7 %** (742) falling in medium and big category respectively. For CBO wise details of small and marginal farmers please refer Fig 1.

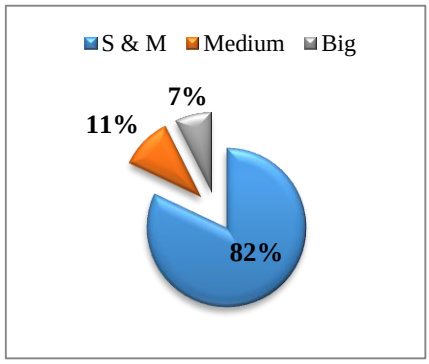


Figure 2: Women Land Ownership

b. Women land ownership: Out of total members, only **6%** (662) women have the legal ownership of farmland. The majority of women i.e. **82%** (543) belong to small and marginal category. Pl see Fig 2.
150 female members of Roshani CMRC have the legal land ownership and all belongs to small and marginal category. In Vasamat CMRC, out of 160 women, 50% (80) are from small and marginal category. In Pragati CMRC 100% (223) belongs to small and marginal category. In Surya FPO 67% (84) are in small and marginal category and in Omkar shetkari group 86% (06) are in small and marginal category.

c. **Social Category details**: The social category details of the CBO members are mentioned in Table No.2 as below;

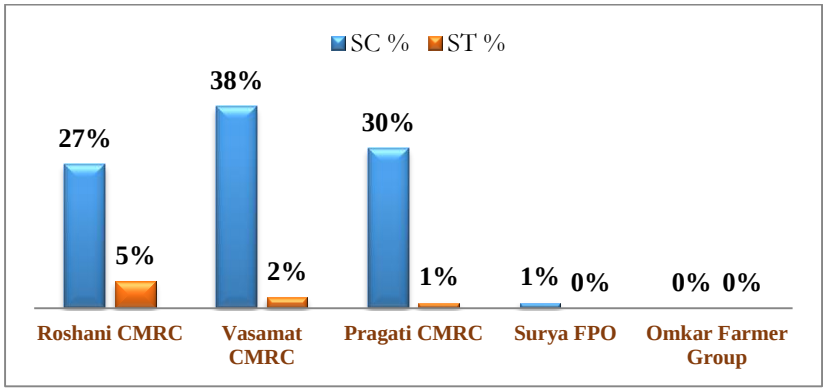
Table No.2-Social Category details of CBOs

Name of the CBO	Total members of CBOs	Social Category				
		SC	ST	NT	OBC	Open
Roshani CMRC	3169	867	153	285	454	1410
Vasamat CMRC	3012	1131	61	19	292	1509
Pragati CMRC	4209	1267	43	348	769	1782
Surya FPO	538	5	0	0	105	428
Omkar Farmer Group	53	0	0	0	5	48
	10981	3270	257	652	1625	5177

Source: Information from CBO

Table No. 2 depicts that out of total members, **30%** (3270) are scheduled caste, **2%** (257) are schedule tribes, **6%** (652) are nomadic tribes, and **15%** (1652) are other backward classes. In Omkar farmer group, there are no members from schedule caste or schedule tribes. Surya FPO has 1% (5) schedule caste members and no schedule tribe members. The CBO wise percentage of Schedule Caste and Tribe members is mentioned in Fig 3

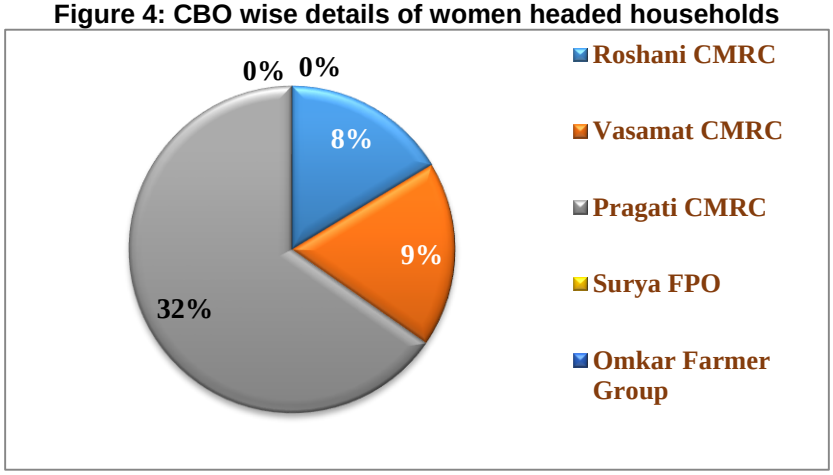
Figure 3: CBO wise details of Scheduled Caste & Scheduled Tribe member



d. Women-Headed Households:

Out of 10981 members**, 17% (**1870) are women headed households. Pragati CMRC represents significant number of women headed households i.e. **32%.** Please refer Fig 4.

Figure 4: CBO wise details of women headed households



Source: Information from CBO

e. Board of Director Details:

Table No.3: Details of Board of Directors

Name of CBO	Total No of Directors			Women on signatory positions	Social Category				
	M	F	Total		SC	ST	NT	OBC	Other
Roshani CMRC	0	9	9	3	8	0	0	1	0
Vasamat CMRC	0	11	11	3	8	0	0	0	3
Pragati CMRC	0	11	11	3	6			1	4
Surya FPO	05	0	05	0	0	0	0	0	5
Omkar Farmer Group	02	0	02	0	0	0	0	0	2
Total	07	31	38	9	22	0	0	2	14

Source: Information from CBO

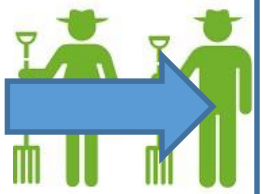
From Table No.3, it is inferred that there are no women directors in the Surya FPO and Omkar Farmer Group. Also, these two CBOs don't have Scheduled Caste/ Scheduled Tribe directors. Roshani CMRC has 89 % (8) board of directors from Scheduled Caste category followed by 73% & 55% by Vasamat & Pragati CMRC respectively. No CBO has representation from Scheduled Tribe.

2. Gender Analysis: On the basis of focused group discussions with male and female farmers, it is learnt that women are significantly involved in the production phase like sowing/planting, fertilizer application, weeding, and harvesting. Also, in post-harvest activities like boiling and drying, women play a noticeable role. In all these activities women are involved as paid labor or unpaid labor in the household farm. Women are considerably involved in the production activities but they don't have access to extension services and technology on better agricultural practices which may have direct impact on the productivity.

Secondly women play negligible role in decision making on selection of seeds, fertilizers, pesticides. The primary reason behind this is as women don't have access to extension services they have limited knowledge in this regard. Second reason is that patriarchal mind set of men and women restricts women's involvement in decision making. In marketing of turmeric, women play a limited role as the market is male dominated. Traditionally women are not involved in the aggregation of turmeric produce and marketing, and

hence they have less exposure and limited skills for marketing. Some women of Self Help Groups are involved in secondary processing and sell the turmeric powder through SHG exhibitions with limited volume.

Gender Gap: **Women** **Men**



Lack of Access to information and technology, Limited knowledge of Good Agricultural Practices, Less Exposure to Market, Limited Skills of Marketing, Lack of sufficient produce for marketing, Lack of adequate fund for asset creation, lack of assured market

Lack of adequate fund for asset creation, Lack of assured market-for curcumin based turmeric

Opportunity:

-United in CBOs
-Networking of members for aggregation of marketable produce
-Credit from SHG/CMRC
Increased bargaining power
-Institutional arrangement supports for sustainability

United in CBOs
Networking of members for aggregation of marketable produce
-Increased bargaining power
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B. Proposed Intervention in the Project

In the first year, the CBOs will work with the male and female members as below;

Name of CBO	Total members of CBO	Members involvement in 1st year of the project		
		M	F	Total
Roshani CMRC	3169	0	191	191
Vasamat CMRC	3012	0	201	201
Pragati CMRC	4209	0	100	100
Surya FPO	538			255
Omkar Farmer Group	53			53
Total				800

On the basis of CBO information, gender analysis, social inclusion guideline, social management framework and gender strategy of the project, the social safeguard plan is prepared and mentioned as below;

1. Social Inclusion:

Activity	Outcome	Indicator	Targets for CBOs to be achieved by third			
			Roshani CMRC	Vasamat CMRC	Pragati CMRC	Surya FPO
A. Social Inclusion	Increased participation of disadvantaged people in Productive Partnership					
1. Participation of small and marginal Farmers		% of small & marginal farmers benefited	Minimum 60% of total member	Minimum 60% of total member	Minimum 60% of total member	Minimum 50% of total member
2. Participation of Scheduled Tribes		% of ST members benefited	Negligible population witnessed in the CBO data i.e. 2 the land less category			
3. Participation of Scheduled Caste		% of SC members benefited	Minimum10% of total member	Minimum 10% of total members	Minimum 10% of total members	Minimum 5% of total members
4. Participation of women		% of women member benefited	-	-	-	Minimum 33% of total member
5. Participation of women headed HH/Single women		% of women headed households benefited	70% of total WHH of CBO -provided of having land or will be engaged in labor work	70% of total WHH of CBO - provided of having land or will be engaged in labor work	70% of total WHH of CBO - provided of having land or will be engaged in labor work	-

2. Social Safeguard:

I. World Bank Operational Policy:

Activity	Description	Targets for CBOs				
		Roshani CMRC	Vasamat CMRC	Pragati CMRC	Surya FPO	Omkar Farmer Group
1. 4.10 Indigenous people	The operational blocks of the CBOs are not tribal block. Hence this OP is not triggered. In overall CBO membership, 2% representation is from ST category	×	×	×	×	×

	and belongs to landless category					
2. 4.12 Involuntary resettlement	Construction of Collection center for Roshani, Vasamat and Pragati CMRC but there will not be involuntary resettlement and hence the OP is not triggered	For construction of Collection center , the land of clear title will be leased by the CBO	For construction of Collection center , the land of clear title will be leased by the CBO	For construction of Collection center , the land of clear title will be leased by the CBO	×	×

II. Other Social Safeguard:

Activity	Description	Risk Mitigation
1. 96% are women members	Traditionally women are not involved in aggregation and marketing. Here they are working in non-stereotype role and hence failure of which may lead them to fall in distress	Proposal is financially sound and viable. Capacity building of CBOs of in the area of quality production, aggregation & marketing will be done.
2. Child Labor	Children specifically work in the farm for fertilizer application and harvesting which hinders their education	CBO will take awareness campaign to prevent child labor
3. Equal wages for same work for male and female labor	There is gender discrimination in wages at farm level, primary processing and secondary processing	CBO will take awareness campaign for equal wages for male and female labor

3. Gender Integration Plan:

Activity	Outcome	Indicator	Target for CBO				
			Roshani CMRC	Vasamat CMRC	Pragati CMRC	Surya FPO	Omkar Farmer Group
I. Soil Testing	Increased adoption of better agricultural practices by women	Percentage of men did the soil testing Percentage of women did the soil testing	100% women member	100% women member	100% women member	33% women member	33% women member
II Production	Increased access of women to inputs						
Use of Improved seeds		- Percentage of women used improved seeds - Percentage of men used improved seeds	100% women member	100% women member	100% women member	33% women member	33% women member
Use of Quality inputs(bio fertilizer & bio pesticides)		- Percentage of women used quality inputs - Percentage of men used quality inputs	100% women member	100% women member	100% women member	33% women member	33% women member
II. GAP certification	Increased percentage in adoption of GAP by women	- Percentage of men received GAP certification - Percentage of women received	100% women member	100% women member	100% women member	33% women member	33% women member

Activity	Outcome	Indicator	Target for CBO				
			Roshani CMRC	Vasamat CMRC	Pragati CMRC	Surya FPO	Omkar Farmer Group
		GAP certification					
III. Capacity Building & Workshop	Increased capacity of women to perform effectively in value chain	Percentage of men member trained Percentage of women member trained	100% women member	100% women member	100% women member	33% women member	33% women member
IV. Decision Making	Increased participation of women in decision making						
1. Inclusion of women on board of director		% of women on board of director of FPO and Farmer Group	100%	100%	100%	30% women member	30% women member
2. Inclusion of women as Signatory Authority on board of director		-No of CMRCs changed the leadership -% of women as signatory authority on FPO & Farmer Group	Change in leadership	Change in leadership	Change in leadership	At least One women as signatory authority	At least one women as signatory
3. Inclusion of women in Custom Hiring Centre Committee			100% women	100% women	100% women	30% women involvement in custom hiring committee	30% women involvement in custom hiring committee
IV. Custom Hiring Services	Increased access to implements by women members	- Percentage of men benefited by CHC - Percentage of women	100% women	100% women	100% women	33% women member	33% women member

Activity	Outcome	Indicator	Target for CBO				
			Roshani CMRC	Vasamat CMRC	Pragati CMRC	Surya FPO	Omkar Farmer Group
		benefited by CHC					
VI. Gender Awareness	Increased gender awareness among board of directors						
1. Gender sensitization workshop for Board of directors		No of male member trained No of female member trained	100%	100%	100%	100%	100%
VII. Program Management of CBO	Increased enabling environment for women to participate in the project						
1. Employment generation-	Employment generation for women at CBO office under SMAART	% of men appointed % of women appointed	100% women appointed	100% women appointed	100% women appointed	30% women appointed	30% women appointed
2. Establishment of internal committee for sexual harassment at workplace	Decrease in sexual harassment at workplace	No of CBOs formed the committee	√	√	√	√	√
3. Provision of separate wash rooms for women at CBO office	Enabling environment for women created	No of CBOs with such facility	√	√	√	√	√

The achievement will be linked to 2nd and 3rd financial tranche. After fulfillment of the social inclusion plan, social safeguard plan and gender integration plan the 2nd and 3rd tranche will be released,

Prathibha (Turmeric)

Prathibha (Turmeric)

Year of Release	1996
Pedigree	Open pollinated progency selection
Areas of Adoption	All over India.
Crop Duration	225 days
Yield	39.12 tonnes of fresh rhizomes/ha

Quality Attribute

Curcumin	6.52%
Oleoresin	16.2%
Essential oil	6.2%

Morphological Characters

Colour of aerial shoot	Green
Plant height (cm)	42.9
Leaf length/breadth (cm)	53.3/16.7
No. of tillers per clump	1.6
No. of leaves per tiller	12.5
No. of mother rhizomes	1.3
No. of primaries	8.67
Colour of rhizome core	Reddish yellow
Dry recovery %	18.5
Colour of scale	Reddish brown

Special characteristics

Plumpy and bold rhizomes with fibre content. Resistant to root knot nematode.

ICAR, Kozhikode
http://www.spices.res.in/pages/prathibha-turmeric

Research Papers on Pratibha turmeric variety

1. Pratibha Variety - Curcumin extraction, a research paper by MAU Parbhani
2. Yield comparison of major turmeric varieties in India
3. IISR Pratibha - Good for a variety of environmental conditions and one of the few stable varieties for direct breeding by farmers.