





## Concurrent Monitoring Report- Round VI, April- Sept, 2022

## Monitoring & Evaluation (M&E) for Project on Climate Resilient Agriculture (PoCRA) in rest of Project Area Maharashtra

Nanaji Deshmukh Krushi Sanjeevani Prakalp

(Project of Government of Maharashtra in Partnership with the World Bank)





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## LIST OF ABBREVIATIONS

АА	Agriculture Assistant
ABPS	Aadhaar Based Payment System
АРМС	Agricultural Produce Market Committee
АРҮ	Area, Production, Yield
АТМА	Agricultural Technology Management Agency
BBF	Broad Bed Furrow
CAPI	Computer Assisted Personal Interviewing
CoC	Cost of Cultivation
CCT	Continuous Contour Trenches
СНС	Custom Hiring Centers
СМ	Concurrent Monitoring
DBT	Direct Benefit Transfer
DPMU	District Project Management Unit
DSAO	District Superintendent Agriculture Officer
DoA	Department of Agriculture
FGDs	Focus Group Discussions
GoM	Government of Maharashtra
GSVA	Gross State Value Added
FIG	Farmers Interest Group
FFS	Farmers' Field School
FPC	Farmer Producer Company
FPO	Farmer Producer Organization
IPM	Integrated Pest Management
К	Kharpan
KIIs	Key Informant Interviews

I



KVK	Krushi Vigyan Kendra
MLP	Micro-Level Planning
MIS	Management Information system
M&E	Monitoring & Evaluation
NABCONS	NABARD Consultancy Services P Ltd.
PDO	Project Development Objective
PMU	Project Management Unit
PoCRA	Project on Climate Resilient Agriculture
RFID	Results Framework Indicators
SC	Schedule Caste
ST	Schedule Tribe
SDAO	Sub-divisional Agriculture Officer
SHG	Self Help Group
SME	Small & Medium Enterprises
S&WC	Soil & Water Conservation Structures
SWOC	Strengths, Weaknesses, Opportunities & Challenges
ΤΑΟ	Taluka Agriculture Officer
ToR	Terms of Reference
VCRMC	Village Climate Resilient Management Committee
WB	World Bank



## Executive Summary

#### **Concurrent Monitoring**

The Concurrent Monitoring focuses on the systematic and continuous collection and analysis of data for measuring the process and progress of the project. A total of 10 concurrent monitoring rounds are planned and are being conducted during the 5-year project period, once every six months. So far, four rounds are completed and the report submitted to PMU. This report presents the results from the fifth round.

#### II. Sampling Methodology

Concurrent Monitoring (CM-VI) was conducted on a sample of 32 Project and 16 Control clusters, totalling 48 clusters per round. From each selected cluster, one village was selected for the survey.

For the selected project villages, a list of individual beneficiaries, community beneficiaries, farmer field school participants, and FPC & SHGs was obtained from the PMU. The corresponding list for the control villages was obtained by the field team by visiting the villages and enquiring with concerned officials or from their records. The sample coverage of beneficiaries in Project villages was like this: 64 samples from DBT-Pre-sanction, 143 from DBT-Subsidy released, 96 Guest farmers, 32 Host farmers, 50 beneficiaries of NRM/ Community Farm Pond, 32 SHG and 63 FPC members, totalling 480 interviews. The sample coverage for control area was 32 pre-sanction beneficiaries, 72 subsidy received beneficiaries, 48 guest farmers, 16 host farmers, 25 NRM beneficiaries, 16 SHG members and 33 FPC members, totalling 242 interviews.

In addition, Key Informant Interviews (KIIs) were conducted (with Krushi Tai, Agriculture and Cluster Assistants, and other senior government officials from the Department of Agriculture) in project villages to elicit responses from persons with informed perspectives. The information obtained from the key informants was the qualitative information required for the process and progress monitoring for concurrent surveys.

#### **Component A: Promoting Climate Resilient Agriculture Systems**

#### A1: Awareness on Participatory Project & Micro Planning

Micro-Planning Process is the foundation of the project and is an important component that supports the community in planning the adoption strategy at the village level. It was recorded in the CM-VI survey that 60% of the surveyed beneficiaries acknowledged that they were aware of it. This was similar to the results from the last CM round. With regard to satisfaction



with its implementation, 56.8% of respondents indicated that they were satisfied with the micro-planning of their village. However, about 28% of respondents rated the micro plan as "Un-satisfactory". It may be necessary to evaluate the reasons for dissatisfaction and identify areas for improvement in the process. About 43.6% answered that they or their family members were involved in the development of the micro-plans. Similarly, on water budgeting, 39.8% replied that they were aware of the water budgeting process conducted in their village. It was recorded that 74.35% of respondents were satisfied with the process for accessing project benefits, giving a positive signal to the growth and progress of the Project in RoPA.

#### Awareness of Representation of VCRMC Members

Out of the total 417 respondents (excluding 63 FPC members for whom this section was made not applicable), 246 (59.0%) indicated that they believed the VCRMC committee members represented all sections of society in their village and 51 (12.2%) respondents answered that they did not believe the committee members represented all sections of society in their village, while 120 (28.8%) respondents were either unsure or did not have enough information to form an opinion.

Overall, it can be interpreted that a majority of the respondents believed that the VCRMC committee members represented all sections of society in their village. However, a significant proportion of respondents were unsure or did not have enough information to form an opinion, and a smaller proportion did not believe that the committee members represented all sections of society.

Out of the total respondents, 308 (73.9%) indicated that they were very satisfied with the work of VCRMC, while only 80 (19.2%) were not satisfied with VCRMC. The remaining 12 (2.9%) respondents were neutral, while 17 (4.1%) were not involved in the survey.

#### Awareness of Social Media Sites of the PoCRA Project

Out of 417 respondents, 153 (36.7%) added that they were aware of the Social Media sites of PoCRA and had visited the Youtube channel and Facebook page of the PoCRA project; while 264 (63.3%) respondents answered negatively. This suggested that a relatively small percentage of the respondents were media savvy or had access to smart phone/ computer etc.



#### Satisfaction with the performance of Krushi Tai

Out of the 417 respondents, 69.3% of respondents rated Krushi Tai's work performance and support as "Satisfactory," while 17.5% of them rated it as "Un-Satisfied". Overall, it can be concluded that a major proportion of the respondents (69.3%) were satisfied with the work performance and support received from Krushi Tais and it was an effective intervention.

#### A2: Promoting Climate Resilient Agriculture

#### Households with Cultivable Landholdings

In CM-VI Survey, it was observed that out of a total of 480 households, 92.7% of households owned and/or cultivated agricultural land. This suggested that agriculture plays vital role in the economy and lifestyle of the community in which these households were located. Owning and cultivating agricultural land provided families with a source of income, as well as access to fresh produce and livelihood support.

#### Women Landholders in Households

As per CM-VI Survey, it was observed that out of the 445 landholding beneficiary households in Project Area, about 117 or 26.3% reported that a woman member in their household owned agricultural land. The majority of households, 328 or 73.7%, reported that no woman member in their household owned agricultural land. This data highlighted an entrenched gender disparity in land ownership within the community. The low percentage of women owning agricultural land suggested that there may be cultural, social, or legal barriers that prevented women from owning or inheriting land. This could have significant economic and social implications for women in these households, as land ownership was often tied to access to resources and decision-making power.

#### **Cost of Cultivation of Major Crops**

It was observed that in the project villages cost of cultivation of cotton, pigeon pea, chickpea, and green gram was reduced whereas there was a slight increase in the case of soybean and pigeon pea. This may be attributed to the significant hike in the cost of seeds with the heavy incidence of diseases and pests resulting in higher expenses incurred on sprayings for control which was observed in the case of soybean.

#### Low Crop Damage Reported by Beneficiaries

Regarding queries on Crop damage, 68.2% of respondents from Project villages and 72.4% of respondents from Control Villages reported that they had not suffered any damage to crops. The relatively low percentage of respondents reporting crop damage indicated that agricultural



production in the community was relatively resilient to external factors such as pests, diseases, and extreme weather events.

#### Activities for Climate Resilient Agriculture Systems

In the Project area, the highest proportion of beneficiaries availing DBT benefits in the project area was for the "Guest Farmer" category, with 28.66% of beneficiaries having availed these benefits. "Drip Irrigation" followed this with 22.69% of beneficiaries, "Sprinkler Irrigation" with 19.70% of beneficiaries, and "Host Farmer" with 9.55% of beneficiaries. Other categories had relatively lower proportions of beneficiaries availing benefits, ranging from 2.69% to 1.49% for categories such as "Production of foundation & certified seeds of climate resilient varieties," "Backyard poultry," and "Farm Mechanization." The lowest proportion of beneficiaries availing benefits in the project area was for "Construction of Individual farm pond or farm pond lining" and "Recharge of open dug wells," both at 0.60%. The proportion of beneficiaries availing benefits varies across different categories and was generally higher in the project area as compared to the control area.

#### The trend in Proportionate Share of Different DBT Beneficiaries

Positive trend was observed in Drip irrigation, Sprinkler irrigation, Backyard Poultry, and Farm Mechanization. The percentage of farmers availing of drip irrigation benefits increased from 18.2% in CM-IV to 21.5% in CM-V and further to 22.7% in CM-VI. This indicated a steady increase in the adoption of drip irrigation over time. The percentage of farmers availing sprinkler irrigation benefits increased from 13.1% in CM-IV to 17.3% in CM-V and further to 19.7% in CM-VI. Similar to drip irrigation, there was a consistent upward trend in the adoption of sprinkler irrigation too. The percentage of people availing of sprinkler irrigation had exhibited consistent growth over time. The percentage of farmers availing of backyard poultry benefits increased from 0.0% in CM-IV to 1.2% in CM-V and further to 2.7% in CM-VI. This suggested a gradual rising interest in backyard poultry farming. The percentage of farmers availing of farmers availing of an echanization benefits increased from 0.9% in CM-IV to 1.2% in CM-V and further to 2.7% in CM-V.

#### **Category-wise DBT Applications**

The Category wise DBT applications represent the social categories of the beneficiaries. Out of the total 480 beneficiaries, 58.1% were from the Other Backward Class (OBC) category (in CM-V it was 61%), followed by the General/Open category with 12.7% (about 11.5% in CM-V), Scheduled Tribes with 8.8% (in CM-V it was 7.5%, which was an increase of more than 1% in this CM round), Nomadic Tribes with 7.7% (it was 5.2% in CM-V, indicating a healthy growth in support to NT by about 2.5% over the previous round). However in case of Scheduled Castes, it was about 7.5%, which just reduced to about half from previous round



of Survey (it was 13% in CM-V). Decline in SC category could be on account of this particular category getting better benefits under other government supported systems. The Other category accounted for 5.2% in CM-VI (it was increased from the CM-V round, where it was only 2.1%) of the total beneficiaries. This data highlighted the social diversity of the beneficiaries and the importance of considering social categories in project design and implementation.

#### **Trainings Received for CR Technologies**

The CM-VI Survey indicated a positive trend with respect to trainings received on CR Technologies. In general, the project areas had received higher training percentages across all the agricultural practices compared to the control areas. The practices with the highest training percentage in the project areas were "Use of improved seed varieties" (69.30%), "Intercropping" (47.00%), and "Contour cultivation" (39.00%). The practices with the highest control area percentage were "Use of improved seed varieties" (21.9%), "Intercropping" (12.1%), and "Contour cultivation" (8.6%). Apart from these, beneficiaries from Project areas had also gone through trainings on "Seed Treatment" (24%), "Integrated Nutrient Management" (8.7%), and "Implementation of BBF" (6.3%), with BBF being an important component for CRT promoted by the project. It was observed that respondents from Project Areas had shown much interest in Cultivation by BBF technology.

#### Adoption of Climate-Resilient Technologies

It was observed that project beneficiaries had adopted various CR technologies since the inception of the project The most widely adopted technology in both areas was the use of improved seed varieties, with 66.3% of farmers in the project area and 33.2% of farmers in the control area using improved seeds. The second most widely adopted technology in both areas was intercropping, with 40.7% of farmers in the project area and 18% of farmers in the control area practicing it. The third most widely adopted technology in both areas was contour cultivation, with adoption rate of 33.7%.

About 59% of beneficiaries reported that they had benefitted from the climate-resilient technologies which they had adopted. Those who reported of benefitting from the adoption of CR technologies cited of reduced cost of cultivation (86%), better control over pests and diseases (68%), soil and moisture conservation (44%), and improved soil fertility (35%). Other responses included improved germination rate, optimum use of pesticides and fertilizers, and increased water availability.



#### Feedback on Farmers' Field School Conducted

The major crops demonstrated in the Project area were cotton, soybean, and chickpea with or without intercropping. More than three-fourth respondents (76%) felt that there were differences between the demo and control plots in terms of quality and quantity of produce. The CM-VI survey data suggested that a significant proportion of host farmers may have joined the FFS without being specifically convinced by any particular person or group. However, among those who did cite a specific persuader, Agriculture Assistants were reported to be the most influential, which may have implications for future outreach and engagement efforts related to the FFS program. The Guest Farmers adopted a few technologies after the training, which included Spraying techniques with safety measures (45%), Preparation of pesticide formulations & spraying (42%), and Foliar application of 2% DAP (26%). About 12 to 14% of the respondents also reported adopting Integrated Weed Management, Seed treatment with bio-fertilizers, and Crop residue management.

#### Individual DBT Benefits

Drip and Sprinklers irrigation were observed to be the most common benefit (each around one-third) that the farmers had applied for. Some of the other less common benefit that the farmers had applied for were, Seed Production / Production of foundation & certified seeds of climate resilient varieties, Backyard poultry, Farm Mechanization (Tractor/ Power Tiller/ Power Weeder/ Roto-cultivator/ Seed cum Fertilizer Drill), FFS Host Farmer Assistance/Agronomic practices FFS, Horticulture Plantation/Plantation of Horticulture Crops etc. Though there were a basket of about 30 different types of benefits provided under the PoCRA project, other benefits were rarely in demand among the farmers. This needs some attention. It was found that the majority of the beneficiaries were satisfied with the project timeline, accessibility, and cost-effectiveness. The project was well designed and implemented to meet the needs and expectations of the beneficiaries. Only a small fraction of the beneficiaries faced some challenges or cost constraints in accessing the project benefits, which could be addressed by further improving the project delivery and communication.

#### Seed Production

Seed production is an important intervention in PoCRA and about 4.3% of beneficiaries from the Project area availed of this benefit under DBT. It was observed that beneficiaries preferred to buy seeds from Farmer Producer Companies. The majority of the individuals involved in seed production believed that the seeds produced were resilient to climate conditions, which indicated that focussed efforts were made to select or develop seeds that were adapted to local environmental conditions.



#### **Horticultural Plantation**

The CM-VI data suggested that the custard apple was the most commonly planted horticultural crop among the beneficiaries in the Project area followed by Lime/ Sweet Lime. All the respondent beneficiaries from Project areas had installed drip irrigation. The adoption of drip irrigation by all respondents suggested that they were aware of the benefits of this irrigation method and were willing to invest in it to improve their crop production. It also indicated that successful awareness-raising campaigns or Project interventions were undertaken in the region promoting the use of drip irrigation for fruit crops.

#### A3: Promoting efficient and sustainable use of water for agriculture

#### Sources of irrigation

It was recorded that the most common irrigation source was through dug well, (P:67.7% reported using this method). The second most common source was the borewells (P: 23.0% reported using this method). Only a small percentage of households reported using other sources of irrigation, such as a canal, river, farm pond, earthen dam/check dam, or other specified sources. The prevalence of dug wells and borewells as the main sources of irrigation suggested that usage of groundwater was the primary water resource for agricultural production in this community. It was worth noting that the overuse of groundwater could lead to negative environmental and economic consequences, such as the depletion of ground water in aquifers and increased costs for drilling deeper wells. The relatively small number of households using other sources of irrigation may suggest that these sources may be less reliable or accessible in the community, or that they may be less suitable for the types of crops grown in the area.

#### **Drip irrigation**

Of the 76 beneficiaries of drip irrigation in the sample, 49 beneficiaries had reportedly completed the activity (installed it in their farms) and started using it. Almost three-fourths of the drip irrigation beneficiaries felt that water consumption and wastage in agriculture had reduced after the adoption of drip irrigation. A significant minority of respondents from the project area (P: 34.4%, C:30%) reported using drip irrigation on a seasonal basis, which suggested that they used drip irrigation regularly during certain periods of the year, such as the dry season or during specific crop stages. This could be an effective strategy for managing water use and maximizing crop yields during critical periods.

#### Sprinkler System

This activity ranked second and was availed by 64 beneficiaries as per the data collected from CM-VI Survey. Based on the data, it appears that before the use of sprinkler systems, the



crops grown were primarily soybean, chickpea, cotton, and pigeon pea. After adoption of sprinkler system the focus had shifted more toward Chickpea (percentage increase from 29.27 to 37.14), Onion (2.44 to 4.29%), and Wheat (0 to 5.71%). It was also observed that the focus on Pigeon Pea was reduced from 7.32% to 4.29%. Majority of respondents (68.8%) believe that water consumption and wastage in agriculture had been reduced after adoption of sprinkler system.

#### **NRM Activities**

Based on the Project Survey data, 60% of the respondents believed that the ground water level has increased near their farm land after the construction of the NRM asset. This was a positive outcome and suggested that the construction of the NRM asset has had a beneficial impact on the water table in the area. On the other hand, 34% of respondents believed that there has been no increase in ground water level, but they believed that it could increase in the future. This suggested that there was still some uncertainty about the long-term impact of the NRM asset on the water table. Only 6% of respondents did not expect any change in ground water level. This could be due to various factors such as lack of knowledge, prior experience or other factors. Overall, the data indicated that the construction of the NRM asset has had a positive impact on the ground water level according to a majority of respondents.

#### **Component B: Post-harvest Management and Value Chain Promotion**

#### **Farmer Producer Companies**

It was observed that out of 21 FPCs in the Project 97% were functional. Of the 63 respondents 46.0% reported that they were aware of the business plans prepared by their company for financial support from PoCRA, while only 6.3% answered that they were not aware of such plans. With regard to selling agricultural produce through FPC in the past, 14.3% reported that they had sold their agricultural produce through FPC, while the vast majority of respondents, 85.7% answered that they had not sold their produce through FPC. This suggested that a large proportion of farmers surveyed in this study had not yet availed themselves of the opportunities presented by FPCs to sell their agricultural products. It may be worthwhile for FPCs to undertake more awareness-raising activities and outreach efforts to educate farmers on the benefits of selling their produce through FPCs, as this could potentially increase the number of farmers who utilize FPCs for storing their inputs and marketing their produce.

#### Status of SHGs and Farmer Groups

In CM-VI Survey, 32 beneficiaries were interviewed. With regard to training on business establishment, out of 32 beneficiaries from the Project area, only 8 had received training on



business establishment. This suggested that there was a need for more training and support in business establishments, especially for those who were not yet equipped with the knowledge and skills in starting their own business. From the response generated from 32 beneficiaries of the Project area, it was found that 75% of the respondents' SHGs were currently involved in some form of income-generating activity, while the remaining 25% were involved only in monthly savings.

#### **Component C: Institutional Development, Knowledge, and Policies**

#### **Exposure Visits, Trainings and Awareness**

Out of the total 417 respondents (excluding FPC members), 17.0% had participated in some exposure visit (outside their village) which had been organized under the PoCRA project, while the majority 83.0% had not participated in any such visits. This suggested that there was a low level of participation in the training programs provided by PoCRA. It would be pertinent for the project to evaluate and address potential barriers to participation in order to increase the reach and effectiveness of exposure / training programs.

#### **Awareness of Project Information Boards**

Based on the survey, out of the total respondents, 50.1% were aware of the project information board, 17.7% were aware of the VCRMC board, 6.2% were aware of the board detailing activities under the project, 4.5% were aware of the board presenting the water balance activity details of their village, and 21.4% were aware of other boards. Overall, it appears that a significant portion of the respondents were aware of project information board sinstalled in their village, with the majority being aware of the project information board specifically. However it was also to be noted that a sizable portion of the respondents were not aware of these boards, indicating that there may be a need to increase awareness and communication about the project and its activities.

#### Awareness of the Grievance Box for PoCRA

Out of the total respondents, 36.20% indicated that they were aware of the grievance box at the Panchayat office for the PoCRA project while, 63.80% of respondents were unaware of the grievance box. This indicated that a majority of the respondents were not aware of the grievance box for the PoCRA project. This suggested that there may be a need for better communication and dissemination of information about the grievance box and its purpose to the community members involved in the PoCRA project.

#### **Agro-Met Advisory Services**

As per CM-VI Survey, the majority of respondents (62.7%) received an Agro-met advisory, while the remaining 37.3% did not receive it. Regarding the mode of receiving Agro-met



advisories, the majority reported receiving it through SMS on mobile (48.75%) or through WhatsApp (29.39%). A smaller percentage reported receiving it through a mobile app (10.75%), Newspaper (5.4%), Television (4.3%), Interactive voice response (0.72%), Radio (0.36%), or a Farmer app (0.36%). Among those who reported using Agro-met advisory, more than half (52.8%) found it to be useful and relevant, while only a small percentage (4.9%) reported receiving general advice and 0.9% reported that it was not useful.

The fact that a majority of respondents who reported using Agro-met advisory found it to be useful and relevant suggested that the service was meeting the needs of farmers in the area surveyed. Among those who do receive market price information and plan to market their produce, 32.6% reported that they planned to base their marketing decisions on the market price information received from Agro Advisory. On the other hand, 26.1% reported that they do not plan to market their produce based on this information. This data suggested that a significant proportion of farmers who received market price information from Agro advisory use it to form their marketing decisions.

#### Analysis from Kharpan Areas

Salinity has a significant implications for agriculture and other uses of water in the *Kharpan* area, as saline water is more difficult and expensive to treat and use effectively. 28.6% reported that they received technical information from the Agricultural Department, which indicates that farmers in *Kharpan* villages rely on government support and advice for making decisions about their agricultural practices. 18.2% reported that they selected their irrigation method based on the observation of fellow farmers, which indicates that social networks and peer learning are important in shaping the agricultural practices of farmers in *Kharpan* villages. Only 1.3% reported other reasons for using a specific method of irrigation, which suggests that the reasons for choosing a particular method of irrigation are fairly standardized among farmers in the area. This also indicates that farmers in *Kharpan* villages consider a variety of factors when selecting a method of irrigation, including soil and water conditions, technical advice from the PoCRA, and learning from fellow farmers.



## 1 Project Overview

## 1.1. Project Background

Agriculture is the major occupation of the people in Maharashtra. The share of agriculture and allied activities in the total Gross State Value Added (GSVA) is 11.7 percent. Even though it shows a decreasing trend, a large population, especially in the rural areas is dependent on the sector for their livelihoods<sup>1</sup>. Reduction in the average landholdings size, increase in small & marginal farmers, monsoon variabilities, water use efficiency and market fluctuations are some of the major challenges for the state. Around 40% of the state falls under drought prone area, having annual average rainfall less than 750 mm (29.5 in). Drought is observed in the state once every 5 years. In Maharashtra, growth in the sector fluctuates heavily and is depending on highly erratic rainfall during any particular year and rainfall variability over time. The distribution of rainfall is highly uneven within the state and ranges from over 4000 mm per annum in coastal areas to less than 400 mm in some of the most arid districts.

Agriculture remains the highest user of freshwater, withdrawing more than 80 per cent of the surface and groundwater ("blue water") available to the state. Since the continuation of the State's strong economic growth performance would have to be supported by higher water availability in all three sectors of the economy, there is a need for Maharashtra to better manage its water resources and in particular to enhance the efficiency of the water used for agriculture and focus on increasing the availability and use by the agriculture sector of "green water" (rainwater stored in the soil as soil moisture). Severe consecutive droughts experienced in large parts of Maharashtra in recent years have considerably affected the state's agricultural performance and social fabric in rural areas and have prompted the highest-level state authorities to declare, "Drought proofing" of agriculture a key development priority of Maharashtra.

Vidarbha is one of the most drought prone area in the state, along with Marathwada. The region lies in the eastern part of Maharashtra comprising 11 districts out of which 7 have been selected as part of the Rest of Project area for PoCRA. The region occupies 31.6% of total area and holds 21.3% of total population of Maharashtra. Most of the crops are rain-fed comprising of cotton, soybean, pigeonpea and chickpea. According to ministry of Agriculture,

<sup>&</sup>lt;sup>1</sup> Average size of operational holding as per Agriculture Census 2015-16 is 1.34 ha whereas as per Agriculture census 2010-11 it was 1.44 ha. Number of small and marginal operational holdings were 121.55 lakh, which were 79.5 per cent of the total number of operational holdings. (Source: ES, 2020-21)



cultivation of BT cotton in the region has added to the crisis, since the variety is sensitive to the water shortages.

This has made cotton cultivation a high risk –high cost cultivation system in the region without assured irrigation and irregular rainfall.

According ICRISAT reports, Climate Change has become a reality in Vidarbha region. IPCC states that extreme weather events are on the rise. The AR5 of IPCC says that rainfall will become more erratic, rainy days will reduce and intensity of rainfall will increase.

Given the above challenges, the Agriculture task force constituted by the NITI Aayog along with State govt. has proposed the following objectives for the DoA, GoM:

- Integrated farming approach, which includes Horticulture, Dairy & Animal Husbandry, Poultry, Fishery, Watershed infrastructure etc.
- Increasing production and productivity of crops.
- Timely supply of quality inputs viz. fertilizers, Insecticides, Seed etc. to farmers.
- Dissemination of technology developed in agriculture and allied sector.
- Collection of agriculture and allied data and area, production, productivity through crop cutting experiments and use of collected data for future planning.
- Horticulture development and soil health improvement through Mission.
- Use of micro-irrigation system for increasing area under irrigation and productivity of water.
- Promotion of Agriculture Mechanization to overcome the problems of labour shortage.
- Promotion for Organic Farming.
- Preparing for exploiting global opportunities in fruits & vegetables while emphasizing the dual approach increase in food security.

In the light of above challenges and strategy, a flagship *Project on Climate Resilient Agriculture in Maharashtra (PoCRA)* with the support of the World Bank is being implemented in the drought prone regions of Maharashtra.

## 1.2. PoCRA Project & Its Significance

The strategy for accelerating agricultural growth requires action in terms of bringing technology to the farmers, improving the efficiency of investments, increasing areas under irrigation, increasing systems support and rationalizing subsidies, diversifying cropping pattern, while protecting food security concerns, and fostering inclusiveness through a group approach, by which the small and marginal farmers will get better access to land, credit and skills.



Enhancing climate-resilience in agriculture involves the integration of adaptation, mitigation, and other practices in agriculture that increase the capacity of the farmer and his/her production system to respond to various climate-related disturbances by resisting or tolerating the damage and recovering quickly.

To ensure the sustainability of the comprehensive on-farm and off-farm interventions required to build resilience in agriculture, there is a need to strengthen institutions, in particular at the local level, and improve their capacity to plan for adaptation to evolving climatic conditions and induce a change in local farming practices. In addition, the successful adoption of climate-resilient farming practices will largely depend on the farmer's perception of income gains from the new technologies, as profitability remains the most important incentive for change at farm level. To that effect, crop diversification, access to knowledge and farm assets needs to be accompanied by more market opportunities, which can be achieved through improved participation of organized smallholders in the corresponding value chains and the mobilization of private sector (e.g. Farmer Producer Organizations, agri-business SMEs).

### 1.3. Project Development Objective

The Project Development Objective (PDO) is **to enhance climate-resilience and profitability of smallholder farming systems in selected districts of Maharashtra**. PoCRA is built around a comprehensive, multi sector approach that focuses specifically on building climate resilience in agriculture through scaling up tested technologies and practices, while generating the following interdependent triple win solutions:

- Enhanced water security at farm level through the adoption of technologies for a more efficient use of water for agriculture, the increase in water storage capacity (surface and sub-surface) and the improvement in water distribution structures to address on-farm water
- II. <u>Improved soil health</u> through the adoption of good agricultural practices to improve soil fertility, soil nutrient management, and promote soil carbon sequestration; and
- III. <u>Increased farm productivity and crop diversification</u> through the adoption of climate-resilient seed varieties (short maturity, drought and heat resistant, salt tolerant) and market-oriented crops with a clear potential for income security derived from the integration of farmers in corresponding value-chains.





Figure 1: PoCRA Project Area

### **1.4. Project Components**

The project is designed for implementation through the following components and subcomponents:

#### Comp A: Promoting Climate-resilient Agricultural Systems

- A.1: Participatory development of mini watershed plans.
- A.2: On-farm climate-resilient technologies and agronomic practices.
- A.3: Climate-resilient development of catchment areas

#### Comp B: Climate-Resilient Post-Harvest Management and Value Chain Promotion

- B.1: Promoting Farmer Producer Companies
- B.2: Strengthening emerging value-chains for climate-resilient commodities
- B.3: Improving the performance of the supply chain for climate-resilient seeds

# Comp C: Institutional Development, Knowledge and Policies for a Climate-resilient Agriculture

- C.1: Sustainability and institutional capacity development
- C.2: Maharashtra Climate Innovation Centre
- C.3: Knowledge and policies



#### 1.5. Study Area

CM-VI survey was conducted in the rest of the project area, which is the eastern region of Maharashtra with the revenue divisions and districts mentioned below:

- i. Amravati division: Amravati,Akola, Buldhana, Yavatmal &Washim
- ii. Nagpur Division: Wardha
- iii. Nashik division: Jalgoan (Khandesh)



The project area is classified under .Agro-ecological sub-region characterized

Figure 2: Study Area

as moist semi-arid ecological sub region with medium deep clayey black soils (shallow loamy to clayey black soils as inclusion). As per the planning commission, the domain districts of the project area *viz.,* Akola, Washim, Buldhana, Amravati, Wardha and Yavatmal falls under agroclimatic zone *i.e.* western plateau and hills region. As per the NARP agro climatic zone classification, the project area is classified under Central Vidarbha (AZ- 97) whereas the Jalgaon district falls under Western Plateau and Hills Region (IX) with agro ecological sub region of Deccan plateau, hot semi-arid eco-region (6.3) Western Maharashtra plateau, and hot moist semi-arid eco- sub region.

The major Kharif crops grown in the districts are Cotton, Soybean and Pigeon pea. The area under cereal crops has declined gradually with the induction of cash crops. Major Rabi crops grown in the project area are Chickpea, Wheat and Sorghum. Major area is covered by Chickpea (Gram) followed by Wheat and rabi Sorghum.

The rest of the project area also includes a belt of salinity-affected area in the districts viz; Akola, Amravati, Buldhana and Jalgaon. Some of the villages in these districts fall under the vertisols of the Purna Valley, which are having saline tract. The term salinity refers to the presence in soil and water of various electrolytic mineral solutes in concentrations those are harmful to many agricultural crops.



## 2 Approach & Methodology

## 2.1. Objectives of Concurrent Monitoring

As per the ToR, Concurrent Monitoring focuses on process monitoring for all Components and sub-components of PoCRA. The concurrent monitoring will also look into the compliance with ESMF framework. In addition, values of the RFID indicators have to be also brought out as part of the monitoring.

The main objective of concurrent monitoring is the regular collection and reporting of information to track whether expected results are being achieved as planned. Concurrent Monitoring focuses on systematic and periodical collection and analysis of data for measuring process and progress of the project. A total of 10 concurrent monitoring rounds are planned to be conducted during the 5-year project period, once every six months. This round is 6<sup>th</sup> in the series.

### 2.2. Monitoring Framework

A mixed methods approach is used for collecting both quantitative and qualitative data for process and progress monitoring as part of CM-VI in the Rest of Project area.



**Process monitoring** focuses on the interventions being carried out as part of the project, whether and/or how well the activities are being implemented. It also covers the use of resources. It is designed to provide the information needed to continually plan and review work, assess the success of the implementation of the project, identify and deal with problems and challenges, and take advantage of opportunities as they arise.



**Progress monitoring** on the other hand, intends to assess the changes brought about by a project or programme on a continuous basis. Mostly the changes are measured with a set of indicators targeting the outcome level changes over a period. For PoCRA, the RFID indicators will be measured through concurrent monitoring.

The designed study tools focused on required information for the above parameters. To ensure that the monitoring is participatory, survey team had a detailed discussion at various stages of implementation with beneficiaries as well as in the form of Key Informant Interviews (KIIs).



Survey as per the approved sampling list with real-time monitoring through Dahboard

**Benficiary** 

Key Informant Interviews (KIIs) as per the approved checklist

Data Compilation & Analysis Submission of Concurrent Monitoring Report to the PMU

Figure 3: Monitoring Framework

### 2.3. Sampling Methodology

As per the ToR (Table below), the Concurrent Monitoring (CM) was conducted on a sample of 32 clusters in each round, covering the 320 clusters in 10 rounds. For this purpose, all the 320 project clusters were arranged district-wise and, within district, Taluk-wise. From this sorted list a systematic sample of 32 (one-tenth of the) clusters were selected by applying systematic random sampling procedure. From within each selected cluster, one village was selected at random for CM- VI.

Table	1: Sample	Size as	per ToR
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Concurrent	No. of clusters in which	No. of villages for	No. of villages
Progress	the monitoring is to be	treatment group (1	for control
Monitoring	conducted	village per cluster)	group
Concurrent 1	32	32	16
Concurrent 2	32	32	16
Concurrent 3	32	32	16



<b>^</b>			
Concurrent 4	32	32	16
Concurrent 5	32	32	16
Concurrent 6	32	32	16
Concurrent 7	32	32	16
Concurrent 8	32	32	16
Concurrent 9	32	32	16
Concurrent 10	32	32	16
Total	320	320	160

For the control group, of the selected 32 project clusters, 16 clusters were selected systematically. Corresponding to each of these 16 project clusters, a matching (in terms of vulnerability index) 16 control clusters were selected preferably from the same districts and Taluks. Next, from each of these 16 selected control cluster, one village was selected at random. Thus, there are 16 control villages that are comparable and adjacent to the selected project villages. In total, there are 48 villages for CM-VI, 32 villages from project area and 16 villages from control area.

#### Selection of Beneficiaries (for individual activities)

For each selected project village, a list of individual beneficiaries, community beneficiaries, farmer field school participants and SHGs were obtained from the PMU. The field team obtained the corresponding list for the control villages by visiting the villages and enquiring with concerned officials or from their records.

- Beneficiaries covered under the POCRA project up till 30<sup>th</sup> September 2022 were the target group for CM-VI.
- The list of individual DBT beneficiaries along with the benefits applied for (Pre sanctioned received & paid separately), Farmer Field School (FFS) participants was obtained from the PMU.
- Similarly, for Farmer Field School (FFS), both Host Farmers and Guest Farmers were obtained.

## 2.4. Selection of Beneficiaries

For selection of beneficiaries, separate lists of beneficiaries with pre-sanction given, subsidy released, host farmers, guest farmers, FPCs, SHGs and NRM villages for the project area were obtained from the PMU. For the control villages, the lists were made by visiting the villages, contacting officials and other means.

From the lists thus obtained from each selected village, 3 to 5 DBT beneficiaries with subsidy received (paid) and 2 DBT beneficiaries with Pre sanction given were selected. Regarding



Farmer Field School, the sample was 1 Host farmer and 3 Guest farmers (including 1 woman) from each selected village.

In addition, wherever Farmer producer companies (FPCs) and SHGs were present, 5 FPC members including the director and 5 SHG members were selected. Furthermore, NRM work undertaken in 5 villages were selected and the sample was 10 beneficiaries from each such NRM activity.

#### Procedure for Selection of DBT & FFS Beneficiaries

First, all the beneficiaries who were paid subsidy (as per PMU list) were sorted village-wise and repetition of names if any were discarded. The list was further sorted by sex of the beneficiary. From the sorted list, a systematic sample of 143 beneficiaries per village were selected. Secondly, the list of beneficiaries received for pre-sanction were sorted village-wise and repetition of names were excluded. Further, from this list, beneficiaries if any were already selected under paid category were also excluded. From the shorted list, a systematic sample of 2 beneficiaries per village with at least one female beneficiary, if any, were selected. However, if the number of beneficiaries in a village was less than 2 then all the beneficiaries were selected and the remaining required beneficiaries were selected from villages with very large number of beneficiaries.

The same procedure was applied in respect of selection of host farmers and guest farmers.

#### Procedure for Selection of FPC & SHG Beneficiaries

For FPC & SHG beneficiaries, a list of such institutions was supplied by the PMU and so a sample of institutions from the list was selected. During the field survey, the investigators were instructed to visit the selected sample institutions (FPCs & SHGs) and to obtain the list of members in them. From the list made in this way, a systematic sample of 5 members including director was selected for FPCs. For SHG, a systematic sample of 5 members including the president was selected for interview.

#### **Control Village Beneficiary Selection**

- In case of Control Villages, we have approached the functionaries like Agriculture Officer, Gram Panchayat and Village Watershed Committee and sought the list of individual beneficiaries and community activities like community farm pond and SHGs.
- A ratio of 2:1 is followed for selection of Project & Control Village beneficiary selection
- From the list obtained, systematic sample of 15 beneficiaries was selected from each village



• In few villages, the list of beneficiaries was not available. In this case, investigators identified the beneficiaries through 'Snowball Sampling' method and interviewing the beneficiaries in that particular village.

The Sampling Size for each of the beneficiary type is provided in the table below.

Beneficiary Type	Sample Size (considered till 30.09.22)	
	Project	Control
I. Individual Activity	335	168
1. DBT	207	104
a. Subsidy Disbursed	143	72
b. Pre Sanctioned Received (2 per village)	64	32
2. FFS	128	64
a. Host Farmers (1 per village)	32	16
b. Guest Farmers (female) (1 per village)	32	16
c. Guest Farmers (male) (2 per village)	64	32
II. Community Activity	145	74
1. NRM Works (10 per village in 5 Villages)	50	25
2. FPCs (Director + 2 members)	63	33
3. SHG members ( Chairman + 3 members)	32	16
Total	480	242

#### Table 2: Sample Size Selected for CM-VI

In addition, PoCRA project functionaries from district level to village level, namely District Superintendent Agriculture Officer (DSAO) (1/district), Sub-division Agriculture Officer (SDAO) (1/subdivision), Agriculture Assistant/Cluster Assistant/ Agri Supervisor (1/cluster), FFS Facilitators/Coordinators (1/cluster), Krushi Tai (1/selected village), VCRMC (1/selected village) were also interviewed with a key informant interview checklist.

## **Study Tools**

An overview of the Survey Tools is shown in the table below

S No	Target Respondent(s)	Sampling Tool
1	Direct Beneficiary Transfer/	Beneficiary Questionnaire
	Individual Beneficiaries	

#### Table 3: Snapshot of Survey Tool for Concurrent Monitoring



2	FFS (Host & Guest Farmers)	Beneficiary Questionnaire
3	NRM Work	Beneficiary Questionnaire
5	FIG /SHG/FPC	Beneficiary Questionnaire & KII Checklist
6	FGDs with VCRMC	Key Informant Interview (KII) Checklist
7	Krushi Tai	Key Informant Interview (KII) Checklist
8	FFS Facilitators/	Key Informant Interview (KII) Checklist
	Coordinators	
9	Agriculture Assistant/Cluster	Key Informant Interview (KII) Checklist
	Assistant/Agri Supervisor	
10	Sub-division Agriculture Officer	Key Informant Interview (KII) Checklist
	(SDAO)	
11	District Superintendent Agriculture	Key Informant Interview (KII) Checklist
	Officer (DSAO)	

#### **Beneficiary Questionnaire**

A beneficiary questionnaire was administered to the selected sample beneficiaries as described above having the following information:

Part-A	Basic Information
Part-B	Farmer Field School (FFS)
Part-B (sub section)	Kharpan Area Feedback
Part-C	Individual Activities (Activity Wise Details to be filled)
Part-D	Community & NRM Work Activities
Part-E	FPCs & SHGs
Part-F	Democratic Feedback & Governance

#### **Key Informant Interviews (KIIs)**

Key Informant Interviews were conducted for eliciting responses from persons with informed perspective. The information obtained from the key informants was the qualitative information required for the process and progress monitoring for concurrent. Following KIIs were conducted as per the following checklists

 Checklist for Krushi Tai: Krushi Tai in the selected villages was identified and interviewed regarding their background, training obtained, activities in the field, number of farmers benefitted by type of benefit, opinion about cooperation from farmers, opinion about his/her role, and so on.



- Checklist for VCRMC: FGDs were conducted with the VCRMC to assess their membership, involvement of members, frequency of meeting, activities undertaken including selection and recommendation of beneficiaries for obtaining benefits, etc.
- FFS Facilitators/Coordinators
- Checklist for Agriculture Assistant/Cluster Assistant/Agri Supervisor
- Checklist for SDAO
- Checklist for Functionaries (DSAO/PD-ATMA, PS-Agri/PS-Agribusiness, PS Procurement & PS-HRD)
- SHG and FPO/FPC/FIG were interviewed using checklists as well as beneficiary questionnaire. Checklists was used in eliciting qualitative information on the perceived impacts, issues and challenges faced by them.

### 2.5. Data Collection Methodology

- Detailed questionnaires were prepared for beneficiaries, discussed and finalized with the PMU after the comments and suggestions
- KII Checklists were prepared and shared with the PMU for review
- In the next step, the questionnaires and checklist were refined based on the comments from PMU
- After finalization and approval from the PMU, they were field tested, refined and digitized into a computer assisted personal interview (CAPI) application. Post fieldtesting, the beneficiary questionnaire and checklists were modified, wherever required and finalized in consultation with the PMU.
- Simultaneously, required number of field investigators and supervisors with minimum graduate qualification and belonging to farmer-households in the project area were appointed.
- The investigators and supervisors were provided training & orientation before initiating the actual survey in the project area. The training was conducted using the finalized survey tool in the App.
- Rigorous training of supervisors and enumerators was conducted bi-weekly so that they were well versed with the roles & responsibilities of different functionaries, structure of project implementation, purpose of interviewing the functionaries, method of filling datasheets and preparation of qualitative reports.
- The dashboard for real time survey monitoring was created and shared with PMU



### 2.6. Quality Assurance Mechanism

- Continuous monitoring and field checking of the investigators were done by the supervisors through a dashboard created with login IDs
- The field supervisor team and the key experts were involved in the training of investigators and the field orientation. The local team from the project area with an experience in watershed management activities are present
- Field supervisors (one in each district) were engaged in the study for supervising data collection on a daily basis and checking for correctness and completeness of the data collected by the field enumerators during the field survey
- Additionally, the supervisors were in liaison with district officials, conducting Key Informant Interviews (KIIs) using the approved checklists and prepared summary report of the discussion points during KIIs
- Once the survey was completed, the data were checked for correctness, completeness, consistency and errors if any were corrected to the extent possible.
- After the data were checked and cleaned, required tables were generated in consultation with the subject experts, and appropriate indices were derived besides generating final tables and charts
- Simultaneously, drafting the concurrent monitoring report was taken-up by the subject experts and a combined report was finalized and submitted


# 3 Sample Coverage

As per the ToR, 32 clusters were selected for project area and matching 16 clusters were selected in control area. One village in each project and control cluster was selected as shown in the table below.

Sample Coverage-Project Villages								
District	Clusters	Villages	Beneficiaries					
AKOLA	8	8	99					
AMRAVATI	6	6	111					
BULDHANA	8	8	87					
JALGAON	5	5	99					
WARDHA	1	1	18					
WASHIM	2	2	27					
YAVATMAL	2	2	39					
Total	32	32	480					

Table 4	Sample	Coverage	-Proiect	Villages
	Sample	Ouverage		Villages

Table 5: Sample Coverage- Control Villages

Sample Coverage-Control Villages									
District	Clust	ers Villages	Beneficiaries						
AKOLA	3	3	47						
AMRAVATI	3	3	45						
BULDHANA	4	4	51						
JALGAON	4	4	42						
WARDHA	-	-	22						
WASHIM	1	1	17						
YAVATMAL	1	1	18						
Total	16	16	242						

#### **Beneficiary Sample Coverage**

Total five categories have been covered as part of project beneficiaries: Direct Benefit Transfer (DBT-Pre & Post), Farmer Field School (FFS), Community based Natural Resource Management (NRM) activities, Farmer Producer Companies (FPCs) and Self-Help Groups (SHGs). A total 480 beneficiaries were covered as part of CM-VI. Of them 33% of the respondents (as part of CAPI application) were DBT beneficiaries, followed by 27% FFS



members. NRM works comprised 11% of the beneficiaries. 13% were part of FPOs and 7% SHG under the project for CM-VI.



Figure 4: Beneficiary Distribution in Project Villages

Table 6: Sample	Coverage	of Beneficiaries	in Project	Villages
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Activity/ District	Akola	Amravati	Buldhana	Jalgaon	Wardha	Washim	Yavatmal	Total
DBT - Pre-sanction		10	-	10				
given	11	12	17	12	2	4	6	64
DBT - Subsidy Released	29	17	36	36	3	2	20	143
FPO	18	3	12	0	12	12	6	63
Guest Farmer	12	15	24	20	8	9	8	96
Host Farmer	3	5	8	8	1	2	5	32
NRM/CF Pond	10	10	10	10	0	0	10	50
SHG	4	4	0	2	8	8	6	32
Total	87	66	107	88	34	37	61	480

#### **Beneficiary Sample Coverage in Control Villages**

For control villages, total of 240 beneficiaries were covered under Individual activity like Sprinkler Irrigation, Drip Sets, Water Pumps, etc.; Community Activity like farm ponds, soil & water conservation structures; activities taken up by SHGs.





Table 7: Sample coverage of Beneficiaries in Control Villages

Activity/ District	Akola	Amravati	Buldhana	Jalgaon	Wardha	Washim	Yavatmal	Grand Total
DBT - Pre-sanction	7	8	7	3	2	1	4	32
DBT - Subsidy Released	16	13	19	19	4	1	0	72
FPO	9	3	6		6	6	3	33
Guest Farmer	6	7	10	11	5	5	4	48
Host Farmer	2	7	4	2	1	0	0	16
NRM/CF Pond	5	5	5	5	0	0	5	25
SHG	2	2	0	2	4	4	2	16
Grand Total	47	45	51	42	22	17	18	242

Figure 5: Beneficiary Distribution in Control Villages

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Figure 6: Beneficiary Coverage in Project & Control Villages



# 4 Findings from CM-VI Survey

# **Component A: Promoting Climate Resilient Agriculture Systems**

Climate Resilience in agricultural production systems is the main component under the project. The objective is to strengthen adaptive capacity of farmers through interventions at farm level, complemented by interventions for increasing access to irrigation.

The activities identified under this component have been prioritized through participatory micro planning. Farmers Field School (FFS) is one of the main activities under this component. The component also supports farmers through a range of agri-based activities through matching grants. Direct Benefit Transfer (DBT) technology is being used to ensure transparency and accountability.

As part of CM-VI, data has been collected on relevant parameters under this component and activities. Participatory micro planning, FFS and DBT effectiveness has been covered under this component part of three sub-components: *A1: Participatory Development of Mini Watershed Plans; A2: Climate-Smart Agriculture and Resilient Farming Systems and; A3: Promoting efficient and sustainable use of water for agriculture.* Feedback on activities, support through PoCRA, benefits, issues and challenges has been recorded and presented in this section.

# A1: Participatory Development of Mini Watershed Plans

The foundation for any project is an effective Micro-Planning Process (MLP). The component supports the community to plan the adoption strategy at the village level. SDAO are responsible for overall MLP process. Village Climate Resilience Agriculture Management Committee (VCRMC) and female farmer friend (Krushi Tai) actively participation and facilitate to ensure effective micro planning. As part of the survey, feedback has been obtained from farmers, VCRMC & Krushi Tai on the awareness, functioning, issues and challenges.

# **Salient Features of Micro Plans**

Micro planning has been completed in Phase-I villages. Some of the parameters included in micro plans are presented in the table below. Based on these parameters, activities are decided and it is ensured that maximum benefit is for the socio-economic vulnerable groups.

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#### Table 8: Salient Features of MLPs

S No	Parameters	Description
1	Village/Cluster Profile	Profiling of village/ cluster with respect to socio economic conditions, geo-physical characteristics, agriculture scenario, livestock status, infrastructure status and existing knowledge-extension services and ongoing scheme/programmes/ projects
2	Resource analysis	An account of natural resources existing in the village/ cluster with strength, weakness, opportunity and challenges.
3	Constraint analysis	Identification and analysis of constraints with respect to climate variability, surface & ground water status, soil health, crop productivity, post-harvest infrastructure & marketing, social and gender aspects
4	Causal analysis	Causes for the constraints identified in relation to - (a) Gaps in the yields of field crops, vegetable crops and fruit crops in the village (b) Gaps in development of the value chain of major commodities in the village.
5	Water Balance	Computation of water balance using the mobile application developed by the project. Description about the water balance of the village/ cluster considering the existing water harvesting structures and potential soil & water conservation treatments. Mapping of the proposed soil and water conservation structures along with crop planning based on water balance.
6	Opportunity mapping	An account of special needs of marginal and small holders, women, scheduled caste and tribe, and vulnerable category like differently abled etc.
7	Training Need Analysis	Description about the training needs including skills to be imparted to farmers, VCRMC members, women, youth and farmer/ women groups
8	Proposed interventions	Description of the interventions aiming at enhancing water security, soil health, crop production, agribusiness, mechanization, alternate and sustainable livelihood. Interventions to strengthen commodity value chains, infrastructure, better mobilization of farmers, imparting knowledge services
9	Livelihood and Agribusiness Plan	Plan for potential sustainable livelihood, agro-based enterprises, value chain development for the village/ cluster. The plan also takes into account the needs of the SHGs/FIGs/FPOs in the village/cluster
10	Environment and Social safeguards	Environment Screening checklist and compliance to social inclusiveness



# Awareness on Participatory Project & Micro Planning

As a part of CM-VI Survey beneficiaries except FPO category (total 417 respondents) were asked about their awareness of any village level micro-planning on watershed management conducted in their villages, 60% of the beneficiaries said that they were aware of it. This is similar to the results from last CM round.



Figure 7: Awareness on micro-planning on Watershed

The below figure shows the responses of individuals to an independent question regarding how they would rate the micro plan prepared for their village as part of the PoCRA project.



Figure 8: Rating the micro plan prepared for their village



Out of the total 417 respondents, 237 (56.8%) respondents indicated that they were satisfied with the micro-planning of their village. However, about 28% of respondents rated the micro plan as "Un-satisfactory". It may be necessary to evaluate the reasons for dissatisfaction and identify areas for improvement in the micro planning process

With regard to question on participation of family members in the development of village's micro-plans, out of the total 417 respondents, 182 (43.6%) answered that they or their family members were involved in the development of the micro-plans. While 68 (16.3%) respondents answered that, they or their family members did not participate in the development of the micro-plans.



Figure 9: Awareness about Water Budgeting App

A question was asked about the usefulness of Water budgeting App in the micro planning process, out of the 417 respondents, 55% answered it was useful, indicating that they found the water budgeting application to be extremely helpful in the micro planning process. About 1.4% respondents indicated that they did not find the application helpful at all. Additionally, 42.7% respondents answered "Not aware about this application," indicating that they may not have been aware of the existence of the water budgeting application.

#### Awareness about Water Budgeting

A question was asked about the awareness on Water Budgeting process conducted in the beneficiary villages, out of the 417 respondents, 166 (39.8%) replied that they were aware of the water budgeting process conducted in their village while 251 (60.2%) were not aware of it.



# Awareness on Representation of VCRMC Members

When asked about their thinking on VCRMC committee members representing all the sections of society in their village, out of the total respondents, 246 (59.0%) indicated that they believed the VCRMC committee members represent all sections of society in their village and 51 (12.2%) respondents answered that they did not believe the committee members represent all sections of society in their village. While, 120 (28.8%) respondents were either unsure or did not have enough information to form an opinion.



Figure 10: Opinion on VCRMC representation of all sections of Society

Overall, it can be interpreted that a majority of the respondents believed that the VCRMC committee members represent all sections of society in their village. However, a significant proportion of respondents were unsure or did not have enough information to form an opinion, and a smaller proportion did not believe that the committee members represented all sections of society.

# Awareness on Social Media Sites of PoCRA Project

We also asked the beneficiaries if they had ever visited the YouTube channel or Facebook page of PoCRA project. The below figure shows the response received.





Figure 11: Awareness on Social Sites of PoCRA

Out of 417 respondents, 153 (36.7%) answered positively that they are aware of Social sites of PoCRA and have visited the YouTube channel and Facebook page of PoCRA project; while 264 (63.3%) respondents answered negatively. This suggests that a relatively small percentage of the respondents have visited the project's social media platforms.

# Awareness of Project Information Boards in the Village

The below figure indicates the awareness on the different Project Information boards installed/ displayed in their villages.



Figure 12: Awareness on Installation of Project Information Boards



Based on total 480 respondents, 50% were aware of the project information board, 17.7% were aware of the VCRMC board, 6.2% were aware of the board detailing activities under the project, 4.5% were aware of the board presenting the water balance activity details of their village, and 21.4% were aware of other boards. Overall, it appears that a significant portion of the respondents were aware of project information board specifically. However, it is important to note that a sizable portion of the respondents were not aware of these boards, indicating that there may be a need to increase awareness and communication about the project and its activities.

# Satisfaction on Participatory Project & Micro Planning

The below figure shows the responses of 417 beneficiaries to the question regarding their satisfaction with the process for accessing the benefits of the PoCRA project.



Figure 13: Satisfaction on accessing the Project benefits

Out of the total respondents, 310 (74.35%) respondents were satisfied with the process for accessing project benefits, while only 20% were unsatisfied.

# Satisfaction on the work of VCRMC

As a part of the Survey a question was asked on the satisfaction on the work done by VCRMC. Out of the total respondents, 308 (73.9%) answered that they were very satisfied with the work of VCRMC, while only 80 (19.2%) were not satisfied with their work. The below figure shows how much beneficiaries are satisfied with the work of VCRMC.





Figure 14: Satisfaction on the work of VCRMC

It may be necessary to evaluate the reasons for dissatisfaction and identify areas for improvement in the work of VCRMC.

### Satisfaction on the support provided by the Project Staff

When asked about the satisfaction on the support provided by the Project Staff, a majority of the respondents (72.9%) rated the support provided by the project staff and availing the benefits from the project as satisfactory, while 20.6% of the respondents rated it as unsatisfactory. The below figure indicates the how much beneficiaries are satisfied with the support from the Project Staff.



Figure 15: Satisfaction on the support from the Project Staff



### Satisfaction with the knowledge of FFS facilitator

With regard to query on the satisfaction of beneficiaries with the knowledge of Farmer Field School (FFS) facilitator, out of 417 respondents 66.9% respondents found the knowledge of FFS facilitator to be satisfactory, while only 20.4% were unsatisfied.



Figure 16: Satisfaction with the knowledge of FFS facilitator

# Satisfaction on the performance of Krushi Tai

The female farmer friend, *Krushi Tai* is one of the key member who actively participates and facilitate to ensure effective implementation of the project activities. A question was asked about the satisfaction level with the work performance and support received from Krushi Tai.



Figure 17: Satisfaction on the Work Performance of Krushi Tai

Out of the 417 respondents, 69.3% of the respondents rated Krushi Tai's work performance and support as "Satisfactory," while 17.5% of them rated it as "Un-Satisfied". Overall, it can



be concluded that a significant proportion of the respondents (69.3%) were satisfied with the work performance and support received from Krushi Tai, while only a small proportion (17.5%) were un-satisfied with the work performance of Krushi Tais.

# Findings from KIIs with Krushi Tai

During the CM-VI Survey visits, interactions took place with a total of 24 Krushi Tai's (KTs) across various districts. The breakdown of the visits is as follows: 5 KTs in Amravati District, 5 in Akola District, 5 in Buldhana District, 3 in Jalgaon District, 2 in Washim District, 1 in Wardha District, and 3 in Yavatmal District.

# Work Experience of Krushi Tais

The details of meetings and discussions held with the Krushi Tai's (KTs) different districts are as follows:

- Amravati District: We interacted with 5 Krushi Tais (KTs) from Chincholi Bk., Parlam, Dhakana, Wadner Gangai, and Zilpi clusters under the PoCRA project. None of the KTs had prior working experience. They were working for the first time and were involved solely in the PoCRA project.
- 2. Akola District: We interacted with 5 Krushi Tais (KTs) from Mhaispur, Kund, Aurangpur, Sirso, and Nandkhed clusters under the PoCRA project. One KT from Mhaispur had been working as a Community Resource Person (CRP) of Self-Help Groups (SHGs) under the UMED project since 2020. Another KT from Kund had been working as an Accredited Social Health Activist (ASHA) worker in the Health Department since 2008. On the other hand, the KTs from Aurangpur, Sirso, and Nandkhed were working for the first time and were currently involved solely in the PoCRA project.
- **3.** Buldhana District: We had interactions with 5 Krushi Tais (KTs) from Manegaon, Bhuisinga, Pimpri Adhav, Amona, and Pahurjira clusters as part of the PoCRA project. Among them, one KT from Amona had prior work experience as a secretary of the Gram Sangha. However, the remaining KTs did not have any work experience. All the KTs were currently exclusively engaged in the PoCRA project.
- **4. Jalgaon District:** We had interactions with 3 Krushi Tais (KTs) from Susari, Bhadali Bk., and Deulgaon clusters as part of the PoCRA project. None of the KTs had any prior working experience. They were new to the workforce and were solely dedicated to the PoCRA project.
- **5. Washim District:** We had interactions with two Krushi Tais, from Waghola and Rajit Nagar clusters as part of the PoCRA project. Both KTs did not possess any previous



working experience and were embarking on their first professional endeavor. Their current engagement was solely focused on the PoCRA project.

6. **Wardha District:** We had an interaction with one Krushi Tai from the Bambarda cluster as part of the PoCRA project. The KT did not possess any prior work experience and was venturing into her first professional role.

**Yavatmal District:** We had interactions with three Krushi Tais (KTs) from Pandhurna, Kali (Tembhi), and Loni clusters as part of the PoCRA project. None of the KTs had any prior working experience. They were all new to the workforce and were exclusively dedicated to the PoCRA project at the present time.

# Knowledge on activities for landless stakeholders

The PoCRA project introduced various project activities, specifically targeting landless stakeholders to provide livelihood opportunities. These activities included small ruminants, poultry, sericulture, and apiculture.

- 1. Awareness: Most of the Krushi Tais were aware of the various project activities, particularly those aimed at benefiting landless stakeholders. However, they require updated information specifically regarding sericulture and apiculture activities.
- 2. **Provision of Activities:** The project had made provisions for small ruminants, poultry, sericulture, and apiculture activities for the landless stakeholders. However, the small ruminants' activity was withheld for some reason.
- 3. Lack of Interest: According to the Krushi Tais, the landless stakeholders had shown no interest in accessing the poultry, sericulture, and apiculture activities. It implies that these particular activities had not been actively pursued by the landless stakeholders despite being part of the inclusive benefit sharing criteria in the project.

#### Activities were taken up as a part of PoCRA

As part of the PoCRA project, the following activities were undertaken:

- Participation in VCRMC Meeting: The individual participated in VCRMC (Village Climate Resilience Management Committee) meetings, which are an integral part of the project.
- 2. Interacting with Women SHGs: The individual interacted with women Self-Help Groups (SHGs) and their members. They provided information about the project activities and motivated women farmers to participate in meetings and Farmer Field Schools (FFS).



- 3. Assisting the Cluster Assistant (CA): The individual supported the Cluster Assistant (CA) in various tasks and carried out assigned responsibilities as per the instructions of the Agriculture Assistant (AA).
- 4. **Providing Project Information:** The individual played a role in providing updated information about the project activities to the villagers, ensuring they were well-informed.
- 5. **Data Collection and Documentation:** The individual collected data and necessary documents related to the beneficiaries of the project, contributing to the documentation and record-keeping process.

### **Trainings Received from the Project**

Trainings for the Krushi Tai's were conducted both online and in a residential format. The duration of the trainings varied, with some programs held for 3 days, others for 5 days, and some for 7 days. **The topics covered during these trainings included:** 

- 1. **Roles and Responsibilities:** The trainings focused on providing the Krushi Tai's with a clear understanding of their roles and responsibilities within the project.
- 2. **Project and its Activities:** The trainings provided comprehensive information about the project and its various activities. This included details about the objectives, implementation strategies, and specific initiatives under the project.

Overall, the trainings aimed to equip the Krushi Tais with the necessary knowledge and skills to effectively carry out their roles and contribute to the successful implementation of the project.

SN	Krushi Tai's	Tehsil	District	Training	Topics	Organized
0.11	Cluster			Received		by whom &
				(Yes/No)		where
1.	Chincholi Bk.	Anjangaon	Amravati	No		
		Surji				
2	Parlam	Bhatkuli		Yes	03 days residential training	SDAO
					attended on roles &	Office,
					responsibilities.	Amravati
3.	Dhakna	Chikhaldara		No		
4	Wadner	Daryapur		Yes	05 days residential training	SDAO
	Gangai				attended on roles &	Office,
					responsibilities.	Paratwada
5	Zilpi	Dharni		Yes	01 day training attended on	TAO at
0.					roles & responsibilities.	Kusumkot
6.	Mhaispur	Akola	Akola	No		

Table 9: Table showing details of trainings given to Krushi Tais



7.	Kund	Akot		No		
8.	Aurangpur	Murtizapur		Yes	02 days residential training attended on roles &	TAO, Murtizapur
	Siree	Murtizopur		Vee	responsibilities.	TAO
9.	Sirso	Murtizapur		res	attended on roles &	TAO, Murtizapur
					responsibilities.	
10.	Nandkhed	Patur		Yes	02 days residential training	TAO, Patur
					attended on roles &	
			<b>D</b>		responsibilities.	0540
11.	Manegaon	Jalgaon	Buldhana	Yes	One day online training	SDAO,
	Bhuisinga	Nandura		No		Khamgaon
12.	Dhuisinga	Inditiduta				
13.	Pimpri Adhav	Nandura		Yes	07 days residential training	SDAO,
					attended on roles &	Khamgaon
					responsibilities and project	
					activities.	
14.	Amona	Chikhali		No		
15.	Pahurjira	Shegaon		Yes	07 days residential training	SDAO,
					attended on roles &	Khamgaon
					responsibilities and project	
					activities.	
16.	Susari	Bhusawal	Jalgaon	No		
17.	Bhadali Bk.	Jalgaon		Yes	02 days residential training	SDAO,
					attended on roles &	Jalgaon
					responsibilities.	
18.	Deulgaon	Jamner		Yes	02 days residential training	SDAO,
					attended on roles &	Jalgaon
	) M/a shala	Karania	) A/a a bias	Na	responsibilities.	
19.	vvayiiula	Lad	vva511111			
00	Rajit Nagar	Manora		Yes	02 days residential training	At Davha,
20.					attended on roles &	Dist.
					responsibilities.	Washim by
						SDAO
21.	Bambarda	Hinganghat	Wardha	No		
22.	Pandhurna	Arni	Yavatmal	No		
23.	Loni	Yavatmal		No		
24.	Kali (Tembhi)	Mahagaon		No		



# Exposure visits Undertaken

According to the information provided by the Krushi Tais, no exposure visits were organized within the district or state after joining the PoCRA project. Neither the clusters nor the district or sub-division level conducted any exposure visits. Therefore, there were no opportunities for the Krushi Tai's to participate in exposure visits.

### Participation in Project's micro-planning

Out of the 24 Krushi Tai's that were interacted with, 7 of them did not participate in the microplanning process of the project. These Krushi Tai's include Aurangpur in Akola District, Manegaon, Pimpri Adhav, and Pahurjira in Buldhana District, Susari in Jalgaon District, and Pandhurna and Loni in Yavatmal District. These Krushi Tai's did not have involvement or participation in the project's micro-planning activities.

### **Approach to Incomplete Activities**

The Krushi Tais approached project beneficiaries who had received pre-sanction but had not completed the activities as required. They took the following actions to motivate and support them:

- Encouragement and Timeline: The Krushi Tais insisted that the beneficiaries complete the activities within the designated timeline. They emphasized the importance of timely completion and assured the beneficiaries that subsidy would be released accordingly.
- 2. **Motivation through Interactions:** The Krushi Tais interacted with women members and farmers to motivate the beneficiaries. They shared information about the benefits and importance of completing the activities and encouraged them to take necessary actions.

The objective of these actions was to ensure that the beneficiaries fulfilled their commitments and successfully completed the activities outlined in their pre-sanction. The Krushi Tai played an active role in supporting and motivating the beneficiaries to meet their obligations.

#### Suggestion for other mediums to resolve issues

The effectiveness of the suggestion/grievance box in Gram Panchayats for communicating farmers' suggestions and grievances was found to be limited. However, alternative mediums were identified:

• VCRMC Meetings: Farmers can communicate their suggestions and grievances during Village Climate Resilience Monitoring Committee (VCRMC) meetings. These



meetings provide a platform for open discussions and allow farmers to voice their concerns directly.

- **SHG Meetings:** Farmers can also share their suggestions and grievances during Self-Help Group (SHG) meetings. These meetings serve as a forum for farmers to interact and discuss various issues, including project-related matters.
- **Project Team Resolution:** It was observed that most grievances were resolved at the village and cluster levels by the project team members. The close interaction and engagement of the project team with the beneficiaries allowed for prompt resolution of issues.

By utilizing these mediums, farmers have better opportunities to express their suggestions and grievances, leading to more effective communication and problem-solving within the project.

# Awareness of Beneficiary prioritization criteria

Among the 24 Krushi Tai's, 11 of them are well aware of the beneficiary prioritization criteria or the inclusiveness system that is built into the Direct Benefit Transfer (DBT) application of the PoCRA project. They have a clear understanding of how the system works and how beneficiaries are prioritized based on specific criteria.

However, it is worth noting that 13 Krushi Tai's stated that they are not aware of the beneficiary prioritization criteria or the inclusiveness system of the project. These Krushi Tai's lack knowledge or information regarding how beneficiaries are selected or prioritized within the PoCRA project's DBT application.

Overall, there is a mix of awareness levels among the Krushi Tai's regarding the beneficiary prioritization criteria or the inclusiveness system. Further clarification and information dissemination may be necessary to ensure that all Krushi Tai's have a comprehensive understanding of the system.

#### **Efforts to Mobilize Farmers**

To mobilize farmers, particularly female farmers, and ensure they receive the benefits under the NDKSP/PoCRA project, the following actions were taken:

 Encouraging Adoption of Climate-Friendly Technologies: The Krushi Tais actively encouraged women farmers to adopt climate-friendly technologies. This was done through Farmer Field Schools (FFS), where the Krushi Tai provided training and information about these technologies, highlighting their benefits and demonstrating their usage.



- 2. Visiting Women in Self-Help Groups (SHGs): The Krushi Tais attended SHG meetings to interact with women farmers and provide them with updated information about the project. These meetings served as a platform to motivate women farmers to participate in the FFS and take advantage of the project's offerings.
- Publicizing Successful Women Farmers: The Krushi Tai identified women farmers who had excelled in implementing climate-friendly technologies and shared their success stories with project officials. This was done to encourage and inspire other women farmers, while also giving recognition and publicity to those who had achieved notable results.

By actively engaging with women farmers, providing them with relevant information, and highlighting successful examples, the Krushi Tais aimed to mobilize and empower female farmers to participate in the project and benefit from the NDKSP/PoCRA initiative

# Status of Groups meetings

The Krushi Tais had been actively involved in various group meetings within the project. Here are the details:

- 1. VCRMC Meetings: The Krushi Tais had participated in monthly meetings of the Village Climate Resilience Monitoring Committee (VCRMC). Although she is a non-executive member of the committee, her presence and contributions during these meetings have been valuable in monitoring and discussing project-related activities.
- 2. Farmer Field Schools (FFS): The Krushi Tais had attended most of the FFS sessions organized within the cluster during the respective season. These FFS sessions serve as training and demonstration platforms for farmers to learn about climate-friendly technologies and practices.
- 3. **Self-Help Group (SHG) Meetings:** The Krushi Tais had attended at least two meetings of the Self-Help Groups (SHGs). These meetings provide an opportunity to interact with women farmers, share information about the project, and motivate them to actively participate in the project activities.

By actively participating in VCRMC meetings, attending FFS sessions, and engaging with SHGs, the Krushi Tais had demonstrated her commitment to the project and her involvement in supporting and empowering farmers within the community.

# Challenges in performing responsibilities

The Krushi Tais had identified several challenges in performing their responsibilities in project implementation. These challenges include:



- 1. Low Participation of Women Farmers: One of the challenges is the limited participation of women/women farmers in the project activities. Encouraging and motivating more women to actively engage in the project is a hurdle that needs to be addressed.
- 2. Limited Farmer Participation in FFS: The Krushi Tais had faced difficulties in getting farmers to actively participate in Farmer Field Schools (FFS). Increasing farmer engagement and attendance in these training sessions is a challenge that requires attention.
- Non-Implementation of Activities by Beneficiaries: Some beneficiaries who had received pre-sanctioned support had not fully implemented the activities as required. Ensuring that beneficiaries fulfill their commitments and complete the activities within the designated timeline is a challenge.
- 4. Lack of Interest from SHGs: The Krushi Tais had observed a lack of interest among Self-Help Groups (SHGs) in applying for project activities due to the initial investment required. Overcoming this financial barrier and motivating SHGs to participate in the project is a challenge.
- 5. Handling Issues with Withheld Activities: Dealing with farmers' concerns and managing issues related to withheld activities such as individual farm mechanization, PVC pipes, and electric motor pumps pose a challenge that requires effective resolution and communication.
- Subsidy Disbursement Delays: Delay in the disbursement of subsidies creates difficulties in handling beneficiaries' expectations and managing their grievances. Ensuring timely subsidy payments is crucial for smooth project implementation.
- 7. **Delayed Remuneration:** The Krushi Tais had faced delays in receiving remuneration from the VCRMC/SDAO office. Timely payment of remuneration is important to maintain the motivation and commitment of project team members.

Addressing these challenges will contribute to the successful implementation of the project and the effective engagement of beneficiaries and stakeholders.

# Family Support as Krushi Tai

The Krushi Tais had received support from their family members to fulfil their roles and responsibilities. This support from their family has enabled them to carry out their duties effectively as a Krushi Tai.

# **Remuneration status of Krushi Tais**

Out of the 24 Krushi Tais interviewed, 7 of them have not yet received their first remuneration or salary for working as a Krushi Tai.

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SN	Krushi	Tehsil	District	Remuneration	Remarks
5.N.	Tai's			received	
	Cluster			(Yes/No)	
1	Chincholi	Anjangaon	Amravati	Yes	Received first remuneration.
	Bk.	Surji			
2.	Parlam	Bhatkuli		Yes	Received first remuneration.
3.	Dhakna	Chikhaldara		Yes	Received first remuneration.
4.	Wadner	Daryapur		No	It is not received till date.
	Gangai				
5.	Zilpi	Dharni		Yes	Received first remuneration.
6.	Mhaispur	Akola	Akola	No	It is not received till date.
7.	Kund	Akot		Yes	Received first remuneration.
8.	Aurangpur	Murtizapur		No	It is not received till date.
9.	Sirso	Murtizapur		No	It is not received till date.
10.	Nandkhed	Patur		Yes	Received first remuneration.
11.	Manegaon	Jalgaon	Buldhana	No	It is not received till date.
		Jamod	-		
12.	Bhuisinga	Nandura		Yes	Received first remuneration.
13.	Pimpri Adhay	Nandura		Yes	Received first remuneration.
	Amona	Chikhali	-	No	It is not received till date
14.	7 inona	oninthan			
15.	Pahurjira	Shegaon		Yes	Received first remuneration.
16.	Susari	Bhusawal	Jalgaon	Yes	Received first remuneration.
17.	Bhadali Bk.	Jalgaon		Yes	Received first remuneration.
18.	Deulgaon	Jamner		Yes	Received first remuneration.
19.	Waghola	Karanja Lad	Washim	Yes	Received first remuneration.
20.	Rajit Nagar	Manora		Yes	Received first remuneration.
21.	Bambarda	Hinganghat	Wardha	No	It is not received till date.
22.	Pandhurna	Arni	Yavatmal	Yes	Received first remuneration.
23.	Loni	Yavatmal	]	Yes	Received first remuneration.
24.	Kali	Mahagaon	1	Yes	Received first remuneration.
	(Tembhi)				

#### Table 10: Details of remuneration status of interviewed Krushi Tais



Among the 24 Krushi Tais interviewed, 14 of them own a smartphone, while the remaining 10 use the mobile phones of their husbands or sons.

#### **Awareness of Social Media**

Out of the 24 Krushi Tais interviewed, 15 of them are aware of various digital mediums and applications such as WhatsApp, Facebook, YouTube, and digital payments like Paytm and Google Pay. However, 9 of the Krushi Tais are not familiar with these digital mediums. The challenges they face in using them are primarily due to the lack of their own smartphones and limited awareness about these technologies.

To address these challenges, it is recommended to provide training to the Krushi Tais on how to handle smartphones and utilize various digital mediums effectively. This would enhance their digital literacy and enable them to leverage these technologies for communication, information sharing, and accessing digital resources related to their work.

### Part of WhatsApp group at district/ subdivision/ cluster/ village level

All the Krushi Tais interviewed are part of the project's WhatsApp groups at the village or cluster level. Most of them regularly check the messages and notifications sent by the project on their registered mobile group. Additionally, 18 Krushi Tais are connected to the group at the subdivision level, while 6 of them are connected to the district-level groups.

#### Awareness of Digital Saksharta program

Among the 24 Krushi Tais interviewed, only 6 of them are aware that the project has initiated the digital Saksharta program (PMGDISHA-*Pradhan Mantri Gramin Digital Saksharta Abhiyan*) for all women stakeholders of the project. However, the majority, 18 Krushi Tais, are not aware of this program. It is recommended that the cluster team focuses on creating more awareness among the Krushi Tais about the digital *Saksharta* program to ensure maximum participation and benefits for the women stakeholders.

#### **Enrolment in Training**

Out of the 24 Krushi Tais interviewed, only 6 of them have enrolled themselves for the digital Saksharta program (PMGDISHA-Pradhan Mantri Gramin Digital Saksharta Abhiyan). The Krushi Tais who have registered for the program are Parlam Krushi Tai in Amravati District, Mhaispur and Nandkhed Krushi Tais in Akola District, Bhadali Bk. in Jalgaon District, and Waghola and Rajitnagar in Washim District. It is suggested that the cluster team ensures the registration of the remaining Krushi Tais for the PMGDISHA program to enhance digital literacy among them.



# A2: Promoting Climate Resilient Agriculture

Main objective under this component was maximizing productivity through transfer and adoption of climate resilient technologies. Feedback of farmers was obtained on agriculture practices, farmers' field school, and support through DBT activities. A comparison between project and control had also been presented.

# **Feedback on Agricultural Practices**

#### Households with Cultivable Landholdings

In CM-VI Survey, it was observed that out of a total of 480 households, 92.7% or 445 households own and/or cultivate agricultural land, while the remaining 7.3% or 35 households do not. While in Control 95.4% own cultivable lands.



Figure 18: Households with Cultivable Landholdings

This suggests that agriculture plays an important role in the economy and lifestyle of the community in which these households are located. Owning and cultivating agricultural land can provide families with a source of income, as well as access to fresh produce and other food products.

#### Women Landholders in Households

As per CM-VI Survey it was observed that 445 households in Project Area, about 117 or 26.3% (C: 23%) reported that a woman member in their household owns agricultural land. The majority of households, 328 or 73.7%, reported that no woman member in their household owns agricultural land. This data highlights a potential gender disparity in land ownership within the community.





Figure 19: Women Landholders in Households

The low percentage of women owning agricultural land suggests that there may be cultural, social, or legal barriers that prevent women from owning or inheriting land. This could have significant economic and social implications for women in these households, as land ownership was often tied to access to resources and decision-making power.

# Average Landholding

With respect to land holding, it was found that average landholding of the interviewed beneficiaries was 1.40 ha in Project villages and 1.34 ha in Control villages. The average irrigated area is 0.92 ha in project villages and 0.78 ha in control villages.



Figure 20: Average Land Holding and Irrigated Area (ha)



# **Cropping Pattern**

The following graph clearly shows the cropping pattern observed during CM-VI Survey. In Kharif season, Cotton occupied the highest in Project villages as it was preferred by 42 per cent of the beneficiaries, while it was only 35.3 per cent in Control villages. However, Soybean was more preferable in Control Villages as it was reported by 41 per cent of the beneficiaries, while in Project the response was only 38.2 per cent. Pigeon Pea occupied the third position with 18.1 per cent beneficiaries in Project Villages and 18.9 per cent in Control villages. The pulse crops Green gram had very less preference in these villages with 0.4 per cent from Project beneficiaries and 0.4 per cent from control beneficiaries. Similarly, 1.0 per cent beneficiaries from project and 4.3 per cent from Control villages preferred other crops to cultivate.



Figure 21: Kharif Crops Cultivated (%)



Figure 22: Rabi Crops Cultivated

As per CM-VI Survey data, Chickpea happened to be the most preferable crop during Rabi season covering 61.6 per cent in project villages and 66.5 per cent in control. Wheat occupied



the second with 16.5 per cent beneficiaries in Control villages growing this crop following by 14.4 per cent beneficiaries from Project Villages. Rabi season Maize occupied the third position with Project area occupying 11 per cent area and Control villages 8.9 percent. Other crops occupied 6.2 per cent villages in Project and 5.5 per cent in Control villages.

# Area, Production & Yield of Major Crops

Area, Production and Yield of major crops recorded in project and control villages is shown in the table below. Yield of major crops were reported as Soybean (P:7.21, C:6.95 q/acre), Cotton (P:7.54, C:6.95 q/acre), Pigeon pea (P:9.20, C: 8.18 q/acre), Green gram (P:2.20, C:2.0 q/acre) and in Rabi season Chickpea (P: 7.44, C: 7.38 q/acre), Wheat (P:11.15, C:9.07 q/acre), Rabi Maize (P:20.86, C:24.54 q/acre) and Rabi Sorghum (P:8.86, C:7.0 q/acre) respectively in project and control villages.

			Proje	ct			Cor	ntrol	
Sr. No.	Crop	Responses	Avg. Area ( Acre)	Avg. Production (q)	Avg. Yield (q /acre )	Responses	Avg. Area (Acre)	Avg. Production (q)	Avg. Yield (q/ acre)
	Kharif								
1	Soybean	237	4.33	31.21	7.21	110.00	3.85	26.78	6.95
2	Cotton	204	3.61	27.20	7.54	121.00	3.79	26.36	6.95
3	Pigeon Pea	109	1.25	11.47	9.20	52.00	1.20	9.79	8.18
4	Green Gram	1	5.00	11.00	2.20	1.00	4.00	8.00	2.00
	Rabi								
1	Chickpea	157.00	4.28	31.89	7.44	90.00	3.87	28.58	7.38
2	Wheat	39.00	2.28	25.44	11.15	21.00	2.76	25.05	9.07
3	Rabi Maize	21.00	2.93	61.10	20.86	16.00	3.13	76.69	24.54
4	Sorghum	4.00	1.75	15.50	8.86	1.00	2.00	14.00	7.00

Table 11: Area, Production and Yield of Major Crops reported in CM-VI

# **Cost of Cultivation of Major Crops**

Cost of cultivation of major crops in project and control villages is shown in the table below. The cost has been calculated using the Directorate of Economics & Statistics methodology. The highest cost of cultivation was recorded for Cotton (Project: Rs.27865/acre; Control: Rs.28145/acre) followed by Soybean (Project: Rs.21154/acre, Control: Rs.23466/acre), Chickpea (Project: Rs.20011/acre; Control: Rs.20669/acre), Pigeon Pea (Project: Rs. 17470/acre, Control: Rs.19083/acre, and Green gram (Project: Rs.12308/acre, Control: Rs. 13135/ acre).



Village Type	Crop Name	Soybean	Cotton	Pigeon Pea	Chickpea	Green Gram
Project	Responses	239	206	110	162	1
	Average of Working Capital (From Column N To U - Family labour = Working capital) Rs.	14017	18275	7571	13459	8620
	Average of COST A1 (Land preparation to Other charges+ Interest on working capital @6%+ Depreciation on fixed cost Rs.	15423	20025	8553	14934	9631
	Average of COST A2 (COST A1+ Rent paid for leased in land) Rs.	15423	20025	8553	14934	9631
	Average of COST B (Cost A2+Rental value of own land + Interest on owned fixed capital ) Rs.	20734	26930	17181	19706	12308
	Average of COST C (COST B+ Family labour) Rs. Total Coc / acre	21154	27865	17470	20011	12308
Control	Responses	110	121	52	90	1
	Average of Working Capital (From Column N To U - Family labour = Working capital) Rs.	15998	18280	8825	13769	9400
	Average of COST A1 (Land preparation to Other charges+ Interest on working capital @6%+ Depreciation on fixed cost Rs.	17528	20037	9887	15284	10458
	Average of COST A2 (COST A1+ Rent paid for leased in land) Rs.	17528	20037	9887	15284	10458
	Average of COST B (Cost A2+Rental value of own land + Interest on owned fixed capital ) Rs.	22883	27009	18594	20208	13135
	Average of COST C (COST B+ Family labour) Rs. Total Coc/ acre	23466	28145	19083	20669	13135

#### Table 12: Cost of cultivation of Major Crops

# Percentage Change in Cost of Cultivation

Percentage Change in Cost of Cultivation for major crops like Cotton, Soybean, Chickpea and Green Gram from CM-II to CM-VI in Project villages is highlighted in the table below.

Crop Name	Cotton	Soybean	Pigeon pea	Chickpea	Green Gram
CM-II	24993	18460	15921	20814	13482
CM-III Value (Rs.)	22956	18301	16339	19454	12483
CM-IV Value (Rs.)	22073	18935	15960	20068	10862
CM-V Value (Rs.)	23197	19428	15729	19253	10779
CM-VI Value (Rs.)	27865	21154	17470	20011	12308

Table 13: CoC from CM-II to CM-VI



Percentage of increase or decrease in COC from CM-II to CM-VI							
% Decrease/ increased in CoC (CM-II to CM-IV)	-11.68%	2.57%	0.24%	-3.58%	-19.43%		
% Decrease/ increased in CoC (CM-II to CM-V)	-7.2%	5.24%	-1.2%	-7.5%	-20.0%		
% Decrease/ increased in CoC (CM-IV to CM-V)	5.1%	2.6%	-0.4%	-4.1%	-0.8%		
% Decrease/ increased in CoC (CM-V to CM-VI)	20.12%	8.88%	11.07%	3.94%	14.18%		

Percentage Change in Cost of Cultivation for major crops like Cotton, Soybean, Pigeonpea, Chickpea and Green Gram from CM-II to CM-VI in project villages is highlighted in the table above. It was observed that the cost of cultivation for all the crops *viz.;* soybean, cotton, pigeon pea is increased and chickpea and green gram is decreased. This may be attributed to the significant hike in cost of seeds with heavy incidence of diseases and pests resulting in higher expenses incurred on sprayings for control which was observed in case of soybean and cotton. However, the probable reasons for the reduction in cost of cultivation in Project villages as compared to the control villages for all the other crops under study are mentioned below:

- Use of own seeds has increased considerably resulting in reducing the cost of cultivation, especially in soybean, green gram and chickpea in project villages as compared to control.
- Improved adoption of farm mechanization and improved farm implements at through Custom Hiring Centres (CHCs) and individual beneficiaries as part of the project has been a major factor in reducing labour cost. Farm machineries/implements as part of these CHCs under the project include tractor, rotavator, ploughs, cultivators, sowing machines, BBF planter, threshers, which helps in curtailing the labour requirement and thereby reduction in cost of cultivation in project villages as compared to control.
- Increased awareness among farmers about optimum use of chemical fertilizers through extension activities and FFS demonstrations has resulted in reduction in the excessive use of chemical fertilizers, thereby reducing costs in project villages to that of control.
- Promotion and use of biological and organic insecticides/pesticides viz.; neemark, panchamrut, pheromone traps, light traps under the project instead of extensive use of chemical pesticides. This has resulted in reducing repeated spraying and hence lowering down the expenses for control of pest and diseases in project villages as compared to control.



• Improvement in water use efficiency through use of protective irrigation through sprinkler systems, drip system, PVC pipes, motor pumps at farm level has resulted in reducing labour costs for irrigation purposes in project villages versus control.

# **Activities for Climate Resilient Agriculture Systems**

The PoCRA project has been designed to promote Climate Resilient Agriculture. As a part of Survey, we have collected data related to adoption of CR technologies, training received and benefits distribution to vulnerable sections as SC, ST, Women and Landless.

### Major Activities taken up

In Project area the highest proportion of beneficiaries availing DBT benefits in the project area was for the "Guest Farmer" category, with 28.66% of beneficiaries availing these benefits. This was followed by "Drip Irrigation" with 22.69% of beneficiaries, "Sprinkler Irrigation" with 19.70% of beneficiaries, and "Host Farmer" with 9.55% of beneficiaries. Other categories have relatively lower proportions of beneficiaries availing benefits, ranging from 2.69% to 1.49% for categories such as "Production of foundation & certified seeds of climate resilient varieties," "Backyard poultry," and "Farm Mechanization." The lowest proportion of beneficiaries availing benefits in the project area is for "Construction of Individual Farm Pond/farm pond lining" and "Recharge of open dug wells," both at 0.60%.





#### Figure 23: Applications of Beneficiaries

The highest proportion of beneficiaries availing DBT benefits in the control area was for the "Guest Farmer" category, with 27.71% of beneficiaries availing these benefits. This is followed by "Drip Irrigation" with 20.48% of beneficiaries, "Sprinkler Irrigation" with 18.67% of beneficiaries, and "Host Farmer" with 9.64% of beneficiaries. Categories such as "Farm Mechanization" and "Backyard poultry" have relatively higher proportions of beneficiaries availing benefits at 4.82% and 4.22%, respectively. The lowest proportion of beneficiaries availing benefits in the control area is for "Construction of Individual Farm Pond/farm pond lining" indicating no beneficiaries have availed this benefit, and "Recharge of open dug wells" at 0.60%.

Overall, the data suggests that the highest proportion of beneficiaries in both the project area and control area have availed benefits in categories such as "Guest Farmer," "Drip Irrigation," "Sprinkler Irrigation," and "Host Farmer." The proportion of beneficiaries availing benefits varies across different categories and is generally higher in the project area compared to the control area.



#### Trend in Proportionate Share of Different DBT Beneficiaries

The relative share from previous Survey is presented in the following chart. Increasing Trend (positive percentage change) was observed in Drip, Sprinkler irrigation, Backyard Poultry and Farm Mechanization. The percentage of farmers availing drip irrigation benefits increased from 18.2% in CM-IV to 21.5% in CM-V and further to 22.7% in CM-VI. This indicates a steady increase in the adoption of drip irrigation over time. The percentage of farmers availing sprinkler irrigation benefits increased from 13.1% in CM-IV to 17.3% in CM-V and further to 19.7% in CM-VI. Similar to drip irrigation, there is a consistent upward trend in the adoption of sprinkler irrigation. The percentage of people availing sprinkler irrigation has shown consistent growth over time. The percentage of farmers availing backyard poultry benefits increased from 0.0% in CM-IV to 1.2% in CM-V and further to 2.7% in CM-VI. This suggests a rising interest in backyard poultry farming. The percentage of farmers availing farm mechanization benefits increased from 0.9% in CM-IV to 1.2% in CM-V and further to 2.7% in CM-VI. There is a slight but steady increase in the adoption of farm mechanization. The percentage of people availing farm mechanization benefits increased from 0.9% in CM-IV to 1.2% in CM-V and further to 2.7% in CM-VI. There is a slight but steady increase in the adoption of farm mechanization. The percentage of people availing farm mechanization benefits has shown an upward trend.



Figure 24: Comparative Analysis from CM-IV to CM-VI Survey



While decreasing Trend (negative percentage change) was observed in Seed Production, Small ruminants, Water Pumps. The percentage of farmers availing seed production benefits decreased from 7.8% in CM-IV to 3.0% in CM-V and remained at 2.7% in CM-VI. There is a noticeable decline in the adoption of seed production. The percentage of farmers availing small ruminants' benefits decreased from 4.8% in CM-IV to 2.1% in CM-V and further to 1.2% in CM-VI. There is a declining trend in the utilization of small ruminants. The percentage of farmers availing water pump benefits decreased from 3.6% in CM-IV to 0.9% in CM-V and increased slightly to 1.2% in CM-VI. There is a fluctuation in the adoption of water pumps.

Fluctuating Trend (mixed percentage change) was observed in FFS Host Farmer Assistance, Apiculture, Individual Farm Pond, Polyhouse (Open vent), and Shade net house. They have shown no significant change in percentage over the surveys.

Peaks and Drops were observed in Horticultural Plantation and Composting. The percentage of farmers availing horticulture plantation benefits decreased from 2.4% in CM-IV to 6.3% in CM-V and decreased again to 1.5% in CM-VI. There is a significant fluctuation, with a higher adoption rate in CM-V. The percentage of farmers availing compost NADEP/ Vermi benefits decreased from 0.6% in CM-IV to 0.0% in CM-V and increased slightly to 1.8% in CM-VI. There is a fluctuation in the utilization of this benefit.

#### **Category wise DBT Applications**

The Category wise DBT applications represent the social categories of the beneficiaries. Out of the total 480 beneficiaries, 58.1% are from the Other Backward Class (OBC) category (in CM-V it was 61%), followed by General/Open category with 12.7% (about 11.5% in CM-V), Scheduled Tribes with 8.8% (in CM-V it was 7.5%, which is increase of more than 1% in this CM round), Nomadic Tribes with 7.7% (it was 5.2% in CM-V, showing major support to NT by over 2.5% than previous round), and whereas in case of Scheduled Castes it was about 7.5%, which just reduced to half from previous round of Survey (it was 13% in CM-V). The Other category accounted for 5.2% (it is increase from CM-V round, where it was only 2.1%) of the total beneficiaries. This data highlights the social diversity of the beneficiaries and the importance of considering social categories in project design and implementation. The project may need to adopt strategies that specifically target and address the needs and priorities of different social categories, taking into account their unique cultural, economic, and political contexts. The project may also need to address the historical and structural barriers that limit the participation and empowerment of marginalized social groups, such as Scheduled Castes and Scheduled Tribes, in agricultural activities and decision-making processes.





#### Figure 25: Category wise DBT Applications

Overall, the data underscores the importance of promoting social inclusion and equity in development interventions, and the need to adopt targeted strategies that address the specific needs and priorities of different social categories. By engaging with and empowering diverse social groups, the project may be able to create more sustainable and equitable outcomes for all beneficiaries.

#### **Trainings Received for CR Technologies**

The CM-VI Survey indicates a positive sign while going through the questions on trainings received on CR Technologies. In general, the project areas have received higher training percentages across all the agricultural practices compared to the control areas. The practices with the highest training percentages in the project areas were "Use of improved seed varieties" (69.30%), "Intercropping" (47.00%), and "Contour cultivation" (39.00%). The practices with the highest control areas percentages were "Use of improved seed varieties" (21.9%), "Intercropping" (12.1%), and "Contour cultivation" (8.6%). Apart from these, beneficiaries from Project areas had also gone through trainings on "Seed Treatment" (24%), "Integrated Nutrient Management" (8.7%) and "Implementation of BBF" (6.3%), with BBF being an important component for CRT promoted by the project. It was observed that respondents from Project Areas have shown much interest in Cultivation by BBF technology.





Figure 26: Trainings received on CR Technologies

# **Adoption of Climate Resilient Technologies**

It was observed that project beneficiaries had adopted various CR technologies since the inception of the project The most widely adopted technology in both areas was the use of improved seed varieties, with 66.3% of farmers in the project area and 33.2% of farmers in the control area using them. The second most widely adopted technology in both areas was intercropping, with 40.7% of farmers in the project area and 18% of farmers in the control area practicing it. The third most widely adopted technology in both areas was contour cultivation, with 33.7% of farmers in the project area and 13.7% of farmers in the project area doing it. The least adopted technologies in both areas were cultivation by broad bed furrow (BBF) method and canopy management in fruit crops, with only 0.7% of farmers in the project area and none in the control area using them. In general, the adoption rates of all technologies were higher in the project area than in the control area, indicating that the intervention or program had a positive impact on the adoption of climate resilient technologies by farmers.





#### Figure 27: Adoption of CR Technologies in last one year

To a question on whether the beneficiaries have benefitted from the climate resilient technologies which they have adopted, 176 (59%) beneficiaries reported positively and others reported the other way (not benefitted). The reasons stated for reporting 'not benefitted' include lack of technical knowledge, found difficult to apply in own field, non-availability of advanced agriculture machinery/ implements and so on.

Those who reported of benefitting from adoption of CR technologies include reduced cost of cultivation (86%), better control over pest and diseases (68%), soil and moisture conservation (44%), and improved soil fertility (35%). Other responses include improved germination rate, optimum use of pesticides and fertilizers and increased water availability.

Benefits reported by DBT beneficiaries by applying CR technologies						
Benefits of CR Technologies	Number	%				
Reduced cost of cultivation	152	86.4				
Better control over pest and diseases	120	68.2				
Soil and moisture conservation	77	43.8				
Improved soil fertility	61	34.7				
Improved germination rate	30	17.0				
Optimum use of pesticides and fertilizers	29	16.5				
Increased water availability	24	13.6				
Improvement in coping mechanism	11	6.3				
Number of valid Cases (multiple responses)	176	100.0				

Table 14: Benefits reported by DBT beneficiaries by applying CR technologies


Regarding cultivation by broad bed furrow (BBF) method, hardly 2 beneficiaries reported the method, and of them, only one found it useful.

# Feedback on Farmers' Field School Conducted

As part of Component A: As a part of PoCRA, Farmer Field School (FFS) was a major activity. FFS focuses on demonstration of climate-resilient varieties of field crops as well as of productivity-enhancing agronomic practices. As part of FFS, technical assistance was provided for technology transfer to farmers through demonstration, diffusion, and adoption at farm and village level.

# **Participation of Host Farmers**

For the assessment of farmer field school (FFS) activities, 32 host farmers (HF) at the rate of one per village, 64 male guest farmers (MGF) at the rate of 2 per village and 32 female guest farmers (FGF) at the rate of one per villages, were selected. In addition, under the DBT beneficiary category there were 9 FFS Host Farmer Assistance beneficiaries. As such, there are 137 FFS beneficiaries for our analysis. In Control Villages, there were 48 Guest farmers, 16 Host farmers and 2 FFS Host Farmer Assistance.

# Crop demonstrated on field as part of FFS

The host farmers and those who received FFS Host farmer Assistance were asked of the crops they demonstrated to the guest farmers under FFS. In Project areas, the major crops demonstrated were cotton, soybean and chickpea with or without intercropping (with another crop). While in Control Villages, the major crops demonstrated were Cotton, Chick Pea and Soybean.





Figure 28: Crops demonstrated in FFS in Project & Control Areas

To a question on the difference in the quality/cultivation of produce from demo and control plots, more than three-fourths (76%) felt that there were differences between the demo and control plots in terms of quality and quantity of produce.

The host farmers are supposed to receive some specified amount as honorarium. Accordingly, the HFs were asked a question as to whether they have received the specified honorarium and 68% of the host farmers admitted that they have received the honorarium and others said that they have not received any amount till date (at survey), including 3 HFs who said that it is in the process.

# **Participation of Guest Farmers**

As mentioned, 64 male and 32 female guest farmers were interviewed. As regards their participation in FFS, they were asked to report their regularity of attending FFS day school. In response to this question, only less than one-third (31%) of the Guest Farmers admitted that they were attending the day school all times and another 16 percent attended most of the times. Put together, not more than 50% of the Guest Farmers attended the day school regularly. It is important to note that as many as one-fourth of the Guest Farmers attended the day school either rarely or not at all attended.



Regularity of attending FFS day school	Number	Percent
All times	30	31.3
Most times	15	15.6
Some times	27	28.1
Rarely	19	19.8
Never attended	5	5.2
Total (GF)	96	100.0

#### Table 15: Regularity of attending FFS day school

### Motivation to participate in FFS as a host farmer

In Project areas out of a total of 140 respondents, the largest group (99 or 70.7%) indicated "Self Motivated," which suggests that they had joined the FFS voluntarily or without being convinced by anyone in particular, the figure was 48 or 73% in Control. With regard to the motivator, Agriculture Assistants were the most commonly cited (P: 21 or 15.0% and C: 12, 18.2%), followed by FFS Facilitators (P: 18 or 12.9%, C: 6, 9.1%). VCRMC members were the least commonly cited (2 or 1.4%) in Project Villages.

Overall, the data suggests that a significant proportion of host farmers may have joined the FFS without being specifically convinced by any particular person or group. However, among those who did cite a specific persuader, Agriculture Assistants were the most influential, which may have implications for future outreach and engagement efforts related to the FFS program.

### **Participating Seasons**

Referring to the last three years before the survey in January-February, 2023, the GFs were asked in which are the seasons they had participated in the FFS. It is to be noted that the reference period was set to 2020-21 Kharif season to 2022-23 Kharif season. In response to this, most of the GFs reportedly participated in the 2020-21 Kharif season (81%) followed by the 2020-21 Rabi season (24%). In the subsequent seasons their participation reduced to about 10 percent.

Seasons in which participated (Project)	Number	Percent
2020-21 Kharif	78	81.3
2020-21 Rabi	23	24.0
2021-22 Kharif	12	12.5
2021-22 Rabi	10	10.4
2022-23 Kharif	10	10.4
Total Number of GFs	96	100.0

Table 16: Seasons	in which	participated in	FFS in	Project Area



More or less the same trend was observed in Control Villages also, as per the below table, in 2020-21 Kharif the participation was 45 per cent and in 2020-21 Rabi, it was 17 per cent and so on.

Seasons in which participated (Control)	Number	Percent
2020-21 Kharif	37	45.10%
2020-21 Rabi	14	17.10%
2021-22 Kharif	15	18.30%
2021-22 Rabi	7	8.50%
2022-23 Kharif	8	9.80%
2022-23 Rabi	1	1.20%
Total Number of GFs	82	100.00%

Table 17: Seasons in which	participated in FFS	in Control Area
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### Technology on which training received in FFS

The Guest Farmers were asked of the technology topics on which training received in FFS. It was found in the CM-VI survey, that they have been demonstrated on the preparation of pesticide formulations & spraying (56%), spraying techniques with safety measures (55%) and Foliar application of 2% DAP (34%). Other technologies demonstrated include Seed treatment with bio-fertilizers, Irrigation by Drip/Sprinkler and crop residue management and so on, which are stated by a very few respondents (not listed in table).

Table 18: Technology on which training received in FFS

Technology on which training received in FFS	Number	Percent
Preparation of pesticide formulations & spraying	54	56.3
Spraying techniques with safety measures	53	55.2
Foliar application of 2% DAP	33	34.4
Seed treatment with bio-fertilizers	18	18.8
Irrigation by Drip/Sprinkler	13	13.5
Crop residue management	13	13.5
Total GFs (multiple responses)	96	100.0

The Guest Farmers were asked of the technologies adopted by them after the training. In response to this question, Spraying techniques with safety measures was reported by 45% of the respondents, followed by Preparation of pesticide formulations & spraying (42%) and Foliar application of 2% DAP (26%). About 12 to 14% of the respondents also reported of adopting Integrated Weed Management, Seed treatment with bio-fertilizers and Crop residue management. A number of technologies were also reportedly adopted by a few Guest Farmers. It is to be noted that some of these technologies might have been adopted by the farmers even before the training, and/or modified them after the training, which are not captured separately.



Table 19: Technologies adopted after FFS training

Technologies adopted after FFS training	Number	Percent
Spraying techniques with safety measures	43	44.8
Preparation of pesticide formulations & spraying	40	41.7
Foliar application of 2% DAP	25	26.0
Integrated Weed Management	13	13.5
Seed treatment with bio-fertilizers	11	11.5
Crop residue management	11	11.5
Not received any training	8	8.3
Bird perches (10/acre)	6	6.3
Seed treatment with fungicides	6	6.3
Cultivation by BBF	5	5.2
Irrigation by Drip/Sprinkler	5	5.2
Total GFs (multiple responses)	96	100.0
Note: Technologies adopted by less than 5 GFs excluded		

Other technologies that were found to be useful by the participants include cultivation by BBF, bird perches, seed treatment with bio-fertilizers, and irrigation by drip/sprinkler. It is important to note that the usefulness of these technologies may vary depending on the specific farming practices and conditions in the area.

The respondents were further asked to specify 3 most useful technologies they have adopted. The responses of the respondents indicate that Spraying techniques with safety measures (65%), Preparation of pesticide formulations & spraying (55%) and Foliar application of 2% DAP (41%) are the three most useful technologies the farmers have adopted.

Top 3 technologies found most useful	Total	Percent
Spraying techniques with safety measures	62	64.6
Preparation of pesticide formulations & spraying	53	55.2
Foliar application of 2% DAP	39	40.6
Cultivation by BBF	14	14.6
Bird perches (10/acre)	14	14.6
Seed treatment with bio-fertilizers	12	12.5
Irrigation by Drip/Sprinkler	9	9.4
Crop residue management	9	9.4
Integrated Weed Management	8	8.3
Seed treatment with fungicides	5	5.2
Intercropping	4	4.2
Total (multiple responses)	96	100.0

Table 20: Top 3 technologies found most useful

With respect to the crops demonstrated in the FFS, the major crops demonstrated are cotton, soybean and chickpea with or without intercropping (with another crop). The responses are in



line with the responses of the HFs. So, it is clear that cotton, soybean and chickpea are the only three crops given importance in the FFS.

Crops demonstrated in the FFS	Number	Percent
Cotton	42	43.8
Soybean	36	37.5
Chick Pea	17	17.7
Maize	4	4.2
Turmeric	2	2.1
Rabi Jowar	2	2.1
Onion	1	1.0
Cotton + Green Gram	1	1.0
Cotton + Black Gram	1	1.0
Cotton + Pigeon Pea	8	8.3
Soybean + Pigeon Pea	4	4.2
Number of GFs (multiple responses)	96	100.0

Table 21: Crops demonstrated in the FFS

The major reasons for the GFs for participating in the FFS were their interest in learning new technologies in agriculture (71%), to increase production and income (60%) and to reduce cost of production (*39%*).

Table 22: Key reasons for participation in FFS

Key reasons for participation in FFS	Number	Percent
Interested to learn new technologies in agriculture	68	70.8
To increase production and income	58	60.4
To reduce cost of production	37	38.5
Effective application of fertilizers and pesticides	9	9.4
To utilize water more effectively	4	4.2
No specific reason (suggested by officials/friends/family)	4	4.2
To save crop from climate variation	1	1.0
Total GFs (multiple responses)	96	100.0

The benefits derived by participating in FFS by the GFs are Awareness about good agriculture practices (78%), followed by Better awareness of use of inputs (fertilizers, seeds etc.) (47%) and Improvement in Soil health (25%). Some GFs are also reported benefits like less diseases in crops, conservation of soil moisture around the crop roots and so on.

Table 23: Benefits derived by participating in FFS

Benefits derived by participating in FFS	Number	Percent
Awareness about good agriculture practices	75	78.1
Better awareness of use of inputs (fertilizers, seeds etc.)	45	46.9
Improvement in Soil health	24	25.0
Less diseases in crops	17	17.7
Soil moisture was conserve around the crop roots	15	15.6
Better water management for agriculture	7	7.3



Total Guest Farmers (multiple responses)	96	100.0
Overall reduction in cost of production	3	3.1
Saving in seed input cost	4	4.2
Saving in fertilizer input cost	6	6.3
Increase in crop production or yield	7	7.3

# Findings from KII of FFS - Coordinator

### **Technical Coordinator Checklist Summary**

During the CM-VI Survey, we had interaction with Technical Coordinators of RoPA districts of Maharashtra. Overall, a total of 12 checklists were completed, with interactions conducted in Amravati District (3 checklists), Akola District (2 checklists), Buldhana District (4 checklists), Jalgaon District (1 checklist), Washim District (1 checklist), and Wardha District (1 checklist).

### Major responsibilities of Technical Coordinator

As part of the PoCRA project, the major responsibilities include:

- 1. Attending VCRMC meetings: Participating in the meetings and interacting with VCRMC members, Agricultural Assistants, Chartered Accountants (CAs), and Krush Tais to gather information on the progress of implementation and the challenges faced during the project period.
- Monitoring the adoption of Climate Resilient (CR) technologies: To assess the extent to which CR technologies had been adopted in the cluster/villages. To encourage and motivate farmers to increase their adoption of CR technologies, emphasizing the importance of climate resilience in agriculture.
- 3. **Providing technical guidance**: To offer technical guidance and support to the cluster team and farmers regarding various issues encountered during the implementation of the project. This assistance aims to address challenges and ensure effective implementation of CR technologies.
- 4. Developing technical pamphlets/brochures: To contribute to the preparation of technical pamphlets and brochures that serve as informative resources for disseminating and extending knowledge about CR technologies. These materials are designed to provide guidance and education to farmers and other stakeholders.
- 5. Conducting trainings: To organize and conduct training sessions for cluster team members, Self-Help Group (SHG) members, and Farmer Producer Company (FPC) members. These training programs focus on providing technical inputs and guidance on various issues related to CR technologies, helping participants enhance their understanding and skills in climate-resilient agriculture.



In summary, the major responsibilities for the PoCRA project include attending VCRM meetings, monitoring and promoting the adoption of CR technologies, providing technical guidance, contributing to the development of informational materials, and conducting training sessions to empower stakeholders in climate-resilient agriculture.

### **Specific Extension Activities**

The extension activities to incorporate in the extension plan for CR technology dissemination were:

- 1. **Organic farming:** Promoting and educating farmers about the principles and practices of organic farming, which involves minimizing the use of synthetic inputs and focusing on natural methods for pest and disease control.
- 2. **NADEP unit:** Encouraging the establishment and utilization of NADEP units, which are low-cost composting systems that produce high-quality organic manure.
- 3. Use of Neem Dashparni Ark: Promoting the use of Neem Dashparni Ark, a botanical pesticide prepared from a combination of neem and other medicinal plants, which helps control pests and diseases in an organic and sustainable manner.
- 4. **Broad Bed Furrow (BBF):** Introducing and promoting the use of Broad Bed Furrow, a farming technique that involves creating raised beds with furrows in between, allowing efficient water management and improved soil structure.
- 5. **Zero tillage techniques**: Advocating for the adoption of zero tillage techniques, which involve minimal or no soil disturbance during crop establishment, thus conserving soil moisture, improving soil health, and reducing erosion.
- 6. Use of organic and bio-fertilizers: Encouraging the use of organic and bio-fertilizers instead of or in combination with chemical fertilizers, promoting nutrient recycling and enhancing soil fertility in a sustainable manner.
- 7. Use of Pheromone Traps and IPM activities: Promoting the use of pheromone traps, a pest control method that utilizes synthetic pheromones to attract and trap specific insect pests, thereby reducing the reliance on chemical pesticides. Also, emphasizing the implementation of Integrated Pest Management (IPM) practices, which involve monitoring pests, employing biological control agents, and using cultural and mechanical methods to manage pests effectively.

### **Specific Sub-division wise Activities**

For the promotion and adoption of identified Climate Resilient (CR) technologies in specific sub-divisions, the following major activities and steps had been taken:

1. **Regular interactions/meetings:** Conducting regular interactions and meetings with various stakeholders, including Village Climate Resilient Mitigation Committees



(VCRMCs), Agricultural Assistants, Chartered Accountants (CAs), Krushi Tais, and farmers. These interactions aim to promote and increase the adoption of CR technologies by providing information, addressing queries, and discussing the benefits and challenges associated with their implementation.

2. Meetings with SHGs & FPCs: Organizing meetings with Self-Help Groups (SHGs) and Farmer Producer Companies (FPCs) to promote the adoption of CR technologies. These meetings serve as platforms to raise awareness, provide technical guidance, and facilitate discussions on the benefits and opportunities offered by CR technologies. The aim was to engage and empower these groups to adopt and implement CR technologies effectively.

In summary, the promotion and adoption of CR technologies in specific sub-divisions had involved regular interactions and meetings with VCRMCs, Agricultural Assistants, CAs, Krushi Tais, and farmers. Additionally, meetings had been conducted with SHGs and FPCs to raise awareness and provide technical guidance for the adoption of CR technologies

# CR technologies based on Farmers Requirements

Based on the response from farmers, the following climate resilient technology/technologies had been adopted in the project villages within the subdivision:

- Creation of Birds stoppage point: Farmers had adopted the practice of creating bird stoppage points to reduce insect populations in their fields. By providing designated areas where birds can feed, farmers attract birds that feed on insects, thereby helping to naturally control pest populations.
- Integrated Pest Management (IPM): Farmers had embraced the principles of Integrated Pest Management, which involves a holistic approach to pest control. They had been implementing various IPM strategies such as monitoring pests, using biological control agents, practicing cultural and mechanical methods, and minimizing the use of chemical pesticides.
- Use of Pheromone Traps: Farmers had adopted the use of pheromone traps, which are devices that utilize synthetic pheromones to attract and trap specific insect pests. This method helps reduce the reliance on chemical pesticides and enables farmers to manage pest populations effectively.

In summary, based on the farmers' response, the adopted climate resilient technologies in the project villages within the subdivision include the creation of bird stoppage points, implementation of Integrated Pest Management (IPM) practices, and the use of pheromone traps for pest control.



### Widely Adopted CR technologies from FFS

Based on the observations and feedback, the following Climate Resilient (CR) technologies demonstrated in Farmer Field Schools (FFS) had been found useful, widely adopted, and recommended for replication:

- Seed Treatment: The practice of seed treatment had been demonstrated in FFS. This
  involves treating seeds with appropriate treatments, such as fungicides or bio-control
  agents, to protect them from seed borne diseases and enhance their germination and
  early growth. Farmers had widely adopted this technology as it improves seed quality
  and overall crop performance.
- Rhizobium culture: The use of Rhizobium culture, a bacterial inoculant, had been demonstrated in FFS. Rhizobium forms a symbiotic relationship with leguminous crops and helps in nitrogen fixation, making it available for plant use. Farmers had recognized the benefits of using Rhizobium culture and had replicated its adoption in their fields.
- 3. **Application of Trichoderma:** The application of Trichoderma, a bio-control agent, had been demonstrated in FFS. Trichoderma helps in controlling soil-borne pathogens and promoting plant growth. Farmers had found this technology effective in managing plant diseases and had widely adopted its use.
- 4. **Use of Bio-fertilizers:** The use of bio-fertilizers, which are organic formulations containing beneficial microorganisms, had been demonstrated in FFS. Bio-fertilizers enhance soil fertility, nutrient availability, and plant growth. Farmers had recognized the value of bio-fertilizers and had incorporated their use into their farming practices.

In summary, the demonstrated CR technologies in FFS, including seed treatment, application of Rhizobium culture, application of Trichoderma, and use of bio-fertilizers, had been found useful, widely adopted, and should be replicated. These technologies had shown positive results in improving seed quality, nutrient availability, disease control, and overall crop productivity, making them valuable practices for farmers to adopt.

### **Contribution in preparation of pamphlets**

The Technical Coordinators had actively contributed to the preparation of pamphlets and brochures to disseminate climate-friendly technologies. Their involvement in this task had been valuable in promoting and spreading awareness about these technologies among farmers.

• The pamphlets and brochures serve as important communication tools, providing concise and accessible information on various climate-friendly technologies. By



disseminating these materials, the aim is to educate and inform farmers about the benefits and practical implementation of these technologies.

 The preparation of these pamphlets and brochures had proven helpful in the dissemination of climate-resilient (CR) technologies, ensuring that relevant information reaches the farmers. This approach facilitates knowledge transfer, enabling farmers to understand the potential advantages and challenges associated with adopting CR technologies.

In summary, the Technical Coordinators' involvement in the preparation of pamphlets and brochures on climate-friendly technologies had been instrumental in disseminating these technologies effectively, leading to increased awareness and adoption among farmers.

### Exposure visits conducted

A significant number of exposure visits had been conducted in the clusters/villages as part of the project. Generally, at least one or two exposure visits had been organized in most of the clusters/villages. These visits aim to provide farmers with first-hand experience and knowledge about climate-resilient (CR) technologies.

On average, around 10-15 farmers had benefitted from each exposure visit. These visits offer an opportunity for farmers to witness the successful implementation of CR technologies, learn from the experiences of other farmers, and gain practical insights into the adoption and benefits of these technologies.

It is anticipated that approximately 10% of the farmers who participated in the exposure visits will adopt CR technologies in the upcoming Kharif season. The exposure visits had been effective in creating awareness, building confidence, and generating interest among farmers to incorporate CR technologies into their farming practices.

In summary, a considerable number of exposure visits had been conducted, providing valuable learning experiences for farmers. The visits had benefitted an average of 10-15 farmers per visit, and it is expected that approximately 10% of these farmers will adopt CR technologies in the next Kharif season.

# **Trainings and workshops Conducted**

S. N.	Name	Taluka	District	Exposure visits conducted and total no. of farmers benefited
1.	Purushottam A. Kadu	Amravati	Amravati	Conducted one exposure visit at Sillod Taluka in Aurangabad district. Total 54 farmers had been benefitted in zero tillage techniques.

Table 24: Details of trainings & exposure visits conducted in the districts



2.	R. G. Harane	Achalpur	Amravati	Conducted two exposure visits at Sillod Taluka in Aurangabad district. Total 45 farmers had been benefitted in zero tillage techniques.
3.	Dipak M. Borkhade	Achalpur	Amravati	Conducted one exposure visit at Sillod & Phulumbri Taluka in Aurangabad district. Total 70 farmers had been benefitted in zero tillage techniques.
4.	Bharat B. Bhatkar	Murtizapur	Akola	None of the exposure visits had been conducted.
5.	Akshay C. Deshpande	Akot	Akola	Conducted two exposure visits of Mirzapur village farmers at Sillod & Kannad Taluka in Aurangabad district. Total 10 farmers had been benefitted in zero tillage techniques.
6.	Ravi B. Patil	Khamgaon & Shegaon	Buldhana	Conducted one exposure visit at Sillod Taluka in Aurangabad district. Total 70 farmers had been benefitted in zero tillage techniques.
7.	Prashant P. Dabbe	Buldhana	Buldhana	Conducted one exposure visit at Sillod & Kannad Taluka in Aurangabad district. Total 65 farmers had been benefitted in zero tillage techniques.
8.	Mahesh B. Jadhav	Nandura, Jalgaon Jamod & Sangrampur	Buldhana	Conducted one exposure visit at Sillod in Aurangabad district. Total 25 farmers had been benefitted in zero tillage techniques.
9.	Amol M. Kolhe	Mehkar	Buldhana	Conducted one exposure visit at Sillod in Aurangabad district. Total 25 farmers had been benefitted in zero tillage techniques.
10.	S. S. Gujrathi	Amalner	Jalgaon	Conducted one exposure visit at Sillod in Aurangabad district. Total 150 farmers had been benefitted in zero tillage techniques.
11.	Nilesh R. Junghare	Wardha	Wardha	None of the exposure visits had been conducted.
12.	Dnyaneshwar V. Tayde	Washim	Washim	One exposure visit was conducted, about 30 farmers had been benefitted.

### Frequency of meeting with Agri-Assistants

Regular meetings are held with the Agricultural Assistant, Cluster Assistants (CA), Krushi Tais and Krushi Mitra to gather progress updates on extension work and the adoption of climateresilient (CR) technologies. These meetings occur on a 15-day or monthly basis.

The purpose of these interactions is to stay updated on the extension activities being carried out and to assess the level of adoption of CR technologies. By meeting with the Agricultural Assistant and other relevant stakeholders, valuable information is obtained regarding the progress, challenges, and successes of the extension work.

These frequent meetings provide an opportunity to discuss the implementation status of CR technologies, address any issues or concerns that arise, and track the overall progress of the extension efforts. By maintaining regular communication and collaboration with the



Agricultural Assistant and other key individuals, the project ensures a coordinated approach towards promoting and monitoring the adoption of CR technologies.

In summary, regular interactions with the Agricultural Assistant, CA, *Krushi Tais*, and *Krushi Mitra* take place every 15 days or on a monthly basis to gather updates on extension work and the adoption of CR technologies. These meetings facilitate effective communication, progress assessment, and addressing challenges to ensure the successful implementation of CR technologies.

### **Frequency of Village Visits**

Visits to the villages are conducted regularly to monitor the progress of technology adopted by the farmers. These visits occur either on a weekly basis or every 15 days.

The purpose of these visits is to assess and evaluate the implementation of the adopted technologies by the farmers. By visiting the villages, project representatives can directly observe the application of climate-resilient (CR) technologies, identify any challenges or issues faced by the farmers, and provide necessary guidance and support.

The regularity of these visits ensures timely monitoring and enables prompt intervention if needed. It allows for a close and continuous assessment of the progress made by the farmers in adopting and implementing CR technologies.

In summary, visits to the villages are conducted either on a weekly basis or every 15 days to monitor the progress of technology adopted by the farmers. These visits facilitate real-time observation, assessment, and support to ensure the effective implementation of CR technologies.

# Method of dissemination of information

The dissemination of weather information and crop advisories is carried out with the guidance of Agricultural Assistants. The following methods are employed to ensure farmers receive the necessary information:

- Direct visits: Information regarding weather updates and crop advisories is directly disseminated to farmers during regular visits. This allows for face-to-face communication and provides an opportunity for farmers to ask questions and seek clarifications.
- WhatsApp messages: Crop advisories are shared with farmers through WhatsApp messages. Agricultural Assistants play a crucial role in this process by assisting in the distribution of these messages. WhatsApp serves as an efficient platform for quick and widespread communication, enabling farmers to receive timely updates and relevant crop-related guidance.



By leveraging both personal visits and digital communication channels like WhatsApp, the project ensures that farmers had access to important weather information and crop advisories. This facilitates informed decision-making, helps mitigate risks, and supports farmers in adopting appropriate agricultural practices.

In summary, weather information and crop advisories are disseminated to farmers during visits, allowing for direct communication. Additionally, WhatsApp messages are utilized with the assistance of Agricultural Assistants to efficiently share crop-related guidance. These methods enable farmers to stay informed and make informed decisions regarding their farming activities.

### List of CR technologies adopted

The list of climate-resilient (CR) technologies adopted and found to be beneficial to farmers in the previous and present seasons includes the following:

### For Non-Kharpan villages:

- 1. **Organic farming and NADEP unit:** Adoption of organic farming practices and the use of NADEP units had been beneficial to farmers. These practices promote sustainable agriculture and improve soil health.
- 2. **Use of biofertilizers:** Farmers had benefited from the application of biofertilizers, which enhance nutrient availability and improve crop productivity.
- 3. *Nimboli* and *Dashaparni Ark*: The use of botanical extracts like Nimboli (Neem) and Dashaparni Ark had provided effective pest control solutions for farmers.
- 4. Use of pheromone traps: Pheromone traps had been effective in pest management, reducing insect populations and protecting crops.
- 5. **Broad Bed Furrow (BBF):** BBF technique, which involves creating broad beds and furrows, had shown positive results in water management and crop productivity.
- 6. **Zero tillage techniques:** Zero tillage practices, which minimize soil disturbance, had been adopted. However, farmers had shown limited interest in their adoption.
- 7. **Plantations:** Plantation activities, such as tree planting and agroforestry, had been beneficial in improving land quality, biodiversity, and environmental sustainability.

### For *Kharpan* villages:

- 1. **Gypsum application:** The use of gypsum, which helps improve soil structure and water infiltration, had been found beneficial in kharpan villages.
- 2. **BBF:** Broad Bed Furrow (BBF) technique had shown positive results in water management and crop productivity in kharpan villages as well.



3. **Farm Ponds and NRM activities:** Farm ponds and other Natural Resource Management (NRM) activities had proven beneficial for farmers in the kharpan area.

In summary, a range of CR technologies, including organic farming, NADEP units, bio fertilizers, botanical extracts, pheromone traps, BBF, zero tillage techniques, and plantations, had been found beneficial to farmers in general villages. In kharpan villages specifically, gypsum application, BBF, farm ponds, and NRM activities had been beneficial. However, farmers had shown less interest in adopting BBF and zero tillage techniques overall.

# **Progress Meetings**

The progress on the adoption of CR technologies and the challenges faced are regularly presented at district-level monthly meetings in all the districts. These meetings foster effective communication, coordination, and support among stakeholders, contributing to the successful implementation of CR technologies.

Specific feedback and suggestions were received from farmers regarding the adoption of climate-resilient (CR) technologies. Here is the summary:

- **Collection of observations and feedback**: One plot was selected where farmers adopted CR technologies, and their observations and feedback were collected. This approach provided valuable insights into the effectiveness and challenges faced during the implementation of CR technologies.
- Visit benefits: Farmers found the visits to be beneficial. These visits likely provided an opportunity for farmers to directly interact with project representatives, share their experiences, and provide feedback on the adoption of CR technologies.
- Feedback on Broad Bed Furrow (BBF): Farmers who adopted BBF provided feedback and shared a challenge they faced. They highlighted that during the implementation of BBF, there was a significant displacement of soil from one place to another, which they suggested should be minimized. This feedback indicates the importance of considering practical challenges and finding solutions to ensure effective implementation of CR technologies.

In summary, feedback and suggestions were gathered through the selection of one plot for observation and feedback collection. Farmers found the visits to be beneficial, and feedback related to BBF highlighted the need to address challenges and minimize soil displacement during its implementation. This feedback and input from farmers are valuable for refining and improving the adoption of CR technologies.

# Suggestions for Emergency Crop Plan

Based on experience, the following specific suggestions are provided to *Krishi Vigyan Kendras* and Sub Divisional Agriculture Officers for preparing an Emergency Crop Plan:



**Consider crop suitability:** The Emergency Crop Plan should take into account the types of crops grown in the area. Factors such as soil type, slope, and water availability should be considered to determine which crops are most suitable for the region.

**Assess water availability:** The plan should consider the ground water level and the water requirements for both domestic and irrigation purposes. This information is crucial for determining the feasibility of different crop options and planning water management strategies. **Analyse climatic conditions:** Emphasis should be given to analysing the climatic conditions of the region. The rainfall patterns of the last three years should be studied to understand the variability and trends. This information can help in selecting appropriate crops and developing strategies to mitigate the impact of climatic fluctuations.

By considering these factors and conducting a comprehensive analysis of crop suitability, water availability, and climatic conditions, the Emergency Crop Plan can be tailored to the specific needs and challenges of the region. This will enable farmers to make informed decisions and take proactive measures to address any emergency situations related to crop production.

In summary, the suggestions provided for preparing an Emergency Crop Plan include considering crop suitability based on soil, slope, and water availability, as well as analysing the climatic conditions and rainfall patterns of the region. These suggestions aim to enhance preparedness and resilience in managing emergencies related to crop production.

### Findings from KII of FFS - Facilitator

During the CM-VI Survey, interactions were conducted with FFS facilitators. In total, interactions with FFS facilitators were conducted in three districts, namely Buldhana, Jalgaon, and Wardha. Three checklists were completed during these interactions.

### **Role in implementation of FFS**

In the implementation of Farmer Field Schools (FFS), the role includes various responsibilities and tasks. Here is a summary of the role:

- Planning and coordination: The role involves planning the FFS activities, including selecting suitable locations and informing farmers in advance about the FFS sessions. The aim is to encourage the participation of both male and female farmers in the FFS.
- 2. **Organizing FFS sessions:** The role includes organizing the FFS sessions, which involve conducting various demonstrations and activities at the farmers' fields. These demonstrations provide practical exposure to climate-resilient technologies and showcase their benefits to the farmers.
- 3. **Information dissemination:** The role involves delivering information on climateresilient technologies to the farmers. This includes sharing knowledge on specific crop



practices, emphasizing organic farming, zero tillage techniques, and sustainable farming methods. The aim is to create awareness and provide guidance to the farmers regarding the adoption of these technologies.

4. **Facilitation and interaction:** The role includes facilitating interactions among the participating farmers. This creates a platform for sharing experiences, exchanging ideas, and learning from each other. It also involves motivating the farmers to adopt climate-resilient technologies and reduce the cost of cultivation for their crops.

By actively fulfilling these responsibilities, the role contributes to the successful implementation of FFS. It ensures that farmers receive the necessary information, support, and encouragement to adopt climate-resilient technologies and enhance their agricultural practices.

# CR technologies demonstrated to farmers

Through Farmer Field Schools (FFS), various climate-resilient technologies are being demonstrated to farmers. Here is a summary of the technologies and the response received during the demonstration sessions:

- 1. **Seed treatment and seed production:** The importance of seed treatment and quality seed production is demonstrated to farmers. This helps them understand the benefits of using treated and improved seeds for better crop yields.
- Neem ark (Liquid) and micro-nutrients: The use of Neem ark, which is a liquid extract from Neem leaves, and the application of micro-nutrients are demonstrated. These techniques promote organic farming and provide essential nutrients to crops for healthier growth.
- 3. **Pheromone traps:** The use of pheromone traps is demonstrated to farmers. These traps help in controlling pest populations by attracting and trapping insects using synthetic sex pheromones. This method reduces the reliance on chemical pesticides.
- 4. Organic farming and NADEP unit: The principles and practices of organic farming, including the use of organic fertilizers and the implementation of NADEP units, are demonstrated. These techniques promote sustainable and environmentally friendly agriculture.
- Zero tillage techniques and BBF technology: The benefits and implementation of zero tillage techniques and Broad Bed Furrow (BBF) technology are demonstrated. These practices help in conserving soil moisture, reducing soil erosion, and improving water and nutrient management.

The response from farmers during the demonstration sessions had been encouraging. While not all farmers may had adopted the demonstrated technologies, the average response had



been positive. Some farmers had shown interest and adopted the demonstrated practices, indicating their willingness to explore and implement climate-resilient technologies. This suggests that the FFS sessions are effectively creating awareness and generating interest among farmers to adopt these techniques for improved agricultural practices.

#### Strategies to mobilize Guest farmers

To mobilize and inform guest farmers about the farm field demonstration sessions, the following processes and strategies had been adopted:

- Submission of FFS conduction plan: The FFS conduction plan is submitted to the Sub Divisional Agriculture Officer (SDAO) office for approval. Once the plan is approved, the implementation process begins.
- **Prior intimation to stakeholders:** Prior intimation is sent to various stakeholders, including the host farmer, *Krushi Tai* (female agricultural worker), *Krushi Mitra* (agricultural assistant), Village Climate Resilient Mitigation Committee (VCRMC) members, *Sarpanch* (village head), and women members. This ensures that relevant individuals and groups are informed about the upcoming FFS session.
- Instruction to *Krushi Tai* and *Krushi Mitra:* The *Krushi Tai* and *Krushi Mitra* are instructed to inform guest farmers about attending the FFS. It is expected that around 20-25 farmers will attend the session.

Among these practices, the most effective one to mobilize guest farmers is the demonstration of new technologies and the sharing of solutions for current problems faced by the farmers. By showcasing the benefits and practical applications of climate-resilient technologies, and by providing solutions to the challenges faced by farmers, the demonstration sessions generate interest and motivate guest farmers to attend. This approach helps them understand the relevance and potential advantages of adopting these technologies in their own farming practices, thus increasing their participation and engagement in the FFS.

### Key reasons of low participation of guest farmers

The low participation of guest farmers in demonstration sessions can be attributed to the following key reasons:

 Crop season and engagement in field operations: Farmers are often busy with their ongoing crop season and field activities, which may limit their availability to attend demonstration sessions. The timing of the sessions may not align with their agricultural schedules, leading to low participation.

To address the challenge of low farmer turnout in the demonstration sessions, the following solutions can be implemented:



- 1. **Instruction and motivation**: The Cluster Assistant (CA) and Krushi Tai play a crucial role in instructing and motivating farmers to attend the FFS. By emphasizing the importance and potential benefits of participating in the sessions, farmers can be encouraged to prioritize their attendance despite their busy schedules.
- 2. **Proper intimation and communication:** It is essential to ensure that farmers receive proper intimation and communication about the arrangements for the FFS. The CA and Krushi Tai can effectively communicate the date, time, and location of the sessions to farmers. This can be done through personal visits, phone calls, or other means of direct communication.

By addressing these challenges and implementing appropriate solutions, such as providing clear instructions, motivation, and effective communication, the participation of guest farmers in demonstration sessions can be increased. This would enhance their exposure to climate-resilient technologies and improve their understanding and adoption of these practices in their farming operations.

# **Exclusive FFS for Women farmers**

Based on the given information, the following points can be summarized:

- Exclusive FFS sessions for women farmers: No exclusive FFS sessions for women farmers were conducted in the village.
- **Participation and response of women farmers:** The participation of women farmers in FFS sessions had been a significant challenge. The response of women farmers in these sessions is not specifically mentioned.
- Efforts to motivate women farmers: The cluster team and Krushi Tai have made attempts to motivate women farmers and women members of the Village Climate Resilient Mitigation Committee (VCRMC) to participate in the FFS sessions.

Overall, the lack of exclusive FFS sessions for women farmers and the challenge of ensuring their participation in regular FFS sessions had been reported. While efforts had been made to motivate women farmers and women VCRMC members to participate, the specific outcomes or success of these efforts are not provided in the given response.

# Farmers Motivation on Global Warming

Based on the provided information, the following points can be summarized:

1. **Farmer's awareness:** Farmers had some level of awareness about the climate change or global warming phenomenon. However, they may require additional motivation to adopt climate resilient technologies.



- 2. **Impact of climate change:** Farmers had witnessed the impact of climate change on their farmland. They had experienced heavy damage and reduced crop yields due to untimely and high-intensity rainfall. Additionally, crops had suffered from insect and pest attacks.
- 3. Adaptation measures: In response to these challenges, farmers had decided to take certain actions. They plan to do plantations on bunds (embankments) and pasture land, which can help mitigate the impact of climate change.

Overall, farmers are aware of climate change, had witnessed its effects on their farmland, and are taking some steps to adapt and mitigate the challenges posed by changing climatic conditions.

### Traditional Techniques to cope with Adverse Climate

Based on the provided information, the following points can be summarized:

- Traditional techniques: Farmers had employed certain traditional techniques to cope with the adverse climate impact on farming. These techniques include the ridge and furrow method, sowing across the slope, seed treatment, and the use of Pheromone Traps.
- 2. Willingness to adopt new technologies: Farmers had shown a willingness to adopt new climate resilient farming technologies that had been promoted by the PoCRA project. Specifically, based on the demonstrations conducted in FFS, farmers are interested in adopting organic farming, Neem and *Dashparni Ark* (Liquid), Integrated Pest Management (IPM), and Natural Resource Management (NRM) activities.

Overall, farmers had utilized traditional techniques to mitigate the effects of adverse climate conditions on their farming practices. Moreover, they are open to adopting new climate resilient farming technologies as demonstrated in the FFS sessions, indicating their willingness to embrace innovative approaches to address climate challenges.

### Other CR Technologies Adopted by Farmers

Based on the provided information, the following points can be summarized:

- Widely adopted technologies: Farmers had widely adopted environment-friendly climate resilient technologies such as Integrated Pest Management (IPM), Integrated Nutrient Management (INM), Pheromone Traps, and the use of Neem and Dashparni Ark. These technologies had been demonstrated through the Farmer Field Schools (FFS) and had proven to be impactful and affordable for the farmers.
- 2. **Technologies not widely adopted:** On the other hand, farmers had not widely adopted Broad Bed Furrow (BBF) and Zero Tillage techniques. These technologies



require specific farm machineries which are not easily available to farmers specially the rental services provided at village level and low response of farmers towards zero tillage.

- 3. **Reasons for adoption and non-adoption:** The adoption of the widely adopted technologies can be attributed to their effectiveness in managing pests and diseases, improving nutrient management, and providing a cost-effective solution for farmers with reduction in cost of production. In the case of non-adoption of BBF and Zero Tillage techniques, specific farm machineries which are not easily available to farmers as discussed earlier.
- 4. Women-specific preferred technologies and challenges: The provided information does not specify any women-specific preferred technologies or challenges in adoption. However, it is worth noting that the participation and adoption of climate resilient technologies by women farmers may be influenced by factors such as access to resources, knowledge dissemination, and social and cultural norms.

Overall, farmers had shown a preference for adopting environment-friendly climate resilient technologies such as IPM, INM, and the use of Pheromone Traps. However, the adoption of certain technologies like BBF and Zero Tillage techniques had been limited, possibly due to land constraints and perceived challenges. Further efforts may be needed to address these challenges and promote the adoption of these technologies, including targeted interventions and awareness campaigns specifically tailored to the needs and circumstances of women farmers.

# Feedback on the difference in yield

Based on the provided information, the following points can be summarized:

- 1. **Difference in yield:** The demonstration plots, where the climate resilient technologies were implemented, had shown an increase in yield of up to 1 quintal per acre compared to the control plots. This indicates that the adoption of climate resilient technologies has had a positive impact on improving crop productivity.
- 2. Factors contributing to the difference: The observed difference in yield can be attributed to the implementation of climate resilient technologies in the demonstration plots. These technologies, such as improved seed treatment, integrated pest management, nutrient management, and other practices, had likely contributed to better crop health, reduced pest and disease incidence, improved nutrient availability, and overall improved management practices. These factors had collectively resulted in increased yield in the demonstration plots compared to the control plots.



It is important to note that the control plots were maintained by the farmers following their regular practices, which may not had incorporated the climate resilient technologies. This highlights the significance of adopting and implementing these technologies to achieve improved crop yields and overall agricultural productivity.

### **Quality and effectiveness of the FFS**

Based on the provided information, the following points can be summarized:

- 1. **Quality and effectiveness of FFS sessions:** The FFS sessions conducted under PoCRA had been deemed effective and impactful. However, there is room for improvement to enhance their quality and effectiveness further.
- 2. **Qualified and experienced personnel:** It is suggested that well-qualified and experienced individuals be assigned to conduct the FFS sessions in the respective regions. This can contribute to better delivery of information and guidance to the farmers, ultimately improving the overall quality and effectiveness of the sessions.
- 3. **Crop-specific sessions:** To address the current issues faced by farmers during the growing period, it is recommended to organize demonstration and classroom sessions that are tailored to specific crops and their respective crop cycles. This targeted approach can provide more relevant and timely information, assisting farmers in addressing their immediate challenges.
- 4. Informative and innovative topics: The selection of crops and topics for the FFS sessions should be informative and innovative. This can create a positive learning environment among farmers, keeping them engaged and interested in adopting new technologies and practices.
- 5. **Training materials and information brochures:** Providing farmers with necessary training materials and informative brochures about new technologies in farming can enhance their understanding and adoption of these practices. These resources can serve as valuable references and reminders for farmers as they implement the recommended techniques.

By implementing these suggestions, the quality and effectiveness of FFS sessions can be improved, leading to better dissemination of knowledge and increased adoption of climate resilient technologies among farmers.

### **Awareness on Organic Farming**

Based on the information provided, the following points can be summarized:



- 1. Awareness of organic farming: Approximately 50% of the farmers in the village are well aware of organic farming and its advantages. They had knowledge about the concept and benefits associated with organic farming practices.
- Adoption of organic farming techniques: Some farmers in the village had already started practicing organic farming to some extent. Specifically, they had been using Neem ark (liquid) and Pheromone Traps in their fields, indicating their willingness to adopt organic farming methods.
- 3. Interest based on landholding: It has been observed that small landholders in the village had shown less interest in adopting organic farming practices. On the other hand, farmers with larger landholdings, typically ranging from 5 to 7 acres or more, had expressed a greater willingness to adopt organic farming techniques, albeit in certain specific plots.

Overall, while there is a considerable level of awareness about organic farming among the farmers in the village, the actual adoption of organic farming practices varies. Larger landholders appear to be more inclined to undertake organic farming, while smaller landholders may require further motivation or support to embrace these practices.

### **Role of Social Media**

Based on the information provided, the following points can be summarized:

- 1. **Phone usage and familiarity:** Farmers in the area are primarily using phones and are familiar with receiving messages. This indicates that mobile phones are a widely accessible and commonly used communication tool among farmers.
- 2. **Smartphone usage**: Some farmers in the area also had smartphones, which opens up the possibility of utilizing smartphone applications and platforms for communication and awareness-building purposes.
- 3. **Preferred social media platforms:** WhatsApp and YouTube are mentioned as platforms that farmers are familiar with. These platforms can be effective in disseminating information and raising awareness about environmentally friendly actions due to their popularity and ease of use.

In summary, based on the farmers' phone usage and familiarity with messaging, as well as the availability of smartphones among some farmers, utilizing WhatsApp and YouTube would be suitable social media platforms for making farmers more aware of environmental-friendly actions.

### Awareness on banned pesticides

Based on the provided information, the following points can be summarized:



- Awareness of banned pesticides: Most farmers in the village are well aware of banned pesticides, indicating that they had knowledge about the pesticides that are prohibited for use.
- Information dissemination: Cluster team members, Agricultural Assistants, and Agricultural Supervisors had played an active role in providing information about banned pesticides to the farmers. They had ensured that farmers receive timely updates and are informed about the restricted use of certain pesticides.
- **Communication channels:** Information about banned pesticides has been shared with farmers through mobile messages, indicating that mobile communication is utilized as an effective channel to disseminate such important information.

In summary, farmers in the village are generally aware of banned pesticides, and the cluster team, Agricultural Assistants, and Agricultural Supervisors had taken the responsibility to inform farmers about these banned substances. Mobile messaging had been utilized as a means to communicate and raise awareness among farmers regarding the restricted use of certain pesticides.

### Efforts for reducing the production cost

Based on the provided information, the following points can be summarized:

- Demonstrations in FFS: Various technologies had been demonstrated in the Farmer Field Schools (FFS) to reduce the production cost of farmers. These include zero tillage techniques, NADEP and organic units, Integrated Pest Management (IPM), Integrated Nutrient Management (INM), and the use of bio-fertilizers and organic fertilizers.
- 2. Promotion of low-cost technologies: Efforts had been made to encourage farmers to adopt low-cost technologies like use of own seed, soil test based optimum application of in-organic fertilizers and limiting the use of insecticides/pesticides only during the economic injury level of insects and pests attack and use of other organic inputs. Farmers had been advised to embrace these technologies in order to reduce their production costs. By adopting these cost-effective practices, farmers can optimize their expenditure and improve their profitability.

In summary, special efforts had been made to reduce the production cost of farmers through FFS demonstrations and the promotion of low-cost technologies. By showcasing and encouraging the adoption of these practices, farmers can achieve cost savings and improve their overall financial sustainability.



### Information needed from agro-met advisory services

Based on the provided information, the following points can be summarized:

- Information needed by farmers from agro-met advisory services: Farmers express the need for receiving agro-met advisory on a prior basis. This means they require timely and advance information related to weather conditions and forecasts. By having access to this information, farmers can plan their agricultural activities, from sowing to harvesting, accordingly. Additionally, farmers also desire agro-met advisory services to provide information on market situations, rates, and weather updates and real time contingency measures as per the prevailing climatic conditions.
- Suggestions for improving agro-met advisory services: To further enhance the agro-met advisory services provided by PMU PoCRA, the following suggestions can be considered:
- Ensure timely delivery: The advisory services should prioritize providing information well in advance, allowing farmers to make informed decisions and plan their farming activities accordingly.
- **Comprehensive coverage:** Apart from weather-related information, the advisory services should also include updates on market situations and rates. This would enable farmers to have a holistic understanding of the agricultural landscape.
- Use user-friendly platforms: Employ user-friendly platforms or channels for disseminating the agro-met advisory, such as mobile applications or SMS services, making it easily accessible and understandable for farmers.

In summary, farmers require agro-met advisory services that provide timely information, allowing them to plan their agricultural activities. To improve these services, it is suggested to include comprehensive information on market situations and rates, and ensure the use of user-friendly platforms for effective dissemination.

### Farmers follow-up on agro-met advisory services

In the opinion of the respondents, approximately 50-60% of farmers follow the advice provided by the agro-met advisory services offered by PMU PoCRA.

# Challenges in Kharpan villages

In *Kharpan* villages, farmers face various challenges including the hardening of soil due to heavy rainfall, saline groundwater unsuitable for crops, and the need for proper land preparation and drainage. The following suggestions are given to farmers in Kharpan villages:

- 1. Conduct soil and water testing.
- 2. Apply gypsum to address soil issues.



- 3. Ensure proper land preparation and drainage.
- 4. Prefer newly released biotic and abiotic stress tolerant rainfed varieties of crops.
- 5. Prepare a proper plan for the Rabi season.
- 6. Only use life saving irrigations through micro irrigation like sprinkler/drip in critical situations to save crops.

### FFS related recommendations by Expert

- Weather forecasting including weather parameters such as rainfall, wind-speed, temperature, humidity may be provided to farmers so that the farmers can prepare themselves on real time basis to cope up with different biotic and abiotic stresses.
- For late onset of monsoon, drought and prolonged dry spell mitigation strategies needs to be demonstrated on the field of host farmers.
- Use of cultural, biological and mechanical with an integrated management approach and application of inorganic pesticides only when infestation was above economic threshold level needs to be demonstrated.
- Fields of host farmers should be reachable to the farmers of the village where farmers can easily access.
- Timings of field schools should be early in morning or late evenings so that most of the farmers can avail the benefits and attend.
- Demonstrations on preparation of compost, vermi-compost should be encouraged at host farmers for effective recycling of farm wastes and sustainable soil health e.g. PDKV Compost method, NADEP compost, etc.
- Literature in form of leaflets, folders, bulletins and booklets as regards improved cultivation practices and strategies to cope up with climate vulnerability and pest disease management should be provided during FFS.
- Need to create an awareness among the women farmers about the participation and importance of FFS conducted to encourage the women participants.



### **DBT Mechanism under PoCRA**

As part of the project, to transfer the approved grants directly to the Aadhaar linked bank account of the beneficiary, PoCRA had adopted the Direct Benefit Transfer (DBT) mechanism. Under this functionality, beneficiary register himself on the DBT portal of PoCRA through his Aadhaar number and apply for the available activities from the platform. Total 207 (64 pre sanctioned & 143 subsidy paid) DBT beneficiaries were surveyed as part of CM-VI.

Each application under DBT are processed through the approval mechanism after which payment is processed through Aadhaar Based Payment System (ABPS) which gets directly credited to the Aadhaar linked bank account of the beneficiary. DBT process is highlighted in the figure below (Source: PMU).





Responses received from beneficiary survey on DBT activities are discussed below.

# **Individual DBT Benefits**

For the Concurrent Monitoring VI Survey of DBT beneficiaries, a sample of 143 beneficiaries who received subsidy (matching grant) and 64 beneficiaries who received pre-sanction. For this purpose, a list of beneficiaries in the selected 32 villages was provided by the PMU. It is to be noted that, as per the direction of the PMU, a beneficiary was considered for only one benefit (even if applied for and/or received subsidy for more than one benefit). In the next step, the list was sorted by type of benefit and the required sample was selected by applying



systematic random sampling method. As such the sample may not be considered as a representative sample but it would throw some light on the broad nature of the benefits.

DBT benefits applied by Farmers (as per sample selection)			
DBT benefit Applied for	Number	%	
Drip irrigation	76	36.7	
Sprinkler Saline and Sodic lands (Farm ponds/ Sprinklers / Water pump)	66	31.9	
Seed Production / Production of seeds of climate resilient varieties	9	4.3	
Backyard poultry	9	4.3	
Farm Mechanization	9	4.3	
FFS Host Farmer Assistance/Agronomic practices FFS	9	4.3	
Horticulture Plantation/Plantation of Horticulture Crops	5	2.4	
Water pumps	4	1.9	
Small ruminants	4	1.9	
Pipes	3	1.4	
NADEP Compost Unit Organic Input production unit	3	1.4	
Vermicompost	3	1.4	
Apiculture	3	1.4	
Farm pond/Farm Pond lining	2	1.0	
Recharge of open dug wells	2	1.0	
Valid cases (multiple responses)	207	100.0	

Table 25: DBT benefits applied by the farmers (as per sample selection)

As the table indicates drip and sprinkler were the most common benefit (each around onethird) the farmers have applied for. Some of the other less common benefit the farmers have applied for were seed Production / Production of foundation & certified seeds of climate resilient varieties, Backyard poultry, Farm Mechanization (Tractor Power Tiller Power Weeder Roto-cultivator Seed cum Fertilizer Drill), FFS Host Farmer Assistance/Agronomic practices FFS, Horticulture Plantation/Plantation of Horticulture Crops. Though there are a basket of about 30 different types of benefits provided under the PoCRA project, other benefits are rarely in demand among the farmers. This needs some attention.

Table 26: Status of the benefits applied for survey as perceived by the beneficiaries

Status of the benefits applied for survey as perceived by the beneficiaries			
The status of application	Number	Percent	
Transfer of matching grant to the beneficiary bank account	131	63.3	
Desk -3 - Approval and pre-sanction by SDAO	38	18.4	



Work under implementation & document submission by beneficiary	13	6.3
Desk -5 – Account officer	8	3.9
Desk -6- SDAO	8	3.9
Work implemented by the beneficiary	3	1.4
Demand by beneficiary for matching grant	3	1.4
Application for matching grant through DBT mobile application	1	0.5
Verification of application by Cluster Assistant	1	0.5
Desk -1 - Approval by VCRMC committee	1	0.5
Total	207	100.0

With respect the status of application at survey as perceived by the applicants, as many as 63 percent of the beneficiaries reported that they have received the matching grant as against the 69 percent who are expected to have received the matching grant as per sample selection. On the other hand, 18 percent of the beneficiaries have received pre-sanction but not started any work and others are at various stages of the work including a few who have submitted all documents and waiting for the matching grant. The key reasons for not starting the work include not having money to invest on this activity, having other expenditure priorities and lack of community support. However, more than 75% of them are interested to complete the work.

To a question on how the beneficiaries have applied for the benefit, 40% reportedly applied for the activity by themselves or with the help of family members. 28% of the respondents took the help of cluster assistants to apply for the activity, 12% applied with the help of e-sewa Kendra and another 12 applied with the help of government officials.

How applied for the activity?	Total	Percent
Self /family members	82	39.6
With help of cluster assistant	57	27.5
With help of e-sewa Kendra	25	12.1
With help of VCRMC member	21	10.1
With help of friends/neighbours	15	7.2
With help of Gram Panchayat operator/ members	7	3.4
Total	207	100.0

Furthermore, 10 of the respondents applied for the activity with the help of VCRMC members, while 7% applied with the help of friends or neighbours and another 3.4% of the respondents applied with the help of Gram Panchayat operator/members. Overall, the majority of the



respondents applied for the activity by themselves or with the help of their family members, followed by Cluster Assistants and e-sewa Kendra.

To a question "Do you think the timeline for completing the activity or creating the asset is sufficient?", almost 90% replied that the timeline was sufficient and for only 10% the timeline was not sufficient. To another question "Are you facing or did you face any challenge in accessing the project benefits?", more than 90% of the beneficiaries said that they did not face any problem in accessing the benefit. Likewise, to a question "Did you incur any cost (apart from the cost incurred on implementing the activity) in accessing the project benefits?", more than 90% said "No".

This suggests that majority of the beneficiaries were satisfied with the project timeline, accessibility and cost-effectiveness. The project was well-designed and implemented to meet the needs and expectations of the beneficiaries. Only a small fraction of the beneficiaries faced some challenges or costs in accessing the project benefits, which could be addressed by further improving the project delivery and communication.

Reasons for applying for the benefit	Number	%
Help to increase water supply for Agriculture	132	63.8
Help to increase my agriculture production and hence my income	132	63.8
These practices are climate friendly	50	24.2
Subsidy is received quickly	39	18.8
Process of Application is Simple	20	9.7
No specific reason, was suggested by my friends/family	14	6.8
Others	3	1.4
Number of cases (multiple responses)	207	100.0

The two most common reasons reported by participants were "It will help to increase water supply for Agriculture" and "It will help to increase my agriculture production and hence my income", each accounted for 34% of the total responses. The other common reason reported by the participants was: These practices are climate-friendly (24%), some participants (19%) reported that they applied for the benefit because the subsidy is received quickly. A few beneficiaries also reported a few other reasons (see table).

The beneficiaries were asked "Who all motivated to apply for the benefit" and in response to this question, 58 percent of the beneficiaries said that they have applied of their own without the motivation of anybody else. At the same time, Cluster assistant, Agricultural assistant and VCRMC members were named by ach 16 to 26 percent of the beneficiaries. On the other



hand, Friends or neighbours, FFS Facilitator/Coordinator, Krushi Tai, Gram panchayat members, etc. were very rarely mentioned as motivators for availing the benefit (see table).

Who all motivated to apply for the benefit	Number	Percent
Self	119	57.5
Cluster Assistant	53	25.6
Agricultural Assistant	35	16.9
VCRMC members	33	15.9
Family members of the household	16	7.7
Friends or neighbours	11	5.3
FFS Facilitator/Coordinator	9	4.3
Krushi Tai	3	1.4
Gram panchayat members	1	0.5
Number of cases	207	100.0

Table 29: Motivation to apply for the benefit

For a question "How did you arrange money to purchase/construct this asset?" more than 90 said that they have used their own funds for the construction/purchase of the asset. Others said that they took loan from friends or family members/neighbours extended help in this matter (5%), or took loan from money lender (table not shown).

### **Seed Production**

Seed production is an important intervention in PoCRA and about 4.3% beneficiaries from Project area availed this benefit under DBT. Seed production in climate resilient agriculture represents the foundation upon which agricultural systems can thrive amidst the mounting environmental pressures. Climate resilient seed production not only fosters agricultural stability but also serves as a powerful tool for climate change mitigation and adaptation. By selecting and disseminating seeds that efficiently sequester carbon dioxide, improve soil health, and conserve water resources, seed production becomes an integral part of sustainable farming practices. These climate-adaptive seeds contribute to carbon sequestration, thus aiding in the fight against global warming while ensuring the long-term viability of agricultural landscapes.

This intervention of seed production was availed by 9 beneficiaries in Project areas and 4 from Control areas. It was observed that in CM-VI survey, climate resilient seed production was carried out in Chickpea (P:22%, C: 25%), Soybean (P: 27%, C: 50%), while Pigeon pea was grown in Control areas (25%) only.





Figure 30: Crops for Seed Production

# Source of Purchased Seed

The CM-VI survey data indicated that the main source of purchase for seed was Farmer Producer Company, with a total of 8 out of 9 purchases, representing 88.9% of the total. The remaining 1 purchase, representing 11.1% of the total, was made from Mahabeej. While in case of Control area the survey data indicates that Mahabeej was the sole source of purchase of seeds.

This indicates that the beneficiaries or group responsible for seed purchase prefers to buy seeds from Farmer Producer Companies, which could be due to factors such as lower prices, better quality, or closer proximity. However, it was also important to note that Mahabeej was still being used as a source for seed purchase, which suggests that it may still have some advantages or benefits that are valued by the organization.

Overall, this information is useful for understanding the seed purchase preferences and strategies of the organization or group, which can help in optimizing seed procurement processes and ensuring a reliable and sustainable supply of seeds for crop production.

# **Training for Seed Production**

The data shows that out of the 9 individuals surveyed, only 1 beneficiary received training for seed production, representing 11.1% of the total. The remaining 8 Project beneficiaries did not receive any training, representing 88.9% of the total. While in case of Control 1 beneficiary received the training out of 4.

This indicates that the majority of the individual beneficiaries responsible for seed production did not receive any training specifically for seed production, which could potentially have an impact on the quality and quantity of the seed produced. It is possible that the organization or



group responsible for seed production may want to consider investing in training programs or workshops to ensure that individuals have the necessary skills and knowledge for producing high-quality seeds.

However, it is important to note that the sample size was small, and more information would be needed to fully assess the impact of training on seed production.

# Production of climate resilient seed

When enquired about if the seed produced are climate resilient or not, it was found that out of the 9 individuals surveyed, 8 individuals believed that the seed production was climate resilient, representing 88.9% of the total. Only 1 individual answered "Don't Know", representing 11.1% of the total. While in case of Control areas all the 4 beneficiaries replied they were producing climate resilient seeds. This suggests that the majority of the individuals responsible for seed production believe that the seeds produced are resilient to climate conditions, indicating that efforts may have been made to select or develop seeds that are adapted to local environmental conditions. However, it is important to note that the perception of climate resilience may not always align with actual performance in the field, and further monitoring and evaluation may be needed to assess the resilience of the seeds produced.

Overall, this information is useful for understanding the perceptions of individuals responsible for seed production regarding climate resilience, which can help in identifying areas of strength and potential areas for improvement in seed production practices.

### Market for Selling of agriculture produce from Seed Production

The data shows that out of the 9 individuals surveyed, all 9 individuals reported that they are able to sell their agricultural produce from seed production activity easily, representing 100% of the total.

This indicates that the individual or group of farmers responsible for seed production has a reliable market for their agricultural produce, which could be due to factors such as high demand or effective marketing strategies. Additionally, the ability to sell agricultural produce easily can help ensure the financial sustainability of the seed production activity and encourage continued investment and improvement in seed production practices.

Overall, this information is useful for understanding the market dynamics and potential profitability of seed production activities, which can help in making informed decisions regarding resource allocation and future investments.

We also enquired about the main organization with which they have tie-up to sell their seeds, out of the 9 individuals surveyed, 8 individuals reported that the main organization they are tied up with FPCs to sell seeds, representing 88.9% of the total. The remaining 1 individual



reported being tied up with Mahabeej, representing 11.1% of the total. While in case of Control areas, 50% sell their products to Mahabeej and rest to others, may be to local farmers or traders.



Figure 31: Tie-up to sell the Product

This suggests that the majority of the individuals responsible for seed production have established a partnership or tie-up with Farmer Producer Companies to sell their seeds, indicating that these companies may offer favourable terms or a reliable market for seed sales. However, it is also important to note that Mahabeej is still being used as a seed selling partner, which suggests that there may be benefits or advantages to working with multiple organizations.

Overall, this information is useful for understanding the seed selling partnerships and strategies of the organization or group responsible for seed production, which can help in optimizing seed sales processes and ensuring a reliable and sustainable market for seed sales.

# Benefits from seed production activity

To a question on the benefits from seed production activities, from the set of multiple answers 9 reported an increase in income, which represents 45% of the total respondents. This suggests that seed production activity can be a profitable business and can provide a significant financial benefit to farmers or entrepreneurs.





Figure 32: Benefits from seed production activity

The second most reported benefit was the increased availability of climate resilient seed for cultivation, which was reported by 6 participants (30%). This is a significant benefit because it suggests that seed production can help farmers adapt to climate change by providing them with seed varieties that are better suited to changing weather patterns.

Two participants (10%) reported that seed production activity has supported them in strengthening their seed production business. This suggests that seed production activity can provide technical support and knowledge to farmers or entrepreneurs, helping them to improve their seed production practices and ultimately improve their business performance.

Another two participants (10%) reported that seed production activity has given them access to quality seed. This is an important benefit because access to quality seed can increase crop yields and quality, which can ultimately lead to increased income.

Finally, one participant (5%) reported that there were more financial benefits to growing seed crops than growing regular crops. This suggests that seed production can be more profitable than other types of crops, which may encourage more farmers to consider seed production as a viable business opportunity.

Overall, the analysis suggests that seed production activity can provide a range of benefits, including increased income, access to quality seed, and support in strengthening seed production businesses. Additionally, it can help farmers adapt to climate change by providing them with more resilient seed varieties.

# **Horticultural Plantation**

As climate change continues to pose unprecedented challenges, it is becoming increasingly evident that a paradigm shift in agriculture is necessary. Emphasizing the importance of



horticultural plantation in climate resilience agriculture represents a transformative approach that offers multifaceted benefits to farmers and the environment. Horticultural plantation, encompassing a diverse array of fruits and herbs, presents a compelling case for its integration into climate resilience agriculture. These plantations exhibit a remarkable ability to adapt to varying environmental conditions, exhibiting resilience to heat, drought, floods, and even certain pests and diseases. By harnessing the unique attributes of horticultural crops, farmers can diversify their production systems, reducing their reliance on a single crop and thereby mitigating the risks associated with climate-induced crop failures.

As per data from CM-VI survey it was found that 5 beneficiary from Project and 3 from Control area had availed this benefit. As a part of questionnaire it was asked which horticulture crop the beneficiaries have planted. The response from 5 beneficiaries from Project areas, indicated that 3 of the beneficiaries had planted custard apple (60% of respondents), 1 planted sweet lime (20% of respondents), and 1 planted lime (20% of respondents).



Figure 33: Horticultural Crops Planted

The CM-VI data suggests that custard apple is the most commonly planted horticultural crop among the beneficiaries in Project area, while Guava being preferred in Control areas, followed by sweet lime and lime.

It is important to note that horticultural crops can provide significant economic benefits to farmers and contribute to the local economy. Therefore, identifying the most suitable crops for the region and providing farmers with the necessary resources and training can help to maximize the benefits of horticulture crop cultivation.

Moreover, diversifying horticulture crop production can also be beneficial in terms of reducing the risk of crop failure due to disease, pest attacks, or adverse weather conditions. Thus, it


may be useful to explore other horticulture crops that can be grown in the region and encourage farmers to diversify their crops for a more resilient agricultural system.

It was asked which was their main source to purchase seedlings for the horticultural crops, out of the 5 respondents from Project areas, 3 purchased their seedlings from a government nursery (60% of respondents) and 2 purchased from a government-approved nursery (40% of respondents). While all the 3 beneficiaries from Control had purchased seedlings from government nurseries.

This suggests that the majority of the respondents prefer to purchase seedlings from government nurseries. It may be because government nurseries are perceived to provide quality seedlings and have the necessary certification and accreditation.

However, it is important to note that relying solely on one source for seedlings may not be sustainable in the long term, as it can increase the risk of disease and pest infestations. Therefore, it may be useful to encourage farmers to explore other sources of seedlings and to ensure that all sources are reliable and provide quality seedlings.

Moreover, promoting the establishment of private nurseries can also help to increase the availability of seedlings in the region and provide farmers with more choices. This can ultimately contribute to the development of a more sustainable and diversified agricultural system.

### Installation of drip in horticultural plantation

All the respondent beneficiaries from Project and Control areas had installed drip irrigation (100% of respondents). This indicates that drip irrigation is a popular and commonly used irrigation method among the respondents. Drip irrigation is a water-efficient irrigation method that can save up to 50% of water compared to traditional irrigation methods such as flood irrigation. Additionally, it can improve crop yield and quality, reduce weed growth, and lower the incidence of plant diseases.

The adoption of drip irrigation by all respondents suggests that they are aware of the benefits of this irrigation method and are willing to invest in it to improve their crop production. It also indicates that there may be awareness-raising campaigns or Project interventions in the region promoting the use of drip irrigation.

Overall, the high adoption rate of drip irrigation is a positive sign that farmers in the region are willing to adopt water-saving and efficient irrigation methods, which can lead to more sustainable and profitable agricultural practices.



### Crops grown before and after horticultural plantation

It was asked about the crop grown before horticultural plantations, out of 5 respondents from Project area, 3 reported that they did not grow any crop before the benefit of horticultural plantation (60% of respondents). One respondent reported growing cotton (20% of respondents), and another respondent reported growing soybean (20% of respondents).

The survey data suggest that a significant proportion of the respondents were not engaged in crop cultivation before the adoption of horticultural plantation. This may indicate that the adoption of horticultural plantation has provided a new and alternative source of income for farmers in the region.

It is important to note that diversifying crop production can help to increase the resilience of agricultural systems and provide farmers with more options to cope with changes in climate and market conditions. Therefore, encouraging the adoption of horticultural crops can be a positive step towards the development of a more diversified and sustainable agricultural system.

When enquired about which major crop the beneficiaries were growing after availing the benefit, out of 5 respondents from Project area, 2 reported growing soybean as a major crop after the benefit of horticultural plantation (40% of respondents). Two respondents reported not growing any major crop (40% of respondents), and one respondent reported growing pigeon pea (20% of respondents).

The data suggest that soybean is the most commonly grown major crop after the adoption of horticultural plantation. This may be due to the fact that soybean is a popular and widely grown crop in the region, and it can be grown alongside horticultural crops.

It is also worth noting that two respondents reported not growing any major crop after the adoption of horticultural plantation. This may indicate that horticultural crops are being grown as a complementary source of income rather than as the sole source of income for farmers.

Overall, the results suggest that the adoption of horticultural plantation has provided farmers with more options for crop diversification and income generation. The data also suggest that soybean is a popular crop choice among farmers in the region, and there may be opportunities to further promote the adoption of other horticultural crops in the future.

#### Success Story: Horticultural Activity Dhamani village

Sh. Kiran Arun Sawant is a young and hardworking farmer from Dhamani village in Karanja Lad tehsil of Washim district, Maharashtra. He lives with his family of four members and owns 1.82 hectares of land. He has a well for irrigation, which he fills with water from the Dhamani Minor Pond through an underground pipeline that he laid at his own cost. Traditionally he has



being growing cotton, soybean and pigeon pea in the kharif season and wheat and gram in the rabi season. He came to know about the PoCRA project from the community assistant and the agriculture assistant. He decided to apply for guava and custard apple plantation under the horticulture component of the project.



Figure 34: Farmer displaying PoCRA interventions

It was on 3rd October 2021, Kiran submitted his application for guava plantation and received pre-sanction on 17 February 2022 after verification by the agriculture assistant. He planted 1333 plants of Pink Taiwan variety of guava (more than one year old seedlings) in 0.80 hectares with a spacing of 3m x 1.5m. He bought these plants from a nursery in Gaywal, Washim at a cost of Rs. 50 per plant. He also installed a drip irrigation system for the guava plantation. The total cost of purchasing, transporting, planting, spraying, intercultural operations and drip irrigation for the guava plants and for intercrop cultivation was about Rs. 3,54,104. He received a subsidy of Rs. 1,03,514 from the PoCRA project, which was delayed due to a land document issue, that he resolved later.

Kiran harvested 900 carats of guava (around 198 quintals) in 2022-23. He sold his produce to a local agent at a rate of Rs. 15 per kg and earned a total income of Rs. 2,97,000 from the guava plantation. He also grew soybean and cotton as intercrops in the guava plantation and earned Rs. 1,30,000 from them. He incurred an expense of Rs. 50,000 for the intercrop cultivation.





Figure 35: Discussion with Experts

Kiran made a net profit of Rs. 1,76,510 from the guava plantation in one year. He expects to earn more income in the coming years as the plants grow and produce more fruits. He has created a secure and long-term source of income for himself and his family from the guava plantation.

Agricultural operations/task	Expenses (Rs.) for Guava	Income generated (Rs.)	
-	Plantations		
Seedlings Cost	66,650/-	Production of Guava	2,97,000/-
Digging of Trenches	1,15,320/-	Intercrops	1,30,000/-
Plantation & refilling	15,000/-	Subsidy (received)	1,03514/-
Drip Installation	68,234/-		
Gap Filling	22,040/-		
Spraying & Intercultural	12,000/-		
operations			
After Care Activities	2,660/-		
Transportation	2,200/-		
Intercrops	50,000/-		
Total Investments	3,54,104/-	Income generated	5,30,514/-

Table 30: Expenses and Income generated from Guava plantation

Kiran was very satisfied with the performance of the guava plantation and thanks the PoCRA project for its support and guidance. He says that he was making more profit from guava than from traditional crops. He has also planted 850 plants of custard apple in another plot under the PoCRA project in 2020 and hopes to harvest them from next year. Kiran serves as an example of a successful farmer who has adopted innovative and diversified farming practices with the help of the PoCRA project. He has improved his livelihood and income by growing high value crops like guava and custard apple.



# Comments from Hydrology Expert

Visiting the farm of Sh. Kiran Arun Sawant was very encouraging and it reflected a clear vision of implementing of PoCRA interventions in his farm of 2.16 hectares.

**Guava Plantation:** He has planted guava in 0.8 hectare. 1500 No plants are planted in high density. Spacing of guava plants has been kept 5' x 10'.

**Plantation of Custard Apple (Sita Phal):** The farmer has planted custard apple in 1.0 hectare. The spacing of the plants has been kept 7' 6" x 16', whereas normally it is kept 20' x 20'.

**Sowing Soybean as Intercrop:** Farmer had sown soybean as the first crop in kharif as an intercrop. In Rabi, he has sown grams in 3 acre and wheat in one acre.

Drip Irrigation: The farmer has adopted drip irrigation for the guava and custard apple plantation.

Open Dugwell: There is a dugwell in the farm. It is 25' in diameter and 52' deep.

**Well Recharge Structure:** The farmer has dug two pits along the slope to arrest rainwater. These pits have been filled with filter material (Boulder/gravel/sand) and are connected to the dugwell through PVC pipes. In rainy season water flows along the slope and seeps into the pits near the dugwell and filtered water enters into dugwell through the connecting pipes.

**PVC Pipes from River:** The farmer has laid pipes of length 2100 m to carry water from the river flowing close to the village. He pumps the water from the river to carry it to the dugwell through the pipes.

**Lateral Boreholes:** The farmer has got drilled four number lateral boreholes 70' in length into the ground from which water is tapped from the ground. On the day of visit one borehole was active from which ground water was coming into the dugwell. With the provision of these measures, water is available to the farmer all the year.

**Installation of Solar Power:** The farmer had installed solar power. As the electric power is available during night, water is pumped from river into the dugwell during night. On the following days, watering is given to the crop / plantation from the dugwell with pumps driven by solar power during the daytime.

**Utilization of Subsidy under PoCRA Project:** The farmer has taken subsidy for Motor Pump, Drip Irrigation set, recharge structure and Horticulture from the PoCRA project. He had bought PVC pipes from own resources and taken solar power from KUSUM scheme. With the adoption of above, the farmer has ensured availability of water and power.



# Success Story: Horticulture Plantation Mhaispur village

Shivdas Tukaram Dighore is a 61-year-old farmer from Mhaispur village in Akola district, Maharashtra. He lives with his family of four members and owns 1.61 hectares of land. He has a bore well and a farm pond for irrigation purposes. He has an ITI electrical diploma and worked in the private sector for 20 years. Five years ago, he decided to start cultivating his own land with innovation and experimentation. Traditionally he used to grow cotton, soybean and pigeon pea in the *Kharif* season and gram in the *Rabi* season.



Figure 36: Farmer interview on horticultural plantation

Shivdas learned about the PoCRA project through other farmers, community assistants and agriculture assistants. He decided to apply for guava plantation under the horticulture component of the project. He submitted his application on 21 February 2019 and received presanction on 8 March 2019 after verification by the agriculture assistant. Shivdas purchased 520 plants of L-49 variety of guava (one year old seedlings) at a cost of Rs. 50 per plant from the government nursery in Buldhana. He planted them in 0.78 hectares with a spacing of 3m x 2m. He also installed a drip irrigation system for the guava plantation. He spent Rs. 1,58,000 on purchasing, transporting, planting and installing drip irrigation for the guava plants. He incurred a total expense of Rs. 2,98,600 in two years for the guava plantation. He received a subsidy of Rs. 1,47,506 from the PoCRA project in three instalments.



Agricultural Operations/ Other Expenses	Expenses (Rs.) for Guava Plantations			
	2019-20	2020-21	Total	
Seedlings Cost	26,000	0	26,000	
Transportation	3,000	0	3,000	
Tranches Digging & Refilling	4,000	0	4,000	
Drip Installation	1,25,000	0	1,25,000	
Organic Fertilizer	6,000	6,500	12,500	
Spraying	6,000	6,000	12,000	
Intercultural Operations	4,000	5,000	9,000	
Pruning	3,200	3,200	6,400	
Caretaker Expenses	7,000	7,500	14,500	
Transportation during sale	1,200	0	1,200	
Intercrops	40,000	45,000	85,000	
Total	2,25,400	73,200	2,98,600	

Table 31: Expenses and Income generated from Horticultural plantation

Shivdas harvested 12 quintals of guava in 2021-22 and 40 quintals in 2022-23. He sold his produce in the local market at a rate of Rs. 15 per kg and earned a total income of Rs. 78,000 from the guava plantation in two years. He also earned Rs. 1,74,500 from intercrops grown along with the guava plants. He made a net profit of Rs. 1,01,406 from the guava plantation in two years. He expects to earn more income from the third year onwards as the plants mature and yield more fruits. He has created a sustainable source of income for himself and his family for the next 10-15 years from the guava plantation.



Figure 37: Expert visit in Horticulture plantation with intercropping



Particulars	Income generated (2020-21 & 2021-22) (Rs.)
	Guava
Production	78,000/-
Subsidy	1,47,506/-
Intercrops	1,74,500/-
Total	4,00006/-

Table 32: Income generated from Guava plantation from 2021-22

Beneficiary was very happy with the results of the guava plantation and appreciates the support and guidance provided by the PoCRA project. He said that he was earning more profit from guava than from traditional crops. He had also planted 312 plants of custard apple in another plot in 2020 and expects to harvest them from next year.

He serves as an example of a successful farmer who has adopted innovative and diversified farming practices with the help of the PoCRA project. He has improved his livelihood and income by growing high value crops like guava and custard apple and also generated employment for other people of the village.

Beyond their inherent adaptability, horticultural plantations can actively contribute to climate change mitigation efforts. These crops sequester carbon dioxide during their growth, thus playing a role in offsetting greenhouse gas emissions. Moreover, horticultural systems generally demand less land and water compared to traditional monocultures, making them environmentally friendly choices that help preserve critical resources for the future. Additionally, horticultural plantations often encourage sustainable farming practices such as agroforestry and intercropping, fostering synergy between different plant species that enhance soil health, increase nutrient cycling, and minimize soil erosion. The improved soil structure and health of these systems aid in water retention, reducing vulnerability to both drought and heavy rainfall events.



# A3: Promoting efficient and sustainable use of water for agriculture

The component focuses on activities to enhance security by maximizing the use of surface water for agriculture, managing groundwater resources in a sustainable manner, retaining and enhancing soil moisture and enhancing water use efficiency and water productivity. Feedback of beneficiaries had been obtained on irrigation status, activities under DBT to enhance water security, community and NRM activities.

# **Existence of Source of irrigation**

The data collected from CM-VI survey indicates that out of 308 project household respondents, 306 or 99% reported having a source of irrigation on the land that they cultivate. Additionally, only 2 households or 0.1% reported not having a source of irrigation. While in Control 96.4% had their own source of irrigation.

Source of Irrigation	Project Area	Percent	Control Area	Percent
Yes	306	99.35%	159	96.40%
No	2	0.65%	6	3.60%
Total	308	100.00%	165	100.00%

Table 33: Existence of Source of Irrigation

The high percentage of households with a source of irrigation suggests that water availability and irrigation infrastructure may be relatively good in this community. Having a reliable source of irrigation can increase crop yields and allow for a more diverse range of crops to be grown throughout the year.

# Sources of irrigation

As a part of the questionnaire it was asked to the beneficiaries about their sources of irrigation to cultivate their land. It was recorded that the most common source was the dug well, (P:67.7%, C:79%) reporting using this method. The second most common source was a borewell (P: 23.0%, C:16%) reporting using this method. Only a small percentage of households reported using other sources of irrigation, such as a canal, river, farm pond, earthen dam/check dam, or other specified sources.

Sources of irrigation used to cultivate the land	Total	Project Percent	Control Total	Control Percent
Dug well	218	67.70%	127	78.88%
Borewell	74	23.00%	25	15.53%
Canal	10	3.10%	1	0.62%
River	10	3.10%	2	1.24%

Table 34: Source of irrigation used to cultivate the land



Farm Pond	5	1.60%	1	0.62%
Earthen dam/Check dams	4	1.20%	1	0.62%
Other	1	0.30%	4	2.48%
	322		161	

The prevalence of dug wells and borewells as the main sources of irrigation suggests that groundwater may be a primary water resource for agricultural production in this community. It was worth noting that the overuse of groundwater can have negative environmental and economic consequences, such as depletion of aquifers and increased costs for drilling deeper wells. The relatively small number of households using other sources of irrigation may suggest that these sources may be less reliable or accessible in the community, or that they may be less suitable for the types of crops grown in the area.

# **Drip irrigation**

Of the 76 beneficiaries of drip irrigation in the sample, 49 beneficiaries have reportedly completed the activity (installed it in their farms) and started using it. These beneficiaries were asked a series of questions and their responses are analyzed below.

To a question "How frequently do you use this asset?" the project beneficiaries reported that they used the drip set only when it was required (P: 69.4%, C: 45.5%). Others said either the use was seasonal or regularly.



#### Figure 38: Frequency of use of Drip Irrigation

The drip-set beneficiaries are asked a question as to what crops are grown in drip area before and after the benefit. In response to this question, more than two-thirds of the beneficiaries were cultivating cotton in the drip area before and after the benefit. In general, there is no substantial differences in the crop cultivation before and after the benefit.



Crops cultivated before and after the benefit (Drip-set)				
Сгор	Before		After	
	Number	Percent	Number	Percent
Cotton	20	69.0	28	65.1
Pigeon pea	0	0.0	1	2.3
Soybean	1	3.4	1	2.3
Chickpea	1	3.4	4	9.3
Maize	2	6.9	3	7.0
Wheat	1	3.4	2	4.7
Turmeric	0	0.0	1	2.3
Other	4	13.8	3	7.0
Total *	29	100.0	43	100.0
Note: *Cases for whom information available				

Table 35: Crops cultivated before and after the benefit (Drip-set)

Almost three-fourths of the drip beneficiaries felt that water consumption and wastage on agriculture has reduced after adoption of drip irrigation. To a question on how they have benefitted from drip irrigation, as many as 92 percent said that their income has increased. The other major responses are Increase in production (43%) and Increased availability in water for protected irrigation (31%). On the other hand, as we have seen earlier, only 16 percent of the beneficiaries reported that there was a change in the cropping pattern.

Table 36: Benefits of using Drip Irrigation

Benefits of Using Drip Irrigation	Number	Percent
Increase in income	45	91.8
Increase in production	21	42.9
Increased availability in water for protected irrigation	15	30.6
Change in cropping pattern	8	16.3
Availability of water during dry spells	3	6.1
Efficient use of water	4	8.2
Increase in quality of agriculture produce	3	6.1
Increase in area of cultivation during Kharif Season	1	2.0
Increased water availability for Rabi season	1	2.0
Saving in fertilizer use and cost	2	4.1



Saving in labour cost	4	8.2
Number of cases	49	100.0

# Frequency of the use of the Asset

Based on the given data, it appears that the majority (60.9%) of respondents use drip irrigation only on requirement, which suggests that they do not use drip irrigation on a regular basis, but rather as needed based on their water requirements. This may be due to factors such as the availability of water, rainfall patterns, or the specific crop being grown.

A significant minority of respondents from project area (P: 34.4%, C:30%) reported using drip irrigation on a seasonal basis, which suggests that they use drip irrigation regularly during certain periods of the year, such as the dry season or during specific crop stages. This could be an effective strategy for managing water use and maximizing crop yields during critical periods.

A small number of respondents (3.1%) reported that they are not currently using drip irrigation, while only 1.6% reported using it regularly. These results suggest that there may be opportunities to increase the adoption of drip irrigation among farmers in the region.

Overall, the data suggests that the use of drip irrigation is somewhat variable among respondents, with the majority using it only on requirement. This may reflect local conditions or specific farming practices, and further research could be conducted to understand the factors influencing the frequency of drip irrigation use among farmers.

With regard to question on facing any difficulties in taking the benefit of this activity, it appears that a majority (95.3%) of respondents did not report any difficulties in taking the benefit of using a sprinkler system. This suggests that the use of sprinkler systems for irrigation may be a relatively straightforward and accessible technology for farmers in the region.

However, a small number of respondents (4.7%) did report difficulties in taking the benefit of this activity. Without further information, it is unclear what specific difficulties these respondents encountered. It is possible that they experienced technical issues with the sprinkler system, faced challenges in adapting their farming practices to use the new technology effectively, or encountered other barriers to accessing and utilizing the system.

# **Sprinkler System**

This activity ranked second and availed by 64 beneficiaries as per the data collected from CM-VI Survey. It was observed that 61% beneficiaries from Project and 53% from Control areas used Sprinkler as per the requirement only, while 34.4% from Project and 30% from Control used it seasonally. Only 1.6% from Project and 3.3% from Control used Sprinkler irrigation regularly.





Figure 39: Frequency of using Sprinkler System

### Before and after availing - Sprinkler irrigation

Based on the CM-VI Survey data, it appears that before the use of sprinkler systems, the crops grown were primarily soybean, chickpea, cotton, and pigeon pea. It seems the focus shifted more towards Chickpea (percentage increase from 29.27 to 37.14), Onion (2.44 to 4.29%) and Wheat (0 to 5.71%). It was also observed that focus on Pigeon Pea was reduced from 7.32% to 4.29%.

Crops	Before	Percent	After	Percent
Soybean	14	34.15%	17	24.29%
Chickpea	12	29.27%	26	37.14%
Cotton	11	26.83%	17	24.29%
Pigeon pea	3	7.32%	3	4.29%
Onion	1	2.44%	3	4.29%
Wheat	0	0.00%	4	5.71%
Total*	41	100.00%	70	100.00%

Table 37: Crops cultivated before and after Sprinkler Irrigation

\*Note: Cases whose information was available.

Overall, it was observed that soybean, chickpea, cotton, and pigeon pea were the most commonly grown crops before the use of sprinkler systems, at least among the respondents of this survey.

Based on the given data, it appears that a majority of respondents (68.8%) believe that water consumption and wastage in agriculture has reduced after using a sprinkler system. This suggests that the use of sprinkler systems has had a positive impact on water conservation and efficiency in agriculture, at least in the perception of the respondents in this survey.



However, it is also important to note that 18 respondents (28.1%) believe that water consumption and wastage has not reduced after using a sprinkler system. This may indicate that there are limitations or challenges associated with the use of sprinkler systems that may affect their effectiveness in reducing water consumption and wastage.

Overall, the data suggests that the majority of respondents believe that sprinkler systems have reduced water consumption and wastage in agriculture, but there are still some who may have concerns or reservations about their effectiveness.

With regard to question on getting benefitted by using Sprinkler irrigation, it was found that the majority of individuals who have used sprinkler irrigation have reported an increase in income (38.9%) and an increase in production (25.5%). Additionally, a significant portion of respondents reported increased availability of water for protected irrigation (19.5%) and efficient use of water (8.1%).

### Benefits by using sprinkler irrigation

It's worth noting that only a small percentage of respondents reported a change in cropping pattern (2.0%), increased water availability during dry spells (2.7%), an increase in the quality of agricultural produce (1.3%), and an increase in the area of cultivation during *Kharif* and *Rabi* seasons (0.7% each).

Benefitted by using sprinkler irrigation	Total	Percent
Increase in income	58	38.9%
Increase in production	38	25.5%
Increased availability in water for protected irrigation	29	19.5%
Change in cropping pattern	3	2.0%
Availability of water during dry spells	4	2.7%
Efficient use of water	12	8.1%
Increase in quality of agriculture produce	2	1.3%
Increase in area of cultivation during Kharif Season	1	0.7%
Increase in area of cultivation during Rabi Season	1	0.7%
Increased water availability for Rabi season	1	0.7%
Total	149	100.0%

Table 38: Crops cultivated before and after Sprinkler Irrigation

Overall, the data suggests that the use of sprinkler irrigation has had positive effects on income and production for the majority of respondents, while also promoting efficient use of water and increased availability for protected irrigation. However, there may be room for further exploration of the potential impact on cropping patterns and other factors.

Pipes



A total of 1 percent (n=3) beneficiary from Project and 3 percent (n=3) beneficiary from Control Area had applied for pipes (HDPE/PVC). All the three Project beneficiaries had gone for PVC pipes, while in Control, 2 of them had opted for PVC and 1 had gone for HDPE pipes.

Based on the Survey data, it appears that the majority of respondents both from Project and Control Areas who use pipes for irrigation do so regularly (66.7%), while a smaller percentage only use them on requirement (33.3%).

As with the previous analysis, this data is limited due to the small sample size (n=3). However, it does suggest that the majority of individuals who use pipes for irrigation find them to be an important and consistent aspect of their agricultural practices. More information would be needed to determine the reasons for the different patterns of use, and whether or not there are any factors that influence how frequently pipes are used.

Overall, the data suggests that regular use of pipes for irrigation may be a common and important practice among agricultural practitioners, though further research would be needed to explore this topic in greater depth.

Before implementing pipe irrigation, three crops were being grown using some other irrigation method. Out of these three crops, Pigeon pea and Chickpea were the major crops being grown, with each of them making up 33.3% of the total. The fact that they were the major crops being grown using the previous irrigation method suggests that they may be well-suited for the local climate and soil conditions. It will be interesting to see if the implementation of pipe irrigation has any significant impact on the yield or quality of these crops.

With regard to question on the purpose of the pipe being used, 50% of the respondents reported that the pipe set is being used to transport water from a well to a pond. This suggests that the pipe set is being used as part of a system to collect and store water for irrigation purposes. While, 25% of the respondents reported that the pipe set is being used to transport water from a pond to a field. This suggests that the pipe set is being used to distribute water from the storage pond to the fields where crops are being grown. The remaining 25% of the respondents did not specify the purpose for which they were using the pipe set. Overall, the data suggests that the pipe set is being used primarily for irrigation purposes, either to collect and store water or to distribute it to fields.

#### Water Pumps

This benefit was received by 2% beneficiaries from both Control (n=2) and Project (n=4) areas. There was drastic reduction in the application for Water pumps as the activity was kept on hold.

As per data from 4 respondents from Project areas, 50% of the respondents reported that they use the pumps for irrigation only on requirement. This suggests that they do not use the pumps regularly, but rather only when there is a specific need for irrigation. This may be due to irregular rainfall patterns or other factors that make it difficult to predict when irrigation will be



necessary. 25% of the respondents reported that they use the pumps for irrigation seasonally. This suggests that there are specific times of the year when irrigation is necessary, and the pumps are used during those times. This may be related to the growing season for particular crops or to weather patterns. The remaining 25% of the respondents reported that they use the pumps for irrigation regularly. This suggests that they have a consistent need for irrigation and use the pumps on a regular basis to meet that need. Overall, the data suggests that the frequency of using pumps for irrigation can vary widely depending on a variety of factors, including weather patterns, crop growing seasons, and specific irrigation requirements. The survey results from Control area respondents (n=2) was more or less same.

Overall, the data suggests that the pump component is being used primarily for irrigation purposes, either to transport water from natural sources to the fields or to collect and store water for irrigation purposes.

When asked about the HP of the pump they are using, it was observed that 50% of the respondents reported using a 5 HP pump, while 25% reported using a 3 HP pump. The remaining 25% reported using a pump specification that was not specified. From the above data, it appears that the majority of respondents are using relatively powerful pumps for irrigation purposes. 50% of the respondents reported using a 5 HP pump, which is a relatively high horsepower rating. This suggests that these respondents are likely using their pumps to transport water over relatively long distances or to irrigate large fields. Similarly, 25% of the respondents reported using a 3 HP pump, which is also a relatively high rating. The remaining 25% of respondents did not specify the pump specification they were using.

It is important to note that the specific horsepower rating needed for a particular irrigation system will depend on a variety of factors, including the size of the fields being irrigated, the distance between the water source and the fields, and the specific irrigation requirements of the crops being grown. In some cases, a lower horsepower pump may be sufficient for smaller fields or shorter distances. However, the data suggests that the respondents in this survey are using relatively powerful pumps, which may indicate that they are irrigating larger fields or transporting water over longer distances.

When asked about the use of capacitor, the response from beneficiaries in Project and Control areas was 50%, which indicates that there is a need to train them about the importance of capacitor in Water pumps.

With regard to the diameter of the pipes being used with Water pump, it appears that there is some variability in the diameter of pipes being used for irrigation purposes. Each respondent reported using a different diameter of pipe: 25% reported using a 1 inch pipe, 25% reported using a 1.5 inch pipe, 25% reported using a 2 inch pipe, and the remaining 25% reported using a pipe diameter that was not specified.



The diameter of the pipe used in an irrigation system can affect the flow rate and pressure of the water being transported. Generally, a larger diameter pipe will allow for greater flow rates and lower pressure losses over longer distances. However, the specific diameter needed for a particular irrigation system will depend on a variety of factors, including the distance between the water source and the fields, the elevation changes along the pipeline, and the specific irrigation requirements of the crops being grown.

Overall, the data suggests that there is some variability in the specific diameter of pipes being used for irrigation, but the sample size is too small to draw any definitive conclusions about the most common pipe diameter being used in the area.

Based on the Survey data, it appears that there is some variability in the major crops being grown in the area before getting water pump benefit for irrigation, 50% of the respondents reported growing cotton, while 25% reported growing soybean and chickpea each. Overall, the data suggests that cotton is the most common crop grown in the area where water pump irrigation is being used, but there is also some diversity in the types of crops being grown. However, since the sample size is small, it is difficult to draw any definitive conclusions about crop patterns in the area.

It appears that the primary purpose of the pump component for irrigation is to lift water from a River or Canal, with 50% of respondents reporting this use. 25% of respondents reported using the pump to transport water from a well to a pond, and another 25% reported using the pump to draw groundwater. Lifting water from a river or canal is a common use of pumps in irrigation, particularly in areas where water resources are limited or located at a distance from the fields being irrigated. Transporting water from a well to a pond can be another effective way to store and manage water for irrigation, particularly if the well is located on or near the farm. Drawing groundwater is another common method of irrigating crops in areas where the water table is high enough to support this type of irrigation.

When asked about the use of pump sets for the type of irrigation, it was observed that the majority of them (66.7%) use a drip or sprinkler irrigation system. One respondent (16.7%) each uses flood and furrow irrigation systems.

This information suggests that drip or sprinkler irrigation systems are more popular among the users of the pump set. This could be due to several reasons such as its efficiency in water usage, precision in delivering water to the crops, and its ability to minimize water wastage. The use of flood and furrow irrigation systems may be less popular due to their higher water usage and potential for water wastage.

However, it's worth noting that this analysis is based on a small sample size and may not be representative of the larger population. A larger sample size would be necessary to draw more conclusive insights about the types of irrigation systems used with pump sets.



### Open dug well

There was only one beneficiary interviewed for the intervention of Open Dug Well. It was recharged in the month of August, 2022. The Agriculture Department staff had explained the procedure for recharge of open dug well. As per information, he said he was benefitted with increase in level of water and also helped in availability for protective irrigation which has resulted in higher productivity and income.

## Status of Community based Soil & Water Conservation Activities

Activities under this included Graded Bunding, Continuous Contour trenches, Cement Nala bund, etc. As part of CM-VI, NRM activities that have been completed are covered accordingly. Total 50 beneficiaries have been covered in project villages and 25 beneficiaries in control villages as part of CM-VI. The community activity conducted by the community appears to have primarily involved the construction of compartment/graded bunding, which was undertaken by 40 out of 50 respondents (80%), in Control areas it was 48%. This technique involves the construction of soil bunds in compartments to control soil erosion and conserve moisture. It is a commonly used technique for improving soil health and productivity in agricultural areas. The community also engaged in the construction of cement nala bunds, which was undertaken by 8 out of 50 respondents (16%), in Control it was only 4%. This technique involves the construction of cement bunds in water channels to control soil erosion and regulate water flow. In addition, the community also engaged in the construction of continuous contour trenches and deep continuous contour trenches, which were each undertaken by 1 out of 50 respondents (2%). These techniques involve the construction of trenches along the contour lines of the land to prevent soil erosion and improve water infiltration. It is clearly observed that community activities were primarily focused on implementing soil conservation and water management techniques to improve agricultural productivity and sustainability.

In CM-VI Survey it was observed that from 50 sampled community activities, 49 of them have been constructed, while only one is still under construction. This suggests that the community has been successful in completing the majority of their planned activities. The high completion rate is a positive sign, indicating that the community is committed to implementing and completing their planned activities, which is likely to lead to improved agricultural practices and overall sustainability.

From 50 sampled community activities, 10 were completed in 2019, 32 in 2020 and 8 in year 2021. While in Control Areas, out of 25 community activities, 21 were completed in year 2019 and remaining 4 were completed in year 2020.



Based on the survey data, 84% of the sampled population responded that a social audit has been done in their village. This indicates that there has been some level of transparency and accountability in the functioning of the village community, and a mechanism to review and evaluate the implementation of various development projects and programs. However, it is concerning that, 12% of the respondents don't know if a social audit has been done, which suggests a lack of awareness or communication about such activities. It is important to ensure that all members of the community are informed and involved in these processes to promote transparency and accountability.

Overall, the majority of respondents (74%) rated the construction quality of the structure as satisfactory (somewhat or very), while 26% rated it as unsatisfactory (somewhat or very). This indicates that there is room for improvement in the construction quality of the structure, but the majority of respondents are still generally satisfied with it.

Based on the Project Survey data, 60% of the respondents believed that the ground water level has increased near their farm land after the construction of the NRM asset. This is a positive outcome and suggests that the construction of the NRM asset has had a beneficial impact on the water table in the area. On the other hand, 34% of respondents believed that there has been no increase in ground water level, but they believe that it could increase in the future. This suggests that there is still some uncertainty about the long-term impact of the NRM asset on the water table. Only 6% of respondents did not expect any change in ground water level. This could be due to various factors such as lack of knowledge, prior experience or other factors. Overall, the data indicates that the construction of the NRM asset has had a positive impact on the ground water level according to a majority of respondents.

### **Benefits from NRM Activities**

The table shows the results of the CM-VI survey conducted on the benefits of NRM (Natural Resource Management) work. The was found that the top two benefits reported by respondents were an increase in yield/production (27.7%) and increased availability of water for protective irrigation (24.8%). This suggests that the NRM work was effective in improving agricultural productivity and reducing water stress for crops.

Whether benefitted from this NRM work?	Total	Percent
Increase in yield/ production	28	27.7%
Increased availability in water for protective irrigation	25	24.8%
Availability of water during dry spells	9	8.9%
Change in cropping pattern	8	7.9%
Increase in income	7	6.9%



Decreased Soil Erosion	7	6.9%
Increased Ground Water level	6	5.9%
Increase in area of cultivation during Kharif Season	5	5.0%
	4	4.0%
Increase in area of cultivation during Rabi Season		
Increased Soil Moisture Duration	2	2.0%
Total	101	100.0%

Other benefits reported include availability of water during dry spells (8.9%), change in cropping pattern (7.9%), increased income (6.9%), decreased soil erosion (6.9%), increased groundwater level (5.9%), and increased area of cultivation during Kharif and Rabi seasons (5.0% and 4.0%, respectively). These findings suggest that the NRM work had multiple positive impacts on the local agricultural ecosystem, which is a positive outcome.

However, it is important to note that only 2% of respondents reported increased soil moisture duration, which suggests that this aspect of the NRM work may require further attention or improvement.

Overall, the results of this study suggest that the NRM work had several positive impacts on agricultural productivity and water availability, which are essential for sustaining livelihoods and food security in the region. These findings can be used to inform future NRM interventions and guide decision-making for sustainable agricultural practices.

# **Component B: Post-harvest Management and Value Chain Promotion**

Along with interventions for climate resilient agriculture systems, it was essential to develop adsorptive capacity of stakeholders. This component aims to support the participation of smallholders of Farmers Producer Companies (FPCs), Self Help Groups (SHGs) and integration in the value chains of major crops and to strengthen the supply chain for the climate-resilient crop varieties in the project area. The component also seeks to improve the seed supply chain in the project areas.

As part of CM-VI survey, data had been collected on parameters related to FPCs, SHGs and seed supply chain in rest of project area. The feedback on value chain activities, support through PoCRA, benefits, issues and challenges had been recorded and is presented in this section.

# Findings from FPOs Supported by PoCRA Status of FPCs in CM-VI Survey

In CM-VI Survey, in Project areas we had interviewed 30 Board of Directors and 33 Members totalling 63 from 21 FPCs. In Control we interviewed 16 Board of Directors and 17 members of FPCs, totalling 33 respondents from 11 FPCs surveyed. It was found that 91% from Project and 73% from Control areas had mixed (Male and Female) membership in FPCs, and 27.3% in Project and 9.5% in Control had only Male membership.





Figure 40: Composition of FPCs

It was observed that out of 21 FPCs in Project 97% were functional, while in Control Areas, out of 11 FPCs, 94% were operational.



Figure 41: Functional FPCs

With regard to trainings received 41% from Project and 52% from Control (P: 63, C: 33) have received training on FPC Management. The trainings in Project Areas where given by ATMA (20.6% members), VAMNICON (4.8% members) and from other sources (about 16% members). While in case of Control 55% members have received trainings from other sources. As per data available from the CM-VI Survey, In Project villages, 28 members (out of total 33) have always participated in general body meetings, 4 members have participated sometimes, while 1 had rarely participated. Of these 28 were always involved in decision making process of their FPCs.



While in case of Control villages out of 17 respondents, 16 have always participated in the general body meetings and were involved in decision making process of their respective FPCs, while 1 has participated sometimes.

When questioned about the trainings received through their FPC, out of 33 respondents, 33% from Project and 53% (out of 17 respondents) from Control said that they have received trainings from their FPCs.

### **Trainings received through FPCs**

From the 32 beneficiaries from Project Areas, 28.1% received training on skill upgradation, 18.8% on financial planning, 15.6% on leadership development, and another 18.8% on farming technologies. It can be concluded that the FPC provided training on a range of topics related to farming, finance, and leadership development to its members, with a focus on skill upgradation being the most common area of training. From Control Areas out of 20 respondents, 25% received training on skill upgradation, 15% on financial planning, 35% on leadership development, and another 15% on farming technologies. It can be concluded that the FPC provided training on a range of topics related to farming, finance, and leadership development, 15% on farming technologies. It can be concluded that the FPC provided training on a range of topics related to farming, finance, and leadership development to its members, with a focus on leadership development being the most common area of training.

#### **Business Plans for Financial Support**

As a part of survey, that asked participants whether they were aware of business plans prepared by their company for financial support to be received from PoCRA. Of the 63 respondents from Project areas, 29 (46.0%) reported that they were aware of the business plans prepared by their company for financial support from PoCRA, while only 4 (6.3%) answered that they were not aware of such plans. In case of Control, only 33% were aware of the business plans prepared by their company for getting financial support.

As per the questionnaire it was asked to the participants whether they had sold their agriculture produce through FPC (Farmers Producer Company) in the past. Of the 63 respondents from Project areas, only 9 (14.3%) reported that they had sold their agriculture produce through FPC, while the vast majority of respondents, 54 (85.7%), answered that they had not sold their produce through FPC.

This suggests that a large proportion of farmers surveyed in this study had not yet availed themselves of the opportunities presented by FPCs to sell their agricultural products. It may be worthwhile for FPCs to undertake more awareness-raising activities and outreach efforts to educate farmers on the benefits of selling their produce through FPCs, as this could potentially increase the number of farmers who utilize FPCs for marketing their produce.

While, of the 33 respondents from Control Villages, 14 (42.4%) reported that they had sold their agriculture produce through FPC, and about 19 (57.6%) answered "no," indicating that they had not sold their produce through FPC. This suggests that a relatively higher proportion



of farmers surveyed in this study had sold their agricultural products through FPCs as compared to the Project data we analysed. However, a majority of the farmers had not yet utilized the opportunities presented by FPCs to sell their produce.

We also asked participants whether their FPC (Farmers Producer Company) had received any grant from POCRA (Promoting Climate-Resilient Agriculture) for any business activities. An overwhelming majority of respondents, 61 (96.8%), reported that their FPC had received a grant from POCRA for business activities, while only 2 (3.2%) answered "no," indicating that their FPC had not received such a grant.



Figure 42: Received grants from PoCRA

This suggests that POCRA has been successful in providing grants for business activities to a large number of FPCs. The availability of such grants can help FPCs to invest in and expand their businesses, potentially leading to increased profits and improved livelihoods for farmers.

# **Current Activities by FPC**

The graph shows the results of a survey that asked participants about the activities their FPC (Farmers Producer Company) was currently involved in. Of the 79 Project beneficiaries, 10 (12.7%) reported that their FPC was involved in the aggregation of produce, while 15 (19.0%) reported that their FPC provided agricultural inputs like seeds and fertilizers. Only 6 (7.6%) respondents reported that their FPC provided access to markets for produce, while 5 (6.3%) respondents reported that their FPC was involved in the value addition of agricultural produce, such as sorting and grading.





Figure 43: Activities in which FPCs currently involved at present

A total of 7 (8.9%) respondents reported that their FPC provided training to farmers on best agricultural practices, while a large proportion of 36 (45.6%) respondents reported that their FPC was involved in "other" activities, suggesting that FPCs may be involved in a wide variety of activities.

Overall, the results suggest that FPCs are involved in a range of different activities, including aggregation of produce, provision of agricultural inputs, and value addition of agricultural produce. However, the relatively low percentage of respondents who reported that their FPC provides access to markets for produce highlights the need for FPCs to focus on marketing activities to help farmers sell their products effectively. The large proportion of respondents reporting "other" activities suggests that FPCs may be involved in a wide variety of activities.

Of the 45 respondents from Control Villages, 12 (26.7%) reported that their FPC was involved in the aggregation of produce, while 9 (20.0%) reported that their FPC provided agricultural inputs like seeds and fertilizers. 7 (15.6%) respondents reported that their FPC provided access to markets for produce, while only 3 (6.7%) respondents reported that their FPC was involved in the value addition of agricultural produce, such as sorting and grading.

A total of 2 (4.4%) respondents reported that their FPC provided training to farmers on best agricultural practices, while a significant proportion of 12 (26.7%) respondents reported that their FPC was involved in "other" activities.

#### Facilities/Services provided by FPCs

Out of a total of 81 beneficiaries from Project areas, 61.7% (50) received access to equipment/tools for agriculture through their FPC. 8.6% (7) of the respondents purchased



seeds through their FPC, while only 1.2% (1) purchased chemicals/fertilizers through their

# FPC.

		F	Frequency	
S.No.	Facilities or Services provided by FPC	Total	Percent	
	Total	81	100.0%	
1	Marketing support in selling agriculture Produce	5	6.2%	
2	Purchasing seeds through FPC	7	8.6%	
3	Purchasing chemicals fertilizers through FPC	1	1.2%	
5	Value Addition	1	1.2%	
6	Access to equipment/tools for agriculture	50	61.7%	
7	Access to godown facility	6	7.4%	
8	Others	9	11.1%	
9	None	2	2.5%	

Table 40: Facilities or services provided by the FPCs from Project Area

Similarly, only 1.2% (1) of the respondents converted their agriculture produce to value-added products with the help of their FPC. 6.2% (5) of the respondents received marketing support from their FPC in selling their agriculture produce. 7.4% (6) of the respondents received access to godown facilities through their FPC, while 11.1% (9) reported receiving other facilities or services from their FPC. Lastly, 2.5% (2) of the respondents reported not receiving any facilities or services from their FPC.

Table 41: Facilities or services	s provided by the	FPCs from Control Area
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		Frequency	
S.No.	Facilities or Services provided by FPC?	Total	Percent
	Total	38	100.0%
1	Marketing support in selling agriculture Produce	13	34.2%
2	Purchasing seeds through FPC	9	23.7%
3	Purchasing chemicals fertilizers through FPC	5	13.2%
4	Grading and sorting of agriculture produce with support of FPC	3	7.9%
5	Value Addition	2	5.3%
8	Others	4	10.5%
9	None	2	5.3%

Out of the 38 respondents from Control Villages, 13 (34.2%) reported receiving marketing support in selling their agriculture produce through their FPC. Nine (23.7%) respondents reported purchasing seeds through their FPC, while five (13.2%) reported purchasing chemicals and fertilizers. Three (7.9%) respondents reported receiving grading and sorting services for their agriculture produce with the support of their FPC, and two (5.3%) respondents reported converting their agriculture produce to value-added products, such as converting soybeans to soybean oil, with the support of their FPC. Four (10.5%) respondents



reported receiving other services from their FPC, and two (5.3%) reported receiving no facilities or services from their FPC.

		Frequency	
S.No.	Crops sold through your FPC	Total	Percent
	Total	15	100.0%
1	Pigeon pea	3	20.0%
2	Soybean	3	20.0%
3	Chickpea	7	46.7%
4	Green gram	1	6.7%
5	None	1	6.7%

Table 42: Crops/ agriculture produce sold through the FPCs in Project Area

The above table shows the frequency and percentage of the different types of crops (agricultural produce) that have been sold through the FPC in Project area. A total of 15 respondents have sold their crops through the FPC. Out of the 15 beneficiaries from Project areas, 3 (20.0%) sold pigeon pea, 3 (20.0%) sold soybean, 7 (46.7%) sold chickpea, and 1 (6.7%) sold green gram. One respondent (6.7%) indicated that they had not sold any crops through the FPC. In conclusion, chickpea appears to be the most commonly sold crop through the FPC, with nearly half of the respondents indicating that they had sold it. Pigeon pea and soybean were also sold by some of the respondents, while only one respondent sold green gram.

		Frequency	
S.No.	Agri. Produce	Total Percent	
	Total	20	100.0%
1	Cotton	3	15.0%
3	Soybean	4	20.0%
4	Chickpea	6	30.0%
6	Sorghum	3	15.0%
12	Others	2	10.0%
13	None	2	10.0%

Table 43: Crops/ agriculture produce sold through the FPCs in Control Area

Out of the 20 respondents, 15 have sold their agriculture produce through their FPC in Control areas. The most commonly sold crop was chickpea, with 7 respondents (46.7%) reporting that they have sold this crop through their FPC. Soybean and pigeon pea were each sold by 3 respondents, making up 20% of the total. Green gram was only sold by 1 respondent (6.7%), while another 1 respondent (6.7%) reported that they have not sold any crops through their FPC.

In summary, the most commonly sold crop through the FPC was chickpea, followed by soybean and pigeon pea.



# Status of SHG and Farmer Groups

In CM-VI Survey, 32 beneficiaries were interviewed including 10 SHGs (with total Female members) and 22 Farmer groups (19 with Male and Female members), and 3 with only Male members. While in case of control 16 SHGs were interviewed with only Female members.

# **Topics of training received for SHG/Farmer Groups**

Out of the total 32 respondents from Project areas, the majority received training on financial planning (21.9%), followed by farming technologies and skill upgradation (both at 21.9%). Leadership development and market awareness were also popular topics for training, with 18.8% and 15.6% of respondents receiving training on these topics, respectively.

While in Control villages 28% respondents received training on was skill upgradation. The next most common topics are financial planning and market awareness, both with 15.6% of respondents reporting these. Leadership development and farming technologies are also important topics that some respondents had received training.

With regard to training on business establishment, out of 32 beneficiaries from Project area, only 8 received training on business establishment. Among those 8, 2 received training from Agriculture Department, 2 received from *Krishi Vigyan Kendra*, and 4 received from MSRLM. The majority of the respondents, 24 out of 32, did not receive any training on business establishment.

This suggests that there is a need for more training and support in business establishment, especially for those who are not yet equipped with the knowledge and skills in starting their own business. PoCRA should focus on providing more training programs to empower individuals who are interested in entrepreneurship.

While in case of Control Areas out of 16 respondents only a minority of respondents (6.3%) received training on business establishment from the Agriculture Department, while an equal number (6.3%) received training from another government department. A slightly larger proportion of respondents (12.5%) received training from *Krishi Vigyan Kendra*, a government agency dedicated to agricultural extension. The majority of respondents (62.5%) received training from other sources.

# Frequency of Saving with SHG/ Farmer Groups

With regard to question on the frequency of saving as a part of the SHG, out of total 32, the majority of the respondents (71.9%) saved monthly as part of a SHG, which indicates a regular and consistent saving habit. Only 2 respondents (6.3%) save annually as part of a SHG, which



suggests a low level of participation or commitment to the group. While, 7 respondents (21.9%) are not saving currently as part of a SHG, which could imply various reasons such as lack of income, lack of trust, lack of awareness, or lack of access to the group. While in Control Areas out of 16 respondents who were part of the SHG, 87.5% saved on a monthly basis and 12.5% saved on a weekly basis.

### Trainings received as a part of SHG/ Farmer Groups

In Project Areas 28% of the 32 respondents have received training as part of the SHG, while 72% have not. It can be concluded that while some members have received training, there is still a significant portion who have not. This may indicate a need for more training opportunities for SHG members to improve their knowledge and skills. While in case of control villages out of 16 respondents, 68.8% reported receiving training as part of their SHG, while 31.3% did not receive any training. This indicates that the majority of the respondents have received some form of training through their SHG. Since, sample size is small and cannot be a representative data of the population.

#### Income Generation by SHGs/ Farmer Groups

From the response generated from 32 beneficiaries of Project area it was found that 75% of the respondents' SHGs were currently involved in some form of income-generating activity, while the remaining 25% were involved only in monthly savings. While in case of Control Villages out of the 16 respondents, 7 (43.8%) answered "Yes," indicating that their SHG is currently involved in some income-generating activity. On the other hand, 9 (56.2%) respondents answered "No," indicating that SHGs are not currently involved in any income-generating activity.



Figure 44: SHGs involved in business activities

### Facilities or services provided by SHGs

From Project Areas 25.7% of the respondents said they get access to equipment/tools for agriculture from their SHG. This suggests that the SHG is providing support for agricultural activities by giving members access to tools and equipment which they may not be able to afford individually. Additionally, 37.1% of the respondents mentioned "Others" as the kind of facilities or services they receive from their SHG, which suggests that the SHG is providing a variety of services to its members. It is worth noting that 25.7% of the respondents said they provide none of the facilities or services from their SHG, indicating a potential gap in the services being provided. The SHG may want to consider providing additional support to its members to ensure that everyone is benefiting from the group's activities.

While from Control Villages out of the 16 respondents, 2 (12.5%) indicated that their SHG provided facilities or services to convert their agriculture produce into value-added products. Additionally, 9 (56.3%) respondents indicated that their SHG provided other kinds of facilities or services, while 5 (31.3%) respondents indicated that their SHG did not provide any facilities or services.

### Awareness on the financial support from PoCRA

From Project Villages out of 32 respondents, 26 (81.3%) were aware of the financial support that their SHG was/will be receiving from PoCRA, while 6 (18.8%) were not aware. This indicates that the majority of the respondents were informed about the financial support from PoCRA. The majority of the beneficiary respondents, 31 out of 32 (96.9%), reported that their SHG has received a grant from POCRA for business activities. Only 1 respondent (3.1%) answered "No". This suggests that POCRA has been actively providing financial support to SHGs for their business activities.

### Type of agribusiness project/activity started with PoCRA support

The CM-VI Survey data shows that the most common type of agribusiness project/activity started with PoCRA support is the Custom Hiring Centre, with a frequency of 30 out of 48 respondents (62.5%). This suggests that there is significant interest among PoCRA beneficiaries in utilizing shared resources and equipment to support their agricultural activities.





Figure 45: Type of Agribusiness with PoCRA Support

Other types of projects/activities started with PoCRA support included Godowns (6.3%), Pulse mills (4.2%), Silage Units (2.1%), Spices Units (4.2%), Goat breeding centres (4.2%), and Others (16.7%). The relatively low frequency of these other types of projects suggests that they may be less commonly pursued by PoCRA beneficiaries, but they still represent important areas of investment and innovation in the agricultural sector.

Overall, the data suggests that PoCRA support has been successful in enabling and encouraging the development of a diverse range of agribusiness projects and activities among beneficiaries. The high frequency of Custom Hiring Centres in particular indicates that there is significant demand for shared resources and equipment, which could be further leveraged to support agricultural productivity and sustainability in the region.

# Status of Loan by SHGs from Banks

Out of 48 respondents from Project Areas, only 5 (10.4%) FPC/SHG groups have taken a loan from a bank, while the majority of 43 (89.6%) have not taken a loan. This suggests that access to formal credit may be a significant challenge for many FPC/SHG groups, which could limit their ability to invest in and grow their agricultural businesses.

However, it is also possible that some FPC/SHG groups may have chosen to rely on alternative sources of financing, such as savings or informal loans, which are not reflected in this data. Additionally, it is unclear whether the FPC/SHG groups that have not taken a loan from a bank have attempted to do so in the past but were unsuccessful, or if they simply have not pursued this option.



Overall, the data highlights the importance of exploring and addressing barriers to formal credit access for FPC/SHG groups, which could help to unlock their potential as drivers of economic growth and agricultural development in the region.

# Status of Custom Hiring Centres (CHCs)

During CM-VI Survey it was observed that Custom Hiring Centres was most popular activity adopted by FPCs and SHGs. These centres help farmers in accessing costly equipment's on rental basis, which helps them to cope the issues of labour shortage, cost of cultivation and timely operation, contributing to Climate Resilience Activities.

### Availability of Machines at Custom Hiring Centres

The following frequency table shows the type of machines available in the Custom Hiring Centres. The total number of machines is 215. The most common machines available are ploughs (26), followed by rotavators (25), and tractor large more than 35 HP (30). There is a variety of other machines available, such as harrows, power weeders, cultivators, trailers, seed drills, and others.

S No.	Type of machine available in Custom Hiring	Frequency	
5.NO.	Centre	Total	Percent
1	Reaper	1	0.50%
2	Shredder (Cotton, Maize, etc.)	1	0.50%
3	Mulching machine	1	0.50%
4	V-pass	1	0.50%
5	Trailor (below 1 brass)	2	0.90%
6	Combined Harvester	2	0.90%
7	Land Leveller	2	0.90%
8	Power Tiller	3	1.40%
9	Chaff cutter	3	1.40%
10	Turmeric Harvester	3	1.40%
11	Multicrop Thresher (Below 30 hp)	4	1.90%
12	Harrow	5	2.30%
13	Power weeder	5	2.30%
14	Cultivator-5 tyne	5	2.30%
15	Blower	5	2.30%
16	Panaji	5	2.30%
17	Seed drill (BBF) – 4 tyne	6	2.80%
18	Multicrop Thresher (30 hp and above)	7	3.30%
19	Tractor small up to 35 hp	9	4.20%
20	Trailor (above 1 brass)	10	4.70%
21	Cultivator -9 tyne	17	7.90%
22	Broad Bed Furrow Machine	17	7.90%

#### Table 44: Type of machine available in the CHC



23	Seed drill (BBF)-9 tyne	20	9.30%
24	Rotavator	25	11.60%
25	Plough	26	12.10%
26	Tractor large more than 35 HP	30	14.00%
	Total	215	100.00%

### Perceived benefits of CHC by the farmers

Based on the CM-VI Survey data, it was observed that the majority of beneficiaries surveyed perceive the CHC to have benefits. The most common benefit is that the machines are available at discounted rates, with 25 out of 55 respondents (45.5%) selecting this option. The second most common perceived benefit is the reduction in cost of cultivation, with 14 out of 55 respondents (25.5%) selecting this option. Additionally, 8 respondents (14.5%) selected "solution to labour issues" and another 8 respondents (14.5%) selected "increase in rural employment" as perceived benefits of the CHC.

### **Training of SHG Director/Members**

It was observed from CM-VI Survey data that out of 30 agribusiness projects/activities supported by PoCRA, only 8 directors from the director body have taken training on the working of CHC, which accounts for 26.7%. On the other hand, 22 directors, which accounts for 73.3%, have not taken any training on the working of CHC. This indicates a lack of training and knowledge among the directors regarding the functioning of CHCs. It is important for the directors to have adequate knowledge and training to ensure the smooth functioning of CHCs and to make informed decisions related to the agribusiness projects/activities. Therefore, it is recommended that more training programs be organized to improve the knowledge and skills of the directors in the future.

It was asked if the tools in the tool bank available to the group members / shareholders at low rates? From the CM-VI Survey data it was interpreted that the majority of the respondents (93.3%) reported that the tools in the tool bank are available to the group members/shareholders at low rates. Only 6.7% of the respondents reported that the tools are not available at low rates. This suggests that the tool bank is functioning well and providing affordable access to tools for the group members/shareholders

		Frequency	
S.No.	Discounted rates for shareholders to hire the tools	Total	Percent
	Total	30	100.0%
1	No lower rate offered	2	6.7%
2	10% lower rate	11	36.7%
3	10-20% lower rate	10	33.3%

Table 45: Discounted rates for shareholders to hire the tools



4	More than 20% lower rate	6	20.0%
9	Don't know	1	3.3%

It can be concluded from above table that about 36.7% of the shareholders hire tools at a discounted rate of 10% lower than the market rate, 33.3% of the shareholders hire tools at a discounted rate of 10-20% lower than the market rate, 20.0% of the shareholders hire tools at a discounted rate of more than 20% lower than the market rate, Only 6.7% of the shareholders reported that no lower rate is offered to them, while one shareholder (3.3%) reported that they don't know at what discounted rate they hire tools. Overall, the majority of shareholders hire tools at a discounted rate, with a significant proportion of them getting a discount of more than 10% lower than the market rate. This suggests that the tool bank is providing a valuable service to its members and helping to reduce their costs.

# Average area covered by the CHC services in one year

The majority of CHCs (53.3%) provide services within an area of 50 hectares or less in one year, 36.7% of CHCs cover an area between 50 to 100 hectares in one year, only one CHC (3.3%) covers more than 100 hectares in one year.



Figure 46: Average area covered by the CHC in one year

From this data, it can be concluded that CHCs generally provide services to a relatively small area, with the majority covering an area of 50 hectares or less in one year.



# Farmers benefitted by the CHC

From CM-VI Survey data it was found that the majority of farmers in the project village (72%) have been benefitted by the CHC, with 21 out of 30 respondents indicating that 1 to 50 farmers have been benefitted. Additionally, 14% of respondents indicated that 51 to 100 farmers have been benefitted. However, it is worth noting that 7% of respondents reported that none of the farmers in the project village have been benefitted by the CHC, which suggests that there may be room for improvement in terms of reaching out to and providing services to all potential beneficiaries.

While in case of Control area, out of the total sample size of 30 respondents, 15 respondents (50.0%) reported that 1 to 50 farmers were benefitted, while only 3 respondents (10.0%) reported that 51 to 100 farmers were benefitted, 10 respondents (33.3%) reported that none of the farmers in their village were benefitted by the CHC.



#### Figure 47: Farmers benefitted by CHC in Project villages

It can be concluded that more than half of the respondents reported that only 1 to 50 farmers were benefitted. The low percentage of respondents reporting that 51 to 100 farmers were benefitted suggests that the CHC has limited reach in these villages. The high percentage of respondents reporting that none of the farmers were benefitted is also concerning and



indicates that there may be issues with the implementation or accessibility of the CHC in these villages.



## Men trained to operate the equipments

Figure 48: Men trained to operate the equipments

The above graph shows that out of a total of 30 respondents, 33.3% (10) of them reported that there are no men are trained to operate the equipment. 50% (15) of respondents reported that 1 to 5 men are trained to operate the equipment, while 16.7% (5) did not know. This suggests that there is a need for more men to be trained in operating equipment in order to ensure that the agribusiness activities are carried out effectively and efficiently. The lack of trained men may lead to delays and inefficiencies in the use of the equipment, which could impact the overall productivity and profitability of the agribusiness project.

# **Women Trained to Operate Equipments**

The CM-VI survey data shows that out of the 30 respondents, 66.7% (20) reported that there were no women trained to operate the equipments, 13.3% (4) reported that 1 to 5 women were trained, and 20% (6) were not sure about the number of women trained.





Figure 49: Women trained to operate the equipments

These results suggest that there is a significant gender gap in equipment training, with a majority of men being trained and very few women receiving such training. This highlights the need for gender-sensitive policies and programs to promote equal access and opportunities for women in agriculture.

### Difficulties faced by farmers in accessing the benefits of the CHC

As per the survey data only 3 out of 30 beneficiaries reported facing difficulties in accessing the benefits of the CHC. One beneficiary reported high fuel costs as a difficulty, while another reported non-operational machines as a difficulty. It is worth noting that these difficulties were reported by a very small percentage of the total respondents, indicating that the majority of farmers are not facing significant challenges in accessing the benefits of the CHC.

### Awareness of the CHC facilities

It was found that out of the 30 respondents, 28 (93.3%) villagers are aware of the CHC facility while only 2 (6.7%) villagers are not aware of it. This indicates a high level of awareness of the CHC facility among the villagers.

### Accessibility to villagers to utilise the CHC facility

Based on the survey, 90% of the respondents answered that all villagers are able to access/utilize the CHC facility, while 10% responded negatively. This suggests that the majority of villagers have access to the CHC facility, but there may be some limitations or barriers that prevent a small number of villagers from utilizing the facility.


## **Display board regarding Project benefits**

Based on the responses provided, it can be interpreted that in 83.3% of the project villages, a board has been displayed regarding project benefits, while in the remaining 16.7% of villages, such boards have not been displayed.

# **Asset Verification**

As per the CM-VI Survey data, out of a total of 30 respondents, 29 (or 96.7%) reported that all the equipments sponsored under the agribusiness component of POCRA project were found in good condition and operational, while only 1 respondent (or 3.3%) reported that some of the equipments were not in good condition. This suggests that most of the equipments under the agribusiness component of the project are being maintained properly and are available for use by the beneficiaries. During verification, no malpractices and misuse of moveable assets were observed. The details are given in the Annexure I attached.

# Findings from KII with FPCs under CM-VI Survey

In the CM-VI survey, we interviewed 21 FPCs from Amravati, Akola, Buldhana, Wardha, Washim, and Yavatmal districts. Out of these 21 FPCs, 16 FPCs have adopted Custom Hiring Centre (CHC), and one FPC each had constructed a Godown, Grain Drying and Gram Floor Unit, Dal Mill, Silage Unit, and Auction Shed. Additionally, one FPC was registered in 2015, two FPCs in 2017 and 2018, five FPCs in 2020, and 11 FPCs in 2021. These FPCs were formed by farmers under various projects such as MACP, ITC-Switch On Foundation, NABARD, and Bajaj Foundation. The FPCs received information about the PoCRA project through ATMA and Agriculture department officials and applied for various activities.

# **Participation and Decision Making**

The FPCs have arranged monthly meetings where discussions are done on the business development plan. Also, various activities are held and organized by the President and Directors of the FPCs. The President and Directors attend the meetings, and on average, 50-60% of the members were present during the meetings. Most of the members were actively participating in the group meetings. The FPCs had taken special efforts to increase the participation of women farmer/farmers from vulnerable/tribal communities by registering them as shareholders of the FPC. These members have benefited from various project-related information and activities. The FPCs have procured Pigeon Pea and Gram as a business activity and informed the shareholders.

# **Financial Discipline**

The President and Directors are able to check the balance of the FPCs' bank accounts, but it is not clear that all members know how to check the account balance. Directors knew the



bank-related works, and the President and Secretary have the authority to withdraw money. None of the other members save a monthly amount, nor have borrowed any amount. Most of the FPCs had utilized the profit amount for implementing other activities, which could be the reason for not borrowing.

#### **Training/ Capacity Building attended by Members**

Out of the 21 FPCs, members of 13 FPCs attended the capacity building program while the members of 8 FPCs did not attend trainings. The training were conducted at various places including Agriculture Department, ATMA, KVK, and Agriculture University. The topics of training covered several aspects such as preparation of business proposals, financial management, market linkages, and availing subsidy for taking implements on a rental basis, seed production and processing, and waste management. As a result of the training, FPC members were able to prepare business proposals and installed various business models. The training also increased the capacity and knowledge of FPC members for developing their businesses.

Regarding the question on further training needed and type of training required, the respondent indicated that training on market linkages, marketing management, audit evaluation, and record maintenance are needed. Furthermore, out of the total number of FPC members, 8 FPCs have not received the required training, and it was recommended that these members should receive the necessary training.

FPC Name	Village and Dist.	Capacity building	Need further training
Sahas Farmer Producer Company Ltd.	Jamathi Ganeshpur , Tehsil-Warud, Dist. Amravati	02 members participated at Vaikunt Mehta Rastriy Sahakari Prabodhan Sanstha, Pune. The topics covered in the training are Making the business development plan and establishing of market linkages.	Further training is needed regarding the bank workings system and business management.
Sewarth Farmer Producer Company Ltd.	Murtizapur, Dist. Akola	02 members participated. One training was organized on the SMART project by Agri. Dept. While second training was organized by PMU on financial management, business development plan, and digitization.	Need further training on GST and technical knowledge.
Kapashi Farmer Producer Company Ltd.	Kapshi, Tehsil and Dist. Akola	None of the capacity-building training was attended.	Training on business development plans and financial management is required
Ruikhed Farmer Producer Company Ltd.	Ruikhed, Tehsil- Akot, Dist. Akola	None of the capacity-building training was attended.	Training on business development plans and market linkages is required.

7	Table 46:	Details	of	Training	Received	bv	FPCs



Shatrunjay Farmer Producer Company Ltd.	Alegaon, Tehsil- Patur, Dist. Akola	None of the capacity-building training was attended.	Training on record maintenance and technical inputs is required
Wasuputra Farmer Producer Company Ltd.	Raikhed, Tehsil- Telhara, Dist. Akola	10 Directors participated in a training organized by Switch Foundation. Topics covered such as process, registration, criteria, market linkages, crop cultivation practices, etc.	Training on scheme linkages and exposure visits is required.
Citrana Farmer Producer Company Ltd.	Akot, Dist. Akola	None of the capacity-building training was attended.	Training on market linkages is required
Chandanshesh Farmer Producer Company Ltd.	Sawana, Tehsil- Chikhali, Dist. Buldhana	None of the capacity-building training was attended.	No training is required for the respective FPC
Rajmuktai Farmer Producer Company Ltd.	Konti, Tehsil- Khamgaon, Dist. Buldhana	None of the capacity-building training was attended.	No training is required for the respective FPC
Prakashparva Farmer Producer company Ltd.	Songavhan, Tehsil-Mehkar, Dist. Buldhana	Attended Training on Market linkages organized by RCT Buldhana.	Details training on the Oil Extraction unit is required
Vidarbha Farmer Producer Company Ltd.	Buldhana	Attended Training on Market linkages organized by RCT Buldhana.	No training is required for the respective FPC
Wardha Farmer Producer Company Ltd.	Wardha	05 Members participated in a training organized by ATMA and the topics covered in the pieces of training are detail information of PoCRA project and various activities.	Training on business development plans and financial management is required
Krishonnati Shetkari Producer Company Ltd.	Waigaon Haldya	10 members participated in a training organized by NABARD, Bajaj Foundation, and Agri Department. The topics covered in training are market linkages and business development.	Further training is required on the Exposure visits and detailed information on various Govt. schemes.
Krushnapeth Farmer Producer Company Ltd.	Kora, Tehsil- Samudrapur, Dist. Wardha	10 members participated in a training organized by NABARD, Bajaj Foundation, and Agri Department. In training market linkages and business development plan topics were covered.	The training required on the topic is Exposure visits and detailed information on various Govt. schemes.
Annadata Shetkari Farmer Producer Company Ltd.	Sonegaon, Tehsil-Deoli, Dist. Wardha	04 members participated organized by Yuva Mitra, Bajaj Foundation, and NCDX. In training market linkages and business development-related topics were covered.	Training on financial management and business development is required.
Rajchandra Farmer Producer Company Ltd.	Sakhardoh, Tehsil-Manora, Dist. Washim	02 members participated in training at Krushi Vigyan Kendra, Karda. The topic covered such as financial	Training on business development is required.



		management and grant for hiring machinery.	
Sai Gajanan Risod Farmer Producer Company Ltd	Chikhali, Tehsil- Risod, Dist. Washim	None of the capacity-building training was attended.	Training on business development is required
PKM Farmer Producer Company Ltd.	Wadi Raytal, Tehsil-Risod, Dist. Washim	01 member participated in the training at Krushi Vigyan Kendra, Karda. It has covered financial management and business development plan.	Training on business development is required.
Painganga Marketing And Farmer Producer Company Ltd.	Ekamba, Tehsil- Malegaon, Dist. Washim	None of the capacity-building training was attended.	Training on business development is required.
Krushidhan Agro Producer Company Ltd.	Kopra Bk, Tehsil- Umarkhed, Dist. Yavatmal	01 member participated in the training. The topics covered are financial management and business development plan.	Processing and Export-Import training is required.
Bhai Namdevrao Farmer Producer Company Ltd.	Wani, Dist. Yavatmal	02 members participated in training at Pune. Topics such as financial management and business development etc. were covered.	Training on technical knowledge and market linkages is required.

Before receiving support under the PoCRA project, the FPCs were conducting pre-harvest activities such as cleaning and grading of grains. The FPCs came to know about the activities to be taken under the PoCRA project through ATMA and Agri. Dept. Officials who provided information about the project activities and application procedures. Colleagues also informed them about the activities and application procedures.

The FPCs received different types of assistance under the PoCRA project, including Custom Hiring Centers (CHC), Godown, Grain Drying and Gram Floor Unit, Dal Mill, Silage Unit, and Auction Shed. 16 FPCs received CHC assistance, while the rest received other types of assistance. They received around 60% subsidies against their project cost.

S. N.	FPC Name	Village	District	Project Cost (Rs.)	Disbursement Amount (Rs.)
1	Sahas Farmer Producer Company Ltd.	Jamathi Ganeshpur	Amravati	19,96,000/-	11,69,574/-
2	Sewarth Farmer Producer Company Ltd.	Murtizapur	Akola	19,85,000/-	11,73,838/-
3	Kapashi Farmer Producer Company Ltd.	Kapsi	Akola	20,0000/-	1150000
4	Ruikhed Agricurve Farmer Producer Company Ltd.	Ruikhed	Akola	18,00000/-	10,91,136/-
5	Shatrunjay Farmer Producer Company Ltd.	Alegaon	Akola	18,00350/-	9,42,336/-

Table 47:	Total	proiect	cost	of 21	visited	FPCs
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6	Wasuputra Farmer Producer Company Ltd.	Raikhed	Akola	18,65,000/-	10,87,926/-
7	Citrana Farmer Producer Company Ltd.	Akot	Akola	16,00000/-	11,31,158/-
8	Chandanshesh Farmer Producer Company Ltd.	Sawana	Buldhana	19,85,000/-	11,00000/-
9	Rajmuktai Farmer Producer Company Ltd.	Konti	Buldhana	16,65,000/-	99,6,000/-
10	Prakashparva Farmer Producer Company Ltd.	Songavhan	Buldhana	19,86,000/-	1191000
11	Vidarbha Farmer Producer company Ltd.	Buldhana	Buldhana	17,96,000/-	10,78,188/-
12	Wardha Farmer Producer Company Ltd.	Wardha	Wardha	18,00000/-	9,53,389/-
13	Krishonnati Shetkari Producer Company Ltd.	Waygaon Haldya	Wardha	20,00000/-	11,86,/-600
14	Krushnapeth Farmer Producer Company Ltd.	Kora	Wardha	18,77,000/-	10,62,145/-
15	Annadata Shetkari Farmer Producer Company Ltd.	Sonegaon	Wardha	10,67,000/-	6,24,000/-
16	Rajchandra Farmer Producer Company Ltd.	Sakhardoh	Washim	19,89,382/-	11,08320/-
17	Sai Gajanan Risod Farmer Producer Company Ltd.	Chikhali	Washim	19,78,000/-	11,86,200/-
18	PKM Farmer Producer Company Ltd.	Wadi Raytal	Washim	19,90,000/-	11,93,820/-
19	Painganga Marketing and Farmer Producer Company	Ekamba	Washim	17,76,750/-	9,72,900/-
20	Krushidhan Agro Producer Company Ltd.	Kopra Bk.	Yavatmal	15,52,000/-	95,6914/-
21	Bhai Namdevrao Farmer Producer Company Ltd.	Wani	Yavatmal	16,00000/-	7,87,740/-

Out of 21 FPCs, 01 FPC has availed the loan from the urban bank, while 21 FPCs have used their own funds in the installation of the activities.

Company	Dist	Bank Loan and Bank	Interest
Prakashparva Farmer Producer company Ltd, Songavhan	Buldhana	8 Lakh , Rajashri Shahu Urban Bank, Mehkar, Dist. Buldhana	8 %

All FPCs supported by PoCRA have started the work. The project-supported agribusiness facilities are accessible to around 7 Directors and 50-60 shareholders of each FPC at a lower rate compared to non-shareholder farmers.



It was noticed that 16 FPCs had created CHCs under the PoCRA project. These CHCs consisted of various machinery such as tractors, sowing machines, ploughs, rotavators, reapers, and spraying machines. It was reported that all the machinery are useful and save time, labour, and money for the farmers. The members and non-members had utilized the machines/implements in their farms on a rental basis. It was found that non-members pay more rent compared to members, and the rent was decided as per the market rate. Initially, some issues were faced, but no major issues were faced in implementation. With regard to the purchase of new equipment, 5 FPCs had prepared a plan for purchasing new implements/machinery, while others had not decided to purchase.

One of the 21 Farmer Producer Companies (FPCs) surveyed in CM-VI, only one FPC in Akola had constructed a Warehouse in Kapashi, which was used exclusively for rental storage of farm produce such as Soybean, Pigeon pea, and Chickpea. The total capacity of the Warehouse was 280 Metric Ton, with an average utilization of 100 MT per year for about 3 months. The percentage loss during storage was around 3-5%. The Warehouse employed an average of 2-3 people for about 30 days, with an average daily wage of Rs. 300 per person.

The FPCs had purchased Soybean crop at a rate of Rs. 4800-5200 per quintal in 2021-22, cleaning and grading were carried out on the purchased produce stored in the Warehouse before selling. The FPCs had planned to sell the produce directly in the market through APMC until soybean was sold out. The operational costs involved only labour costs, as the FPCs do not have a cleaning and grading machine. The income generated depended on the monthly turnover, and the main issue faced in implementing the activity was fluctuation in market rates. Two out of the 21 FPCs established processing units. 'Sevarth' Farmers Producer Company Ltd. carried out cleaning and grading of Chickpea and planned to prepare gram floor from the remaining gram. 'Annadata' Farmers Producer Company Ltd. established a Dal mill unit and processed 50 quintals of Pigeon pea dal and 10 quintals of gram (Chickpea) dal.

#### **Environmental safeguards followed**

It appears that the FPO did not follow environmental safeguards during the project activities. Specifically, during the construction of the Warehouse, it was observed that the FPC did not maintain toilet facility and management of solid and liquid waste. Moreover, none of the FPCs constructed toilet facilities, solid and liquid waste management, or pollution management during the establishment of the activities.

The FPCs have constructed their Warehouses in safe locations with a well-raised height, but they did not consider environmental aspects such as constructing away from drainage channels and wildlife-protected areas.

It was observed that out of 21 FPCs, only 8 have established fire extinguishers for fire safety. Also, it has been observed that 4 FPCs have not put up project display boards mentioning the



support received from PoCRA. Most of the implements/equipment's were found to be in working condition. However, BBF and Threshers were not found at 3 FPCs during the visit. There was no information provided regarding water management strategies.

S. N.	FPC Name	Village	District	Construct ed on raised height (Yes/No)	Fire protectio n systems establis hed (Yes/No)	Project Display Board Prepared (Yes/No)	Status of various implements/equi pment (Yes/No)
1	Sahas Farmer Producer Company Ltd.	Jamathi Ganeshpur	Amravati	Yes	No	Yes	Yes
2	Sewarth Farmer Producer Company Ltd.	Murtizapur	Akola	Yes	Yes	Yes	Yes
3	Kaapashi Farmer Producer Company Ltd.	Kapshi	Akola	Yes	Yes	Yes	Yes
4	Ruikhed Agricurve Farmer Producer Company Ltd.	Ruikhed	Akola	Yes	No	No	Yes, BBF and Drill machines were not found during the visit.
5	Shatrunjay Farmer Producer Company Ltd.	Alegaon	Akola	Yes	Yes	Yes	Yes
6	Wasuputra Farmer Producer Company Ltd.	Raikhed	Akola	Yes	No	Yes	Yes
7	Citrana Farmer Producer Company Ltd.	Akot	Akola	Yes	No	No	Yes, BBF and Drill machines were not found during the visit.
8	Chandanshesh Farmer Producer Company Ltd.	Sawana	Buldhana	Yes	No	Yes	Yes
9	Rajmuktai Farmer Producer Company Ltd.	Konti	Buldhana	Yes	No	Yes	Yes
10	Prakashparva Farmer Producer Company Ltd.	Songavhan	Buldhana	Yes	No	Yes	Yes
11	Vidarbha Farmer Producer Company Ltd.	Buldhana	Buldhana	Yes	No	Yes	Yes
12	Wardha Farmer Producer company Ltd	Wardha	Wardha	Yes	Yes	Yes	Yes

 Table 48:
 Table showing ddetails of facilities available with FPCs



13	Krishonnati Shetkari Producer Company Ltd.	Waigaon Haldya	Wardha	Yes	Yes	Yes	Yes
14	Krushnapeth Farmer Producer Company Ltd.	Kora	Wardha	Yes	No	No	Yes, only Thresher was not found during the visit.
15	Annadata Shetkari Farmer Producer Company Ltd.	Sonegaon	Wardha	Yes	Yes	Yes	Yes
16	Rajchandra Farmer Producer company	Sakhardoh	Washim	Yes	No	Yes	Yes
17	Sai Gajanan Risod Farmer Producer Company Ltd.	Chikhali	Washim	Yes	Yes	Yes	Yes
18	PKM Farmer Producer Company Ltd.	Wadi Raytal	Washim	Yes	No	Yes	Yes
19	Painganga Marketing And Farmer Producer Company Ltd.	Ekamba	Washim	Yes	Yes	Yes	Yes
20	Krushidhan Agro Producer Company Ltd.	Kopra Bk.	Yavatmal	Yes	No	Yes	Yes
21	Bhai Namdevrao Farmer Producer Company Ltd.	Wani	Yavatmal	Yes	No	No	Yes

The project has benefited farmers by providing various activities through FPCs, such as CHC, Warehouse, Cleaning and Grading unit, Dal Mill, Oil extraction unit, Silage unit and Drying Yard. These activities have helped the farmers in completing farming operations within time and the activities are cost-effective, and labour-efficient manner. These activities have also generated income for the FPCs and helped maintain the quality of farm produce. The availability of Tractors had also improved field operations and transportation efficiency.

The FPCs have faced several challenges including difficulties in formation and registration, bank linkages, and arranging their own capital for project implementation. Additionally, there was a lack of awareness about technology and capacity building programs/training. These challenges have hindered the successful implementation of the project activities.

During the discussions it was found that approximately 50% of FPC members were not aware of the FPO portal.

The feedback on the support provided by the PoCRA project staff was positive. They were supportive and provided all the necessary information about the FPCs and their various



activities. The project staff also shared guidelines and provided guidance about the proposal submission.

# Suggestions for the project

It was suggested that the project should provide support in bank linkages and financial help for initiating other activities for the FPCs. It was also suggested for providing activity-wise technical and business development training to increase the capacity of the FPCs and increasing market linkages.



# **Component C: Institutional Development, Knowledge, and Policies**

In order to achieve climate resilience and ensure the intended results from the activities proposed, it is essential to build the capacity of the stakeholders. The component focuses on mainstreaming climate resilience and coordination at the field level. As part of CM-VI, feedback has been taken from various stakeholders on their awareness, capacity building, and understanding of challenges and issues related to environmental safeguards are presented in this section.

# **Exposure Visits, Trainings and Awareness**

#### **Exposure Visits Attended**

The beneficiaries were asked whether they have attended any training provided by the PoCRA and the responses were recorded as out of the total 417 respondents 17.0% have participated in any exposure visit (outside their village) which had been organized under the PoCRA project, while the majority 83.0% have not participated in any such visits.



Figure 50: Exposure Visits Attended

#### **Participation in the PoCRA Trainings**

The beneficiaries were asked whether they have participated in any exposure visit outside their village which was organized under the PoCRA project. The responses were recorded, as out of the 417 respondents, 36.7% answered "Yes" as they are aware of the exposure visits outside of the village and the participation has been done by the respective beneficiaries.



While 63.3% answered "No" as they don't have any information regarding the exposure visits outside the village. This suggests that there was a low level of participation in the training programs provided by PoCRA. It may be important for the project to evaluate and address potential barriers to participation in order to increase the reach and effectiveness of their training programs.



Figure 51: Participation in PoCRA trainings

#### Awareness through IEC

Awareness of the project was also seen through the project information boards put up in the project villages. These information boards are an important part of the IEC as part of the project.

#### **Awareness of Project Information Boards**

The beneficiaries asked whether they were aware of the project information boards installed in their village. Based on the survey, out of the total respondents, 50.1% were aware of the project information board, 17.7% were aware of the VCRMC board, 6.2% were aware of the board detailing activities under the project, 4.5% were aware of the board presenting the water balance activity details of their village, and 21.4% were aware of other boards.





Figure 52: Awareness about the Project Information Boards

Overall, it appears that a significant portion of the respondents were aware of project information boards installed in their village, with the majority being aware of the project information board specifically. However, it is important to note that a sizable portion of the respondents were not aware of these boards, indicating that there may be a need to increase awareness and communication about the project and its activities.

#### Awareness of the Grievance Box for PoCRA

At the Panchayat level, Grievance boxes had also been installed as seen during the CM-VI survey. This is an important aspect as part of the transparency, accountability and safeguards for the project. The beneficiaries were also asked about are they aware of the grievance box for PoCRA Project at Panchayat Office? Out of the total respondents, 36.20% answered "Yes," indicating that they were aware of the grievance box for the PoCRA project at the Panchayat office. 63.80% of respondents answered "No," indicating they were unaware of the grievance box.

Overall, it can be interpreted that a majority of the respondents were not aware of the grievance box for the PoCRA project at the Panchayat office. This suggests that there may be a need for better communication and dissemination of information about the grievance box and its purpose to the community members involved in the PoCRA project.





Figure 53: Awareness about the grievance box

## Status of the Complaint Received Through Grievance Box

As part of the survey, beneficiaries were asked whether they have complained through the grievance box regarding any project issues Out of the total respondents, 5 % answered "Yes," indicating that they had used the grievance box to complain about project issues. 31.20% of respondents answered "No," indicating that they had not used the grievance box for this purpose. The majority of respondents 63.80% answered "Not Applicable," indicating that they did not have any issues to complain about.

Overall, it can be interpreted that only a small proportion of respondents used the grievance box to complain about project issues. This suggests that either the community members did not have any issues to complain about or they were not aware of the existence or purpose of the grievance box. It may be necessary to increase awareness and promote the use of the grievance box as a tool for resolving project-related issues.





Figure 54: Complaints received in Grievance Box

## **Social Media Awareness**

The beneficiaries were asked whether they you ever visited the YouTube channel or Facebook page of the PoCRA project. The responses were recorded as out of the total respondent 36.7% answered "Yes" to the question "Have you ever visited the YouTube channel or Facebook page of the PoCRA project". While 63.3% answered "No". This suggests that a relatively small percentage of the respondents have visited the project's social media platforms.



Figure 55: Project Awareness in Social Media Platform



# **Agro-Met Advisory Services**

Agro-met advisory services are one of the important components of the project that provides weather-based information and advice to farmers to help them make informed decisions about crop management practices. As per CM-VI Survey, the majority of respondents 62.7% received an Agro-met advisory, while the remaining 37.3% did not receive it.

The fact that a significant majority of respondents receive Agro-met advisory suggests that this service was widely available and accessible to farmers in the area surveyed.



Figure 56: Frequency of Agro-met advisory

The above graph shows that the majority of beneficiaries received it at least two to three times a week 22.2% or daily 20.7%, while 15.7% reported receiving it almost once a week. Only a small percentage 2.2% reported receiving it less frequently (fortnightly/monthly), while 1.8% reported receiving it very rarely.

Mode of receiving agro-met advisory	Total	Percent
SMS on mobile	136	48.75%
Through Whatsapp	82	29.39%
Through mobile app	30	10.75%
Newspaper	15	5.38%
Television	12	4.30%
Interactive voice response	2	0.72%
Radio	1	0.36%
Farmer App (PoCRA)	1	0.36%
Total responses	279	

Table 49 : Mode of receiving agro-met advisory

Among the 279 respondents receiving Agro-met advisories, the majority reported receiving it through SMS on mobile (48.75%) or through WhatsApp (29.39%). A smaller percentage reported receiving it through a mobile app (10.75%), Newspaper (5.4%), Television (4.3%), Interactive voice response (0.72%), Radio (0.36%), or a Farmer app (0.36%).



The fact that a large proportion of respondents receive it through SMS on mobile or WhatsApp suggests that these modes of communication may be particularly effective or accessible for farmers in the area surveyed.

Relevance of agro-met advisory	Total	Percent
Useful and relevant	235	52.8%
Not Applicable	184	41.3%
General advice	22	4.9%
Not useful	4	0.9%
Total	445	100.0%

Among those who reported using Agro-met advisory, more than half (52.8%) found it to be useful and relevant, while only a small percentage (4.9%) reported receiving general advice and 0.9% reported that it was not useful. The fact that a majority of respondents who reported using Agro-met advisory found it to be useful and relevant may suggest that the service was meeting the needs of farmers in the area surveyed.



Figure 57: Marketing produce from Agro advisory

Among those who do receive market price information and plan to market their produce, 32.6% reported that they plan to do, based on the market price information they receive from Agro advisory. On the other hand, 26.1% reported that they do not plan to market their produce based on this information.

This data suggests that a significant proportion of farmers who receive market price information from Agro advisory use it to inform their marketing decisions.



Among those who do receive market price information and sell their produce, 29.7% reported that Agro advisory has helped them to realize a better selling price for their produce. Only a small percentage (2.9%) reported that it has not helped them.



#### Figure 58: Preferred mode for receiving agro-met advisory

The above figure shows that the most preferred mode for receiving Agro-met advisory was through SMS on mobile, with 33% of respondents indicating this as their preferred mode. This was followed by through WhatsApp (13.7%) and through a mobile app (7.9%). Only a small percentage of respondents preferred to receive Agro-met advisory through television (2.5%) or newspapers (1.3%).

Overall, the data suggests that mobile-based communication channels, such as SMS and WhatsApp, are the most preferred modes for receiving Agro-met advisory among farmers. This may be due to the widespread availability of mobile phones and internet connectivity in rural areas. The preference for mobile-based communication channels highlights the importance of leveraging technology to improve climate resilient advisory services and provide farmers with timely and relevant information to improve their productivity and income.





Figure 59: Expected frequency to receive Agro-met Advisories

With regard to the question on the frequency of receiving Agro-met advisories, the most common frequency at which they expect to receive Agro-met advisory was daily, with 23.4% of respondents indicating this as their preferred frequency. This was followed closely by twice a week (18.0%) and once a week (17.3%).

The data suggests that there was significant variation in the frequency at which farmers expect to receive Agro-met advisory, with some preferring daily updates while others prefer weekly updates. This may reflect differences in the nature of the crops grown, as well as the availability of resources such as internet connectivity and mobile phones.



Figure 60: Interest in getting Agro-met advisory through a mobile app

With regard to the question about getting agriculture and allied activity-related information services through a mobile app, 63.8% said they would like to get agriculture and allied activity-related information or advisory services through a mobile app, while 36.2% replied negative.



This indicates that a majority of respondents are interested in using a mobile app for getting agriculture-related information or advisory services. Therefore, developing a mobile app for providing such services could be a viable option to reach out to farmers and provide them with relevant information and advisory services. However, it was also important to ensure that the app was user-friendly and accessible to farmers in rural areas, where internet connectivity may be limited.

Sources of receiving agro-met advisory	Total	Percent
NGO/ private organisation	125	32.6%
Agriculture department	124	32.4%
Mobile phone	77	20.1%
КУК	29	7.6%
Newspaper	28	7.3%
Total	383	100.0%

#### Table 51: Sources of receiving agro-met advisory

Table 52: Type of information received

Types of information received	Percent
Weather forecasting	39.9%
Diseases and pest control measures	22.1%
Information related to intercultural operations	15.9%
Use of disease/pest resistant varieties	8.3%
Real time contingency plan	7.9%
Market price information	5.9%
Total	100.0%

The above table shows that response to the question about the type of information they want to be received through agro-met advisory services.

The results indicate that the most common type of information received was weather forecasting (39.9%), followed by diseases and pest control measures (22.1%), information related to intercultural operations (15.9%), use of disease/pest resistant varieties (8.3%), real-time contingency plan (7.9%), and market price information (5.9%).

This suggests that weather forecasting was a key concern for farmers, as it can have a significant impact on crop yields. Information related to diseases and pest control measures was also important, as pests and diseases can cause significant damage to crops if left unchecked. Information related to intercultural operations, which involve managing the space between crops, can help farmers optimize their land use and maximize yields. The use of disease/pest-resistant varieties and real-time contingency plans can help farmers mitigate the



impact of unexpected events, such as disease outbreaks or extreme weather events. Market price information was also valuable, as it can help farmers decide when and where to sell their products to maximize profits.

Benefits from Agro-met Advisory	Percent
Helps in taking timely decisions related to initial stage of crop cultivation	30.9%
(land preparation, sowing, manuring, etc.)	
Helps in deciding irrigation frequency	15.9%
Helps in selection of certified seed variety	19.7%
Helps in selection of crop for intercropping	8.3%
Helps in control of pests	12.0%
Helps in soil health management	4.8%
Helps in preparing a contingency plan	8.3%
Total	100.0%

			-		
Table	53	<b>Benefits</b>	from	Aaro-met	advisorv
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The CM-VI Survey data shows that the agro-met advisory has benefited the farmers in various ways. The most common benefit was helping in taking timely decisions related to the initial stage of crop cultivation, such as land preparation, sowing, manuring, etc., which was reported by 30.9% of the respondents. This was followed by the selection of certified seed varieties (19.7%), deciding irrigation frequency (15.9%), and control of pests (12.0%). About 8.3% of the respondents reported that the advisory helps in selecting a crop for intercropping and in preparing a contingency plan. Only a small proportion of respondents reported that the advisory helps in soil health management (4.8%). Overall, the results indicate that the agromet advisory has played an important role in assisting farmers in making better decisions related to their crop management.

Information or advisory liked to be received	Percent
Climate resilient technology advisory	24.8%
Weather advisory	18.3%
Soil nutrient advisory	9.6%
Natural resource management advisory	9.5%
Certified seed advisory	5.7%
Crop (Food/ Cash/ Plantation) advisory	4.3%



Pesticides (chemical and bio) advisory	4.0%
Fertilizer (chemical and bio) advisory	3.8%
Irrigation advisory	3.7%
Crop pest/ disease advisory	3.2%
Markets for agri-produce advisory	3.0%
Agri-business advisory	2.6%
Organic farming advisory	1.7%
Environment safeguards advisory	1.7%
Poultry/ Goatary/ Fishery advisory	1.5%
Crop residue disposal advisory	1.4%
Horticulture advisory	1.1%
Others	0.2%
Total	100.0%

Based on the CM-VI Survey data, it was observed that the farmers are interested in receiving a wide range of agriculture-related information and advisory services through a mobile app. The top five preferred types of information or advisory services are climate resilient technology advisory (24.8%), weather advisory (18.3%), soil nutrient advisory (9.6%), natural resource management advisory (9.5%), and certified seed advisory (5.7%). Other preferred types of information or advisory services include crop (food/cash/plantation) advisory, pesticides (chemical and bio) advisory, fertilizer (chemical and bio) advisory, irrigation advisory, crop pest/disease advisory, markets for agri-produce advisory, agri-business advisory, organic farming advisory, environment safeguards advisory, poultry/goatary/fishery advisory, crop residue disposal advisory, and horticulture advisory.



# 5 Analysis from Saline Affected Villages

The Purna valley of Vidarbha region was an east-west elongated basin with slight covering to the south occupying the part of Amravati, Akola and Buldhana districts. The development of salinity in these soils had been attributed to the semi-arid climatic conditions that have induced the pedogenetic process of depletion of calcium ions from the soil solution in the form of calcium carbonate. This has resulted in an increase in salinity in the area.

As part of the CM-VI Survey, total 11 Kharpan villages had been covered with total 70 beneficiaries, 17% of the beneficiaries were from DBT pre sanctions, 41% from DBT subsidy released, 19% were FFS Guest farmers and 6% were Host Farmers.



Figure 61: Beneficiary percentage of Kharpan Villages

#### Benefits availed by beneficiaries in Kharpan Area

As per CM-VI Survey it was observed that maximum beneficiaries (23%) Sprinkler system followed by Guest farmers (18.6%). Drip irrigation and NRM/Community Farm Pond projects account for 11.4% and 14.3% of the benefits availed, respectively. The beneficiaries from Kharpan areas availed Host Farmer, FFS Host Farmer Assistance, and Production of foundation & certified seeds of climate resilient varieties account for around 5.7% to 8.6% of



the total benefits. These areas seem to have a moderate level of participation and utilization. The lowest percentages of benefits availed were of Water pumps, Farm Mechanization, Pipes (HDPE/PVC), and SHG, each accounting for approximately 2.9% of the total benefits availed. This suggests that these areas may have had relatively lower participation or utilization compared to other project areas.



Figure 62: Benefits availed by beneficiaries of Kharpan area

# Awareness on Salinity of Soil

As a part of questionnaire in CM-VI, respondents from Kharpan villages were asked about their awareness on salinity of their soil.



Figure 63: Awareness of Salinity



Based on the Survey, out of 70 respondents, 45 (64.3%) were aware of the salinity issues of soil in their area while 25 (35.7%) are not aware. This suggests that a majority of the respondents have knowledge about salinity issues in their area, indicating a level of awareness about soil quality and management.

According to CM-VI survey data, only 8.6% of the respondents have done soil testing, while the majority of them (91.4%) have not. This indicates that there was a lack of awareness and importance placed on soil testing among the farmers in the surveyed area. Soil testing was crucial for identifying the nutrient deficiencies and salinity issues in the soil, which can significantly impact crop yields. Therefore, promoting soil testing and providing support for farmers to access it can be beneficial in improving crop productivity and reducing losses due to soil-related issues.

Regarding practice of No-tillage, out of 70 farmers surveyed, only 2 farmers (2.9%) follow the no tillage practice, while the majority of the farmers (97.1%) do not follow this practice. No tillage was a farming practice that involves planting crops without disturbing the soil through tillage, which can help improve soil moisture content and reduce cost of cultivation.

#### Treatments recommended for reclamation of Saline Soil



The below graph shows the response of what treatment was recommended to reclaim the saline soils:

#### Figure 64: Recommendation for reclamation of Saline Soil

Out of the 41 individuals surveyed, the majority, 17 individuals or 41.5%, indicated that the application of gypsum was recommended. 10 individuals or 24.4% indicated that the application of micronutrients was recommended. 7 individuals or 17.1% indicated that



introducing inter-cropping was recommended, and another 7 individuals or 17.1% indicated that the application of a balanced dose of NPK and Zinc was recommended.

Overall, this data suggests that the most commonly recommended treatment was the application of gypsum, followed by the application of micronutrients. A smaller number of individuals reported being recommended to try inter-cropping or a balanced dose of NPK and Zinc.

# Technologies were demonstrated



#### Figure 65: Technology demonstrated in FFS

Out of the 24 individuals surveyed, the highest percentage of respondents (29.2%) indicated that the application of soil amendments was demonstrated in the project. This was followed closely by irrigation technology at 25.0%, and an equal number of respondents (25.0%) who indicated that intercropping of the technologies were demonstrated. 16.7% of the respondents reported that furrow across to the slope was demonstrated and only 4.2% reported that BBF was demonstrated.

Overall, this data suggests that a variety of technologies were demonstrated in the project, with soil amendments and irrigation technology being the most commonly demonstrated.

#### Reasons for not adopting demonstrated technology

When asked about the reasons for not adopting demonstrated technologies, out of the 14 individuals responses, the highest percentage of respondents (35.7%) indicated that access to necessary resources required for adopting the technologies were not available. 28.6% of the respondents reported that proper information was not provided, which could mean that the



farmers were not aware about the benefits of adoption of technology. 14.3% of the respondents reported that they lacked technical know-how, indicating that the farmers may have needed more training or support to effectively adopt the technology. Another 14.3% of the respondents reported that the improved farm implements were not viable for their farming practices, which could be due to factors such as the cost, maintenance, or suitability of the technology. Only 7.1% of the respondents reported "other" reasons such as poor economic condition, non-availability of implements and poor support.



Figure 66: Technology demonstrated in FFS

Overall, this data suggests that a variety of factors may have contributed to the farmers' decisions not to adopt the demonstrated technology, including access to technology, availability of information, technical know-how, and viability of the technology for their farming practices.

#### **Ground Water Salinity**

To a question on salinity of ground water, as per CM-VI survey data, out of the 70 respondents, 30 (42.9%) answered "Yes", indicating that they believe the ground water in the area was saline. 40 (57.1%) respondents answered "No", indicating that they do not believe the ground water in the area was saline.





#### Figure 67: Salinity of Groundwater

The relatively high proportion of respondents who answered "Yes" may suggest that there was that the ground water in this area was indeed saline. This had a significant implications for agriculture and other uses of water in the area, as saline water is more difficult and expensive to treat and use effectively.

Regarding awareness about well recharge, out of the 70 individuals surveyed, 40 of them responded with "Yes," indicating that they were aware of well recharge. This represents 57.1% of the total sample size. On the other hand, 30 individuals responded with "No," indicating that they were not aware of well recharge. This represents 42.9% of the total sample size.

When asked about information provided for recharging open wells in the project, the data suggested that slightly more than half of the individuals surveyed, 54.3%, received information for recharging open wells in the project. However, almost half of the individuals surveyed, 45.7%, did not receive such information.

With regard to question on resolving of irrigation issues due to salinity, 54.3%, have had their irrigation issues resolved due to salinity. However, almost half of the individuals surveyed, 45.7%, are still facing irrigation issues due to salinity.

# Methods of irrigation used in Kharpan villages





Figure 68: Method of Irrigation in Kharpan area

Out of 77 responses recorded, 36 respondents (or 46.8%) reported using sprinkler irrigation, 28 respondents (or 36.4%) reported using only rainfed irrigation, 8 respondents (or 10.4%) reported using flooding irrigation, and 5 respondents (or 6.5%) reported using drip irrigation. When asked about the reasons for using a specific method of irrigation in Kharpan villages. Out of the 77 respondents, the majority of them, 40 (or 51.9%), reported that they use the method because they are aware of salinity issues in the area. This suggests that salinity was a significant concern for farmers in Kharpan villages and they have selected the method of irrigation that was most suitable for their soil and water conditions.



Figure 69: Method of Irrigation in Kharpan area



22 respondents (or 28.6%) reported that they received technical information from the Agricultural Department, which indicates that farmers in Kharpan villages rely on government support and advice for making decisions about their agricultural practices.14 respondents (or 18.2%) reported that they selected their irrigation method based on the observation of fellow farmers, which indicates that social networks and peer learning are important in shaping the agricultural practices of farmers in Kharpan villages. Only one respondent (or 1.3%) reported "other" reasons for using a specific method of irrigation, which suggests that the reasons for choosing a particular method of irrigation are fairly standardized among farmers in the area.

Overall, this data suggests that farmers in Kharpan villages consider a variety of factors when selecting a method of irrigation, including soil and water conditions, technical advice from the government, and learning from fellow farmers.

#### Issues due to salinity

When asked about the issues due to salinity, 36.8% of the respondents reported water logging and poor drainage is an important issue due to salinity, followed by poor crop production at 31.6%, and increased cost of cultivation at 28.1%.



Figure 70: Issues due to Salinity

Other issues accounted for 3.5% of the responses. It was evident that salinity has had a significant impact on irrigation, leading to various issues in crop production and cultivation costs.



# 6 Socio-Economic Profile of Respondents

As part of the CM-VI survey, beneficiaries were asked about household information from both project and control villages. Social-economic details were captured as part of the household information.

# Gender of the Beneficiary

In CM-VI Survey it was observed that 78% were male and 22% beneficiaries were female in Project area as compared to 21% females and 79% male in Control areas.



Figure 71: Gender of Beneficiaries

Most of the beneficiaries of the Project and Control areas were head of the family as per the graph presented below.





Figure 72: Gender of the head of the family

Out of the total 480 beneficiaries, 92.3% reported that the head of the family was male, while only 7.7% reported that the head of the family was female.

This data highlights the gender disparities in decision-making power and control over resources within households and communities. As the head of the family, the male beneficiaries may have greater control over household resources and decision-making related to agricultural production and income generation. This may have implications for the project's ability to effectively engage and empower female beneficiaries, who may face greater barriers to accessing resources and participating in decision-making processes.

However, it was also important to note that the project may have an opportunity to engage and empower female beneficiaries by targeting interventions specifically towards them. By identifying the specific needs and priorities of female beneficiaries and designing activities that address these needs, the project may be able to create greater opportunities for female participation and engagement.

#### Women Head with Mobile Phone

The data collected from CM-VI survey points out that out of total 37 Women who headed their families, 57% reported that they having their own mobile phone, while 43% reported that they do not have their own mobile phone. In Control 40% Women head had mobiles.





Figure 73: Women head with mobile phone

This data also suggests that there may be limited access to mobile phones among female beneficiaries, particularly those who are heads of family. This may have implications for their ability to access information, communicate with project staff, and participate in project activities. Lack of access to mobile phones may also exacerbate existing gender disparities in decision-making power and control over resources. However, it was important to note that the data only captures the availability of mobile phones among female heads of family, and not among male beneficiaries or other household members. It was possible that other household members, including male heads of family, may have access to mobile phones that can be used by female beneficiaries. Additionally, the project may be able to leverage other communication channels, such as community meetings, to reach and engage beneficiaries who do not have access to mobile phones.

#### **Marital Status of the Beneficiaries**

Out of the total 480 beneficiaries, 91.3% are married, 6.3% are unmarried, 2.3% are widowed, and 0.2% are separated or divorced.

This data can have important implications for the project design and implementation, as different marital status groups may have different needs and priorities. For example, married beneficiaries may have more family responsibilities and may require support for childcare and household tasks, while unmarried beneficiaries may have more time and flexibility to engage in agricultural activities and may require support for building their skills and capacities.

Widowed beneficiaries may also face additional challenges, such as lack of social support and access to resources, which may require targeted interventions. Separated or divorced



beneficiaries may also face social stigma and exclusion, which may require special attention and support.

Overall, this data underscores the importance of understanding the diverse needs and priorities of different beneficiary groups, and the need to adopt targeted and context-specific strategies that address their unique challenges and opportunities. By engaging with and empowering diverse beneficiary groups, the project may be able to create more sustainable and equitable outcomes for all beneficiaries.

# Education qualification of the beneficiaries

It was observed that out of the total 480 beneficiaries, the largest group was those who have completed senior secondary school (25%), followed by those who have completed secondary school (22.3%) and those who have completed primary school (15.4%). The remaining beneficiaries have completed middle school (12.7%), graduate (9.2%), no schooling (6.5%), diploma but not graduate (6.3%), and post-graduate (2.7%).

This data highlights the need for designing and implementing project interventions that are appropriate and tailored to the educational background of the beneficiaries. For example, beneficiaries with no schooling or low levels of education may require basic literacy and numeracy skills to effectively engage in agricultural activities and manage their finances. On the other hand, beneficiaries with higher levels of education may require more specialized training and support to develop advanced skills and knowledge in areas such as agribusiness, marketing, and entrepreneurship.





Figure 74: Educational qualifications of beneficiaries

Overall, the education qualification data highlights the importance of adopting a targeted and context-specific approach to project implementation that takes into account the diverse needs and priorities of different beneficiary groups. By providing appropriate and relevant support and training to beneficiaries at different levels of education, the project may be able to create more sustainable and equitable outcomes for all beneficiaries.

# **Household Category**

The CM-VI survey data was collected for the categorization of households into APL (Above Poverty Line) and BPL (Below Poverty Line) categories. It was observed that in Project villages, out of the total 480 households, 64.2% belong to the APL category, while 35.8% belong to the BPL category. While in case of Control villages 69% households were from APL category and 31% from BPL category.





Figure 75: Household Category

This data was important for understanding the socioeconomic status of the beneficiary households and can be used to design targeted interventions that address the specific needs and challenges faced by households belonging to different economic categories. For example, households belonging to the BPL category may require greater support in terms of access to basic resources such as food, water, and shelter, as well as access to education and healthcare services. In contrast, households belonging to the APL category may require support in terms of developing their entrepreneurial and business skills to increase their income and improve their economic well-being.

Overall, the data highlights the importance of considering the socioeconomic status of beneficiary households in project design and implementation to ensure that interventions are appropriately targeted and aligned with the specific needs and priorities of different beneficiary groups.

# **Family Size**

Out of the total 480 families in Project Villages, 68.1% belong to the joint family category, while 31.9% belong to the nuclear family category. The data highlights the importance of considering the family structure of beneficiary households in project design and implementation to ensure that interventions are appropriately targeted and aligned with the specific needs and priorities of different beneficiary groups.





Figure 76: Family Size

# Sources of income of members of the household

The table provides information on the various sources of income for members of the household of the beneficiary, along with their respective percentages.

Sources of income of members of the household of the beneficiary	Total	Percent
Farming/Agriculture	445	71.9%
Agricultural Labourer	97	15.7%
Non-agriculture labour	15	2.4%
Micro-enterprises (Kirana shops, dhabas, mobile shops, ferry shops etc.)	15	2.4%
Contractual or task-based work	14	2.3%
Skilled worker (tailoring, masonry, electrician, plumbing, carpentry,		
welding, driving, etc.)	7	1.1%
Dairy	6	1.0%
Others	5	0.8%
Goatary	4	0.6%
Salaried worker (Teachers, AWW, etc.)	4	0.6%
NTFP Collection	3	0.5%
Sericulture	3	0.5%
Employment under Govt. schemes (NREGA and others)	1	0.2%
Total (multiple responses)	619	100.0%

Table 55: Source of income of members of the household of the beneficiary

The largest percentage of household members' income (71.90%) comes from Farming/Agriculture. This indicates that agriculture is a significant economic activity for the household. About 15.70% of the household members earn their income as agricultural


labourers. This suggests that some members of the household work as labourers on farms owned by others. Only a small proportion (2.40%) of household members are engaged in nonagricultural labour, which could include various forms of manual labour outside of farming activities. A similar percentage (2.40%) of household members are involved in microenterprises such as Kirana shops (small grocery stores), dhabas (roadside eateries), mobile shops, ferry shops, etc. These are small-scale businesses that contribute to the household income. Around 2.30% of household members rely on contractual or task-based work, indicating that they might be involved in short-term employment or projects. A small portion (1.10%) of the household members are skilled workers, engaged in various trades like tailoring, masonry, electrician work, plumbing, carpentry, welding, driving, etc. Dairy farming is a source of income for 1.00% of the household members. About 0.80% of the household members have income sources not specified in the listed categories. Goat farming contributes to the income of 0.60% of the household members. It was found that 0.60% of the household members have salaried jobs, including teachers and Anganwadi Workers (AWW). With specific to Tribal beneficiaries it was found that 0.50% of the household members gather Non-Timber Forest Products (NTFP) as a means of income.

Sericulture, which involves the rearing of silk-producing insects, contributes to the income of 0.50% of the household members. Only 0.20% of the household members have income sources related to employment under Government schemes, such as the National Rural Employment Guarantee Act (NREGA) and others. Overall, the analysis shows that agriculture-related activities (farming, agricultural labour, and dairy) form the dominant sources of income for the household, with non-agricultural micro-enterprises and skilled labour also playing a minor role.

## Participation in Panchayati Raj Institution

When enquired about if any member of your family part of any district/block level Panchayati Raj Institution, out of the total 480 households surveyed, only 3 households (0.6%) have a member who was part of any district/block level Panchayati Raj Institution. The vast majority of households (99.4%) do not have any member who was part of any district/block level Panchayati Raj Institution. This indicates that there was a low level of participation or representation of the surveyed population in the Panchayati Raj system at the district/block level. It may be worthwhile to explore the reasons for this lack of participation and how to encourage greater engagement and representation in local governance. While in case of Control Area only 0.8% or 2 households from 240 had their family member in Panchayat Raj institution.



# Participation in VCRMC

During CM-VI Survey it was observed that out of 480 beneficiaries, only 5.8% households had atleast one member in VCRMC, while 94.2% households were not involved in VCRMC.

# Participation in SHG



### Figure 77: Participation in SHG

Based on the data provided, it appears that 38.1% of households have at least one member who was part of a Self Help Group (SHG), while 61.9% of households do not have any member in SHG.



# **Participation in FPC**

Figure 78: Participation in FPCs



Based on the survey data, it was observed that out of 480 beneficiaries from Project Areas, only 15.6% or 75 beneficiaries have a member from the same family who was part of a Farmer Producer Company (FPC). The majority of beneficiaries (84.4%) do not have any member from the same family who was part of an FPC.

This information could be useful for understanding the level of engagement of the beneficiaries with FPCs, and could be used to plan interventions aimed at increasing awareness and participation in FPCs among the target population. It could also provide insights into the potential benefits and challenges of promoting FPCs in the area, and help in identifying strategies for improving the functioning of FPCs in the region.

# **Participation in APMC**

In CM-VI Survey it was found that only 3 out of 480 households from Project Areas had a member who was part of an Agriculture Produce Market Committee, which accounts for only 0.6% of the total households. The vast majority, 99.4% of the households, do not have any member who was part of an Agriculture Produce Market Committee. None of the respondents from Control Areas were involved in APMC activities.



# 7 Expert Visits in CM-VI Survey

We had conducted an Expert team visit at RoPA on 17th and 18th January, 2023, as part of the Concurrent Monitoring VI survey. The team included officials from the State Department of Agriculture, such as the Agriculture Officer, the Cluster Assistant, the Agriculture Assistant, and the VCRMC members. In this report, we present the case studies of the villages we visited, along with the specific comments and suggestions from the Experts.

# Case Study 1: Village Nandkhed, Taluka-Patur, District Akola

The field visit was conducted on 18<sup>th</sup> January, 2023 and officials from Department of Agriculture also accompanied the visit along with the team of Experts from NABCONS.

According to Census 2011 information the location code or village code of Nandkhed village is 530404. Nandkhed village is located in Patur tehsil of Akola district in Maharashtra, India. It is situated 6 km away from sub-district headquarter Patur (Tehsildar office) and 25 km away from district headquarter Akola. As per 2009 stats, Nandkhed village is also a gram panchayat. The total geographical area of village is 482 hectares. Nandkhed has a total population of 708 peoples, out of which male population is 390 while female population is 318. Literacy rate of Nandkhed village is 79.80% out of which 84.87% males and 73.58% females are literate. There are about 187 houses in Nandkhed village. As per Maharashtra Agricultural Census on Taluka wise agricultural data of crop cutting experiments from 2016-17 to 2020-21 (www.mahaagric.gov.in), the productivity of major field crops on an average of five years data in Patur taluka is 1030.46 kg/ha soybean, 1073.2 kg/ha cotton, 1657.9 kg/ha pigeon pea, 424.92 kg/ha green gram, 468.88 kg/ha black gram, 808.76 kg/ha sorghum. These crops were





grown under rainfed situation during Kharif season. The productivity of major rabi crops viz; chickpea was 868.74 kg/ha and that of wheat was 931.94 kg/ha in Patur taluka.

Figure 79: Interactive meeting with VCRMC Member at village Nandkhed



Figure 80: A group photo with VCRMC and Beneficiaries at Nandkhed village

Almost 60% area of the village is completely rainfed and very less area is cultivated under Rabi season, due to non-availability water resources structures. Open dug wells are the major source of protective irrigation which is applied to Rabi crops during critical growth stages to achieve maximum yield potential. However, due to introduction of PoCRA project water resources such as drip and sprinkler irrigation systems have been developed significantly in the Akola tehsil bringing more area under the cultivation in especially in Rabi season and thereby increasing the cropping intensity with more income over the year for farmers. It was observed that the productivity of major Kharif and Rabi crops has been improved significantly in village Nandkhed due to introduction of project interventions and adoption of improved technologies and cultivars by the farmers.

**Rainfall pattern of Akola district:** The normal rainfall distribution pattern of this district is 689.5 mm from South West Monsoon, 80.7 mm from North East monsoon(October - December), 28.7 mm from Winter (Jan-March) and 19.7 mm from Summer (April-May) with annual rainfall of 818.6 mm in 46 rainy days. During Kharif 2021, the monsoon rainfall from



June to September was 959.8 mm. This excess rainfall against the normal rainfall, was used effectively as protective irrigation to Kharif and Rabi crops. Rainfall during October-December was 116 mm and the total rainfall was 1075.8 mm, which was higher than total normal rainfall. This rain water has enhanced more area under cultivation in Rabi season due to significant amount of ground water recharge.

Akola					
Month	Actual rainfall (mm)	Normal (mm)	% Deviation		
January	9.7	9	7.8		
February	6.5	10.2	-36.3		
March	14.1	9.5	48.4		
April	2	3.1	-35.5		
Мау	10.9	16.6	-34.3		
June	249.7	150.5	65.9		
July	348.7	212.2	64.3		
August	148.4	215.7	-31.2		
September	213	111.1	91.7		
October	72	52.3	37.7		
November	1.4	20	-93.0		
December	42.6	8.4	407.1		

#### Table 56: Monthly rainfall pattern during Kharif 2021-22 for Akola District

## Status of applications in village Nandkhed:

- 1. Total Registrations : 196
- 2. Total applications: 193
- 3. Pre sanctions: 111
- 4. Direct Benefit Transfers: 54

Agricultural activities implemented in village Nandkhed: The following activities under

the PoCRA projects have been implemented in this village:

- 1. Sprinkler irrigation: 38
- 2. Farm pond: 01
- 3. Seed production: 03
- 4. Horticulture plantation: 03
- 5. Seed Production: 03
- 6. Water pump: 04

**Cropping Pattern:** During Kharif season **a**bout 60-70% of the area in the village is found to be under Soybean cultivation whereas about 20% of area is under Cotton (Bt cotton hybrids) cultivation. Pigeon pea is the second largest crop grown in village intercropped with Soybean in row proportion of Soybean plus Pigeon pea (6:1)/(5:1). The pigeon pea crop of this area



was recently harvested and farmers reported the issue of reduction in yield due to foggy weather situation during early morning hours and high temperatures during afternoon hours as well as lowest nighttime temperatures than the normal temperature during the mid December; the crop has been affected severally specially during the pod development stage and crop is forced for early maturity with undeveloped pods. Generally, the farmers harvest 4-5 quintal per acre yield of this crop in soybean plus pigeon pea intercropping but this year they hardly harvest 1.5 to 2 quintal per acre. Green-gram, Black-gram and Sorghum are cultivated in minor proportions. Sorghum was found to be cultivated mostly for fodder purpose. As regards the Rabi season, Chickpea, Wheat and Rabi Sorghum are the major crops cultivated in village. Soybean followed by Chickpea cropping sequence is adopted in the village on large scale and most remunerative cropping system as mentioned by the farmers. Due to lack of water availability and resources high value cash crops are not cultivated however vegetable crops in minor proportions were grown and sold in the town.

**Soil type and fertility status:** The village soils are mostly black cotton soils falling under vertisols which are medium to deep in depth. The farmers of this village Nandkhed have received soil health cards from Department of Agriculture, KVK's and Dr. PDKV, Akola Agriculture University as narrated by the Agriculture assistant. The black cotton soils are low in available nitrogen, medium to high in available phosphorus and high in available potassium. As regards the micro nutrients soils are found deficient in Sulphur, Zinc, Boron, Iron, Manganese and Copper. Being soybean is the major crop grown in the area farmers are extensively using chemical fertilizers like DAP, SSP and other mix fertilizers like 19:19:19 mix water soluble fertilizer for foliar spray during peek flowering to meet out the nutrient demands.

**Management of soil fertility in saline tract:** Farmers reported that the although the soils are saline there was no ill effect on crop plants was observed. The only constraint they stated is inability to apply heavy irrigations which makes these soils ill drained and accumulation of salts on upper layer of soil. As discussed the farmers reported they are using the FYM after every 2-3 years for maintaining soil fertility status. Availability of FYM is the issue of concern as it is not easily available nearby. Farmers reported growing of leguminous crops like soybean, green gram, black gram, red gram during kharif season and chick pea in Rabi season in cropping system. It was found that farmers are aware about using the bio-fertilizers like Rhizobium culture in case of leguminous crops to enrich atmospheric nitrogen fixation capacity in soil which was suggested by the officials of Agriculture Department. Application of micronutrients in recommended dose can substantially increase the crop productivity. Natural resource management activities enlisted below needs promoted among the farmers to overcome the issue of salinity:

• Application of gypsum 2.5t/ha as an amended with application of FYM .



- In-situ moisture conservation practices such before commencement of rains such as square basins 20 x 20 m, opening of furrows across the slope, opening of contour furrows should be promoted.
- Sub surface tillage with the help of sub-soiler to increase the permeability of soil and to reduce surface runoff and losses of soil nutrients.
- Opening of alternate contour furrows after 2 or 3 rows of crops should be opened after 30 days of sowing to enhance crop productivity and enhanced rain water.
- Contour cultivation with opening of ridges and furrows after 30 days of sowing to enhance crop productivity and enhanced rain water.
- Cultivation of crops with broad bed furrows for *in-situ* moisture conservation and higher productivity in rainfed areas in saline tract.
- Water conservation ditches upto 1.5% slope cross section (1.60 m2) in deep black soils across the slope or on contour 75 to 100 m HI (harvesting index) for improved growth and yield for dryland fruit trees and intercrop in rainfed conditions.
- Adoption of farm pond technologies and use of protective irrigation from harvested rain water and natural resource management activities like widening and deepening of nala's on communal basis.

Integrated disease and pest management: As regards the diseases Kharif and Rabi crops are affected by leaf reddening in cotton, mosaic in soybean, rust and smuts in wheat/sorghum which are most prevailing in recent years. Farmers mostly used the synthetic fungicides for control of diseases in most of the crops. But, in case of chickpea farmers were advised to use Rhizhobium and Trichoderma and Azatobacter in wheat and other cereal crops grown. These bio-cultures are used for seed treatment which has resulted in significant decline in wilt leading to optimum plant population and significant increase in crop productivity. Sucking pest complex (aphids, jassid, thrips and white flies), boll worm complex in cotton (American, Pink and Spotted bollworms), pod borer, stem borer, leaf eating caterpillar, semilooper are the major pests in soybean and other cash crops. Farmers reported the application of biopesticides like Neem-ark (Nimboli ark/Neem oil) with appropriate dose to control these pests resulting into reduction in number of sprays and cost of cultivation as compared to the application of synthetic insecticides. Installed pheromone traps, at regular interval at the rate of 8-10/acre to controlled pod borer. In case of cotton boll worms pheromone traps were adopted by some of the farmers. Use of Pheromone traps in case of cotton resulted in significant reduction in cost of cultivation as compared to application of chemical pesticides like Propenofos/ Cloropyrifos/ Quinolfos at the rate of 20-25 ml per 10 litre of water. The farmers are advised to implement deep ploughing after every three years with a purpose to expose the soil to high temperature during summer through advisories given at weekly



intervals to the farmers through the Agriculture Department. When asked about the crop residue management farmers reported they usually collect the leftover from the fields and burn them in field to control the pathogens and pests. Very few of them reported to use the remains of the crops for composting. Implementation of all these integrated nutrient management strategies has resulted in effective management of pest and diseases with significant reduction in cost of cultivation.

## Implementation of Micro-irrigation:

Sprinkler irrigation: This activity has been found to be implemented in village Nandkhed on large scale with covering majority of the beneficiaries in the village. Total 38 beneficiaries received benefit under PoCRA project. Sprinklers are used for providing the protective irrigation during the prolonged dry spells during kharif and supplemental irrigation to rabi crop during the critical growth stages as the water resources available here are very merge. Major source of irrigation is the dug wells/bore wells which is used for irrigation purpose. One of the farmers named Shri. Mahadev Rajaram Jogtale (Sprinkler set beneficiary) form village Nandkhed reported the increase in yield of about 30-40% in Kharif crops and increase in cropping intensity by 200% because farmers are able to cultivate the Rabi crops which has doubled the cropping intensity. Earlier, due to lack of irrigation facilities farmers were unable to cultivate their lands during rabi but due to introduction of PoCRA the cultivation of second crop in rabi is possible. The water saving through this system occurs to the extent of 16 to 70 % and increase in yield by 3 to 57 % over traditional method of surface irrigation in different agro-climatic situation in India (Indian National Commission on Irrigation and Drainage Report 1998.) the sprinkler irrigation system is being used by the farmers in soybean and cotton if the prolonged dry spell occurs due to uneven distribution of rainfall. It is portable and can used in undulating topography are the added advantages. Due to better ground water table the wells are having sufficient water which can be effectively utilized for protective irrigations. Due to limited sources of water availability there is need to promote the drip irrigation activity in this village.

**Implementation of seed production:** In Nandkhed village, 03 beneficiaries has availed the benefit of seed production as reported by the cluster assistant. There is need to brought more area under seed production with active support from officials of Department of Agriculture among the farmers of Nandkhed village through PoCRA project. Seed production of soybean and chickpea is popular among the farmers. Farmers stated that seed production of these latest improved varieties leading them to earn more net income as compared to selling of ordinary seed, and also being used self for next crop year/season which has also resulted in reduction of cost of cultivation with assured quality of seed. Mostly soybean JS-335, JS-9305, JS-9560 are varieties used for seed production whereas in chickpea JAKI-9218, Phule Vikram



and Rajvijay are the most adopted cultivars. Farmers are receiving 10-15% higher rates for their produce by selling seed instead of selling their produce as raw grain. The average rate received for the grain soybean is around 4500 to 5500 per quintal but the seed production has given the rates of around 600-6500 per quintal and thus the farmers adopting seed production has resulted into 8000-10000 Rs./acre additional net income.



Figure 81: Seed production plot at village Nandkhed

Use of climate resilient varieties not only gives an assured production in changing climate scenario but also gives a price hike for farmers produce and reduction in cost of cultivation if the produced seed is used for sowing in next season. Use of own seed is very important tool for addressing the availability of quality seed to farmers also.



Figure 82: Visit to seed production plot at Nandkhed



However, some of the farmers reported the issue of technical know how about the registration of seed plots with Mahabeej (Maharashtra State Seeds Corporation Limited) for availing the benefit of seed production activity which can be resolved by imparting training through project. Presently (during the field visit) the chickpea was in flower initiation stage and wheat was in tillering initiation stage. Farmers are using the sprinkler system for irrigation, which has been provided from the PoCRA project.

**Implementation of water pump:** Shri. Anil Wasudev Ingle is one of the beneficiary farmer out of total four beneficiaries of water pump. He has installed water pump in open well. The depth of the open well is about 40 ft and diameter is 25 ft. The water level from the surface at present was 5-6 ft. Earlier, due to non-availability of irrigation resources, he was not cultivating whole piece of land during Rabi season but now he has increased cropping intensity to the extent of 200%. Due to irregular electrical supply and non availability during day time the farmers are facing severe problem to operate their irrigation pump during day time and forced to work at night hours. Seeing an advantage and certain issues he suggested to increase the capacity of the solar pump from 3 HP to 5 HP because the sprinkler sets with 8 riser cannot provide sufficient discharge rate and requires more time for irrigation. At present situation this activity is on hold and farmers demanded to re introduce this activity as it is the current need.



Figure 83: Water pump beneficiary at village Nandkhed

**Farm pond**: In this village, three number of farm ponds with standard dimension of 30 m x 30 m x 3 m have been constructed by the farmers with partial financial support from POCRA



project. The harvested rainwater is utilized for irrigating the rabi crops which has significantly increased the yield and cropping intensity as reported by the cluster assistant. Due to lack of water resources available in village the activity of farm pond needs to be promoted vigorously to brought more area under protective irrigation. When discussed about the low adoption of this activity the farmers reported the issue of high initial investment and seepage losses due to unlining. To avoid such water loss, lining of the pond is essential. Growing of trees like moringa, eucalyptus, teak, poplar and other tall growing trees, surrounding the farm pond is an effective measure to reduce water loss from open pond.

## Case Study 2: Village Mhaispur, Taluka Akola, Dist. Akola

The field visit was conducted on 18<sup>th</sup> January, 2023 and officials from Department of Agriculture accompanied with the team of experts from NABCONS.

Mhaispur is a large village located in Akola Taluka of Akola district, Maharashtra with total 633 families residing. The Mhaispur village has population of 2462 of which 1267 are males while 1195 are females as per Population Census 2011. In Mhaispur village population of children with age 0-6 is 289 which makes up 11.74 % of total population of village. Average Sex Ratio of Mhaispur village is 943 which is higher than Maharashtra state average of 929. Child Sex Ratio for the Mhaispur as per census is 966, higher than Maharashtra average of 894.Mhaispur village has higher literacy rate compared to Maharashtra. In 2011, literacy rate of Mhaispur village was 85.69 % compared to 82.34 % of Maharashtra. In Mhaispur Male literacy stands at 92.32 % while female literacy rate was 78.63 %. Mhaispur village of Akola has substantial population of Schedule Caste. Schedule Caste (SC) constitutes 27.46 % while Schedule Tribe (ST) were 2.03 % of total population in Mhaispur village. The total geographical area of village is 959.56 hectares out of which 860.0 hectares in under cultivation.

As per Maharashtra Agricultural Census on Taluka wise agricultural data of crop cutting experiments from 2016-17 to 2020-21 (www.mahaagric.gov.in), the productivity of major field crops on an average of five years data in Akola taluka is 1084.32 kg/ha soybean, 1111.9 kg/ha cotton, 1283.96 kg/ha pigeon pea, 395.52 kg/ha green gram, 378.5 kg/ha black gram, 901.08 kg/ha sorghum. These crops were grown under rainfed situation during kharif season.





Figure 84: Interactive Meeting with Beneficiaries and VCRMC at village Mhaispur

## Status of applications in village Mhaispur:

- 1. Total registrations: 640
- 2. Total applications: 517
- 3. Pre sanctions: 280
- 4. Direct Benefit Transfers: 157

Agricultural activities implemented in village Mhaispur: The following activities under the PoCRA projects have been implemented in this village as reported from cluster assistant:

- 1. Sprinkler irrigation: 83
- 2. Seed production: 09
- 3. Farm pond: 02
- 4. Horticulture plantation: 17
- 5. Poultry rearing: 04
- 6. Goat rearing: 03

**Cropping pattern and soil type:** During Kharif season **a**bout 70-80% of the area in the village is found to be under Soybean cultivation whereas about 10-15% of area is under Cotton (BT cotton hybrids) cultivation. Pigeon pea is the second largest crop grown in village intercropped with Soybean in row proportion of Soybean plus Pigeon pea (6:1)/ (5:1). Green-gram, Black-gram and Sorghum are cultivated in minor proportions. As regards the Rabi season, Chickpea, Wheat and Rabi Sorghum are the major crops cultivated in village. Soybean followed by Chickpea cropping sequence is adopted in the village on large scale and most remunerative cropping system quoted by the farmers. The village is having mostly black cotton soils falling under vertisols group which are medium to deep in depth.

#### Implementation of Micro-irrigation

**Sprinkler irrigation:** This activity has been found to be adopted on large scale with 83 number of beneficiaries. Consistent and high rainfall during past three years has resulted into the availability of sufficient amount of ground water which is utilized for protective irrigations



through dug wells and bore wells as the major sources of irrigation and hence applications under this category has been increased considerably. Shri. Gajanan Namdev Vikhe and Mrs. Venutai Baliram Ingle were the beneficiaries present for discussion. They stated that they have sufficient amount of irrigation water for applying protective irrigations to Kharif and Rabi crops and due to adoption of project interventions there is significant increase in the productivity. Electricity supply is the major constraint raised by the farmers during the discussion. They urged that although they are receiving irrigation resources they are not able to utilize these resources during day time and hence a provision should be made under project to implement the alternative solution of subsidized solar panels to overcome this issue.

**Plantation of Horticulture crop:** In Mhaispur Block, nearly 17 farmers have availed the benefit of horticulture plantation. Major annual crops planted are acid lime, custard apple, guava and sapota. Major constraint under low adoption of horticulture plantation is limited irrigation sources and high initial investment as stated by farmers during discussion. The farmers who have adopted this activity has received trainings through Department of Agriculture reported the cluster assistant. The added advantage of establishing the horticulture plantation is that during initial years of plantation establishment farmers can cultivate the intercrop with the main crop to maintain the year round income. The established horticulture plantation is able to provide sustainable returns all the year round which is very effective measure to cope up with climate vulnerability and hence needs to be promoted vigorously.



Figure 85: Farm pond visit at Mhaispur

**Farm pond**: In this village, 03 farm ponds with standard dimension of 30 m x 30 m x 3 m have been constructed by the farmers with partial financial support from POCRA project. Farm pond



is a dug out structure with definite shape and size having proper inlet and outlet structures for collecting the surface runoff constructed at the lowest portion of the farm area and one of the most important rainwater harvesting structure. Harvested rainwater in the ponds is utilized for providing the supplemental irrigation to the field crops during critical growth stages. These farm ponds are used for irrigating the Rabi crops like chickpea and wheat and resulted into significantly higher yields and increased the cropping intensity of these farmers.

# Perceived benefits of farm pond:

- Collects excess runoff during rainy periods
- Stored water can be utilized for protective irrigation to crops.
- Conserves soil and moisture.
- Useful for cattle for drinking water during drought situations.
- Can be used for facilitating spraying of pesticides.

# Case Study 3: Village Pahurjira, Taluka Shegaon, Dist. Buldhana

The field visit was conducted on 17<sup>th</sup> January, 2023 and officials from Department of Agriculture accompanied along with the team of experts from NABCONS.

According to Census 2011 information the location code or village code of Pahurjira village is 528464. Pahurjira village is located in Shegaon tehsil of Buldhana district in Maharashtra, India. It is situated 19km away from sub-district headquarter Shegaon (tehsildar office) and 5km away from district headquarter Buldhana. Pahurjira has a total population of 5,613 peoples, out of which male population is 2,848 while female population is 2,765. Literacy rate of pahurjira village is 73.28% out of which 78.83% males and 67.56% females are literate. There are about 1,224 houses in pahurjira village. SC population was 11.6% and ST population was reported to be 1.5% with a working population of 49.4%. The total geographical area of village is 2613.35 hectares. Total Cultivatable area of village is 2338 ha and irrigated area is 890.0 ha and main source of irrigation is wells/bore wells.

As per Maharashtra Agricultural Census on Taluka wise agricultural data of crop cutting experiments from 2016-17 to 2020-21 (www.mahaagric.gov.in), the productivity of major field crops on an average of five years data in Shegaon taluka is 819.32 kg/ha soybean, 800.68 kg/ha cotton, 588.40 kg/ha pigeon pea, 493.26 kg/ha green gram, 477.38 kg/ha black gram, 805.86 kg/ha sorghum. These crops were grown under rainfed situation during Kharif season. The productivity of major Rabi crops viz; chickpea was 1171.62 kg/ha and that of wheat is 1762.1 kg/ha in Shegaon taluka.

Almost 61.94% area of the village is completely rainfed and about 38.06 % area is under protective irrigation. Open dug wells/bore wells are the major source of protective irrigation



which is applied to Rabi crops during critical growth stages to harvest optimum yields. It was observed that the productivity of major Kharif and Rabi crops has been improved significantly in village Pahurjira village due to introduction of project interventions and adoption of improved technologies by the beneficiaries of the project. The detailed activities are summarized below.



Figure 86: Interactive meeting with VCRMC Member at village Pahurjira



Figure 87: A group photo with VCRMC and beneficiaries of PoCRA



**Rainfall pattern of Buldhana district:** The normal rainfall distribution pattern of this district is 751.0 mm from South West Monsoon (June to September), 91.0 mm from North East monsoon (October -December), 9.20 mm from Winter (Jan-March) and 8.90 mm from Summer (April-May) with annual rainfall of 860.1 mm in 45 rainy days. During kharif 2021, the monsoon rainfall from June to September was 948.0 mm. This excess rainfall against the normal rainfall, was used effectively as protective irrigation to kharif and Rabi crops. Rainfall during October-December was 149.23 mm which is also higher than the normal and brought more area under cultivation during Rabi season and the total rainfall was 1187.23 mm, which was higher than total normal rainfall.

Buldhana					
Month	Actual rainfall (mm)	Normal (mm)	% Deviation		
January	4.6	3.4	35.3		
February	5.4	2.8	92.9		
March	29.8	3	893.3		
April	2.5	1.3	92.3		
Мау	47.7	7.6	527.6		
June	145	185	-21.6		
July	202	199	1.5		
August	159	245	-35.1		
September	442	122	262.3		
October	113	64.6	74.9		
November	17.93	21.1	-15.0		
December	18.3	5.3	245.3		

#### Table 57: Monthly rainfall pattern during Kharif 2021-22 for Buldhana District

Status of applications in village Pahurjira:

- 1. Total Registrations: 1127
- 2. Total applications: 821
- 3. Pre sanctions: 213
- 4. Direct Benefit Transfers: 97

Agricultural activities implemented in village Pahurjira:

The following activities under the PoCRA projects have been implemented in this village:

- 1. Sprinkler irrigation: 47
- 2. Drip irrigation: 39
- 3. Farm pond: 01
- 4. Seed production: 03
- 5. Horticulture plantation: 03
- 6. Seed Production: 03
- 7. Water pump: 04



**Soil type and Cropping Pattern:** The village soils are mostly black cotton soils which falls under Vertisols are medium to deep in depth having a good moisture holding capacity. During Kharif season about 50% of the area in the village is under cotton cultivation followed by Soybean covering about 40% of the area and other crops which are 10%. Pigeon pea is the third largest crop grown in village intercropped with Soybean and Cotton. Green-gram, Blackgram and Sorghum are grown in very minor proportion. As regards the Rabi season, Chickpea, Wheat, Rabi Sorghum and Maize are the major crops cultivated in village. Soybean followed by Chickpea cropping sequence is adopted in the village and proved to be the very remunerative.

#### Implementation of Micro irrigation

**Sprinkler irrigation:** This activity is covered almost 50 percent of beneficiaries from village Pahurjira covering about 47 beneficiaries under PoCRA project. This facility is utilized for protective irrigation during the prolonged dry spells during kharif and protective irrigation to rabi crop during the critical growth stages. Major source of irrigation is the dug wells/bore wells. Couple of the beneficiary named Shri. Shivdas Paraskar, Mrs. Shila Ugle (Sprinkler set beneficiaries) reported the increase in yield of about 25-30% in Rabi crops as they are able to provide protective irrigation. Earlier, as per their version the rainfed chickpea yielded around 4-5 quintals/acre yield with too much risk involved of crop failure due to moisture stress. But to project interventions the beneficiaries have harvested the yield of 7-10 quintals/acre by applying three protective irrigation during sowing, flowering and pod development stage in chickpea which has almost doubled the yield in Rabi crops with ensured productivity. Considering the lowest rate 4500/- per quintal and yield gross income 31500/- with B:C ratio of around 2.62. Due to better ground water storage some of the farmers had shown their interest in cultivating the summer soybean, groundnut and *Sesamum* crops also and demanded the improved summer cultivars of same crops which are not available with them.

**Drip irrigation:** The drip irrigation activity is adopted by 47 farmers in the project and availed the benefit through PoCRA. The beneficiaries named Shri. Samadhan Rithe and Mrs. Vanita Harankar applied drip irrigation to the cotton crop during kharif season. The variety used is Ajeet-155 and Rashi-659 with the spacing of 4 x 1.5 ft. They reported to received technical guidance from Agriculture Assistant and Cluster assistant for technical know how about the installation and drawing of estimates of drip. Further, the reported to harvest yield of 12-15 qt/acre of yield which was earlier found to be 7-8 q/acre during the years subjected to the drought situations. The yield potential in cotton crop is doubled with significant water saving. Around Rs. 8000-10000/- per quintal rates for cotton were received with an gross income of around 96000/- per acre and net income of about 70000/- per acre with the benefit cost ratio



of 3.69 considering the lowest yield and rate. This higher benefit cost ratio is attributed with the higher yields due to installation of drip and higher rates received for cotton.

**Use of water pump:** Shri. Samadhan Pundlik Rithe is one of the beneficiary farmer out of total 02 beneficiaries of water pump. He has installed water pump in open well. The depth of the open well is about 50 ft and diameter is 25 ft. The water level from the surface at present was 6-7 ft in the month of January. He purchased 5hp motor for lifting and irrigating the cotton crop during Kharif and Maize during rabi season. Farmers urged to initiate this activity again which at present situation is on hold. Drip irrigation is installed for irrigating both the crops during kharif and rabi. Significant yield increase was reported by the beneficiary due to project interventions.

**Implementation of seed production:** In Pahurjira village 06 beneficiaries under seed production received benefits through PoCRA project. Mostly soybean JS-335, JS-9305, JS-9560 are varieties used for seed production whereas in chickpea JAKI-9218, Phule Vikram and Rajvijay are the most adopted cultivars. Farmers reported that they are receiving 20 % higher rates for their produce through seed production activity as compared to traditional grain selling. One of the beneficiary Shri. Shailesh Belokar stated that he had conducted seed production programme on 10 acres with soybean JS-335 and achieved the yield of around 69 quintal yield but due to November rains the seed got rain touched because of which he failed to get the standard germination percentage and his lot for seed production is rejected. Further he stated that he got 5200/- per quintal rate with the gross income of Rs.3,58,800/- was earned from 10 acres of land. The cost of cultivation incurred was around 1,70,000/- and the net income was 1,88,800/- with the benefit cost ratio of 2.11. Training of seed production techniques and guidance about the registration process of seed plots needs to be imparted to encourage the participation of farmers in this activity.



Figure 88: Field visit to seed plot at Pahujira village



**Plantation of Horticulture crop:** In Pahurjira village Shri.Mangesh Shaligram Sangle availed the benefit of horticulture plantation through PoCRA. Orange is the perennial crop planted in 1 ha. Total 277 samplings were planted on 29<sup>th</sup> November, 2022. Plant stand observed is about 95 percent. The spacing of the crop is 6m x 6 m with the drip irrigation system installed as per the guidelines of the project. Since the plantation is in early stage the farmer cultivated the chickpea as the intercrop in this plantation. He had introduced the horticulture plantation of oranges in the village which was earlier not adopted by any of the farmers in the region and will prove as an encouraging activity for increasing participation in this activity. The established horticulture plantation is able to provide sustainable returns all the year round which is very effective measure to cope up with climate vulnerability and hence needs to be promoted.

## Case Study 4: Village Pimpri Adhao, Taluka Nandura, Dist-Buldhana

The field visit was conducted on 17<sup>th</sup> January, 2023 with officials from Department of Agriculture and experts from NABCONS.

Pimpri Adhav is a Village in Nandura Taluka in Buldhana District of Maharashtra State, India. It belongs to Vidarbha region. It belongs to Amravati Division. It is located 45 KM towards North from District headquarters Buldhana. Pimpri Adhav is surrounded by Malkapur Taluka towards west, Jalgaon Jamod Taluka towards North, Shegaon Taluka towards East and Khamgaon Taluka towards South. Pimpri Adhav Local Language is *Ahirani*. The total population of the village was 1029 and number of houses are 239. Female Population was about 49.7%. Village literacy rate is 78.3% and the Female Literacy rate is 36.2%. SC population was 28.8% and ST population was reported to be 2.1% with a working population of 55.8%. Total geographical area of the village is 513.0 ha out of which 505.0 ha is under cultivation and 130.0 ha area is under protective irrigation with open dug wells/bore wells as the main irrigation resource.

As per Maharashtra Agricultural Census on Taluka wise agricultural data of crop cutting experiments from 2016-17 to 2020-21 (www.mahaagric.gov.in), the productivity of major field crops on an average of five years data in Nandura taluka is 1014.82 kg/ha soybean, 862.96 kg/ha cotton, 1477.6 kg/ha pigeon pea, 694.48 kg/ha green gram, 580.42 kg/ha black gram, 958.32 kg/ha sorghum. These crops were grown under rainfed situation during Kharif season. The productivity of major Rabi crops *viz.*, chickpea was 931.94 kg/ha and that of wheat is 2020.94 kg/ha in Nandura taluka.

Almost 74.26% area of the village is completely rainfed and about 25.74% area is under protective irrigation. Open dug wells/bore wells are the major source of protective irrigation which is applied to rabi crops during critical growth stages to harvest optimum yields. It was observed that the productivity of major kharif and Rabi crops has been improved significantly



in village Pimpri Adhao village due to introduction of project interventions and adoption of improved technologies by the beneficiaries of the project. The detailed activities are summarized below.



Figure 89: Interactive meeting with beneficiaries at village Pimpri Adhao

Status of applications in village Pimpri Adhao:

- 1. Total Registrations: 244
- 2. Total applications: 244
- 3. Pre sanctions: 127
- 4. Direct Benefit Transfers: 73

#### Agricultural activities implemented in village Pimpri Adhao:

The following activities under the PoCRA projects have been implemented in this village:

- 1. Sprinkler irrigation: 30
- 2. Drip irrigation: 29
- 3. PVC Pipe: 01
- 4. Seed production: 02
- 5. Horticulture plantation: 02
- 6. Water pump: 02
- 7. Farm Machinery: 01
- 8. Host Farmers: 03

**Soil type and Cropping Pattern:** The village soils are mostly black cotton soils which belongs to Vertisols group are medium to deep in depth having a good moisture holding capacity. The soils are reported to be saline in Pimpri Adhao. During Kharif season **a**bout 60-70% of the area in the village is under soybean cultivation followed by cotton covering about 20-30% of the area. Pigeon pea is the third largest crop grown in village intercropped with Soybean and Cotton. Intercropping of soybean plus pigeon pea (6:1/5:1) and cotton plus pigeon pea (8:1/9:1) are adopted on large scale in the village. Green-gram, Black-gram and Maize are grown in minor proportions on limited areas. As regards the Rabi season, Chickpea, Wheat, Rabi Sorghum and Maize are the major crops cultivated in village. Soybean followed by



Chickpea cropping sequence is mostly adopted and popular practice followed by the farmers. Some of the farmers also reported cultivation of early *Bt.* cotton hybrids which enables farmers to cultivate the second crop during Rabi season. In soybean JS-335, JS-9305, JS-9560, Phule Sangam whereas in cotton *Bt.* cotton hybrids such as Rashi-659, Ajeet-155, Supercot, and Jai are widely grown cultivars. Similarly, in Pigeonpea verities like *Maroti, Charu, Nirmal* and in Maize Pioneer-3396 and Advanta-551 are more popular.

**Management of soil fertility in saline tract:** During discussion farmers reported that they have received the soil health cards from KVK Jalgaon Jamod and they are cautiously applying the chemical fertilizers in recommended quantity and consistently receiving guidance from State Agriculture Department Officials. One of the farmer Shri.Rajesh Ashok Gole had shown his soil testing reports which revealed that the soils in village are having the Ph-8.12, Ec-0.15, OC-0.33, N-147.84 kg/ha, P-18.53 kg/ha and K-497.28 kg/ha. When asked about the reclamation strategies farmers reported that they were aware about the application of Gypsum but the availability is issue as the retailer is not ready to make them available unless it is demanded in bulk in large quantity which is only possible after the collective efforts of farmers which is not happening. Investment cost is also the issue of concern. Project interventions such as application of FYM, organic manures, optimum application of doses of chemical fertilizers, use of biofertilizers, opening of furrows, and sowing across the slope has resulted in significant yield increase in saline soils and training regarding same has been received from State Agriculture Department. Suggestions for soil health improvement in saline areas:

- Application of gypsum 2.5t/ha as an amended with application of FYM.
- In-situ moisture conservation practices such before commencement of rains such as square basins 20 x 20 m, opening of furrows across the slope, opening of contour furrows should be promoted.
- Sub surface tillage with the help of sub-soiler to increase the permeability of soil and to reduce surface runoff and losses of soil nutrients.
- Opening of alternate contour furrows after 2 or 3 rows of crops should be opened after 30 days of sowing to enhance crop productivity and enhanced rain water.
- Contour cultivation with opening of ridges and furrows after 30 days of sowing to enhance crop productivity and enhanced rain water.
- Cultivation of crops with broad bed furrows for in-situ moisture conservation and higher productivity in rainfed areas in saline tract.
- Water conservation ditches upto 1.5% slope cross section (1.60 m2) in deep black soils across the slope or on contour 75 to 100 m HI for improved growth and yield for dryland fruit trees and intercrop in rainfed conditions.



## Implementation of Micro irrigation

**Sprinkler irrigation:** Thirty five beneficiaries from village Pimpri Adhao are covered under this activity under PoCRA. This facility is utilized for protective irrigation during the prolonged dry spells during kharif and supplemental irrigation to rabi crops during the critical growth stages. Major source of irrigation is the dug wells/bore wells. Shri. Sagar Ramrao Adhao expressed his views on availing the benefit under this category. He experienced the increase in yield of about 30-40% in rabi crops due to application of supplemental irrigation. He applied three protective irrigations during at the time sowing, flowering and pod development stage in chickpea which has resulted in achieving the yield of around 8-10qt/acre which was significantly higher than rainfed cultivation of chickpea



Figure 90: Field visit to installed Sprinklers in chickpea

**Plantation of Horticulture crop:** In Pimpri Adhao village Shri.Bhaurao Ramrao Adhao availed the benefit of horticulture plantation through PoCRA for plantation of lime crop in 1.25 acres of land with the total samplings of 130. Plant stand observed is about 90-95 percent with the drip irrigation system installed as per the guidelines of the project. Since the plantation is in initial establishment stage and yields yet to harvest, the farmer cultivated the chickpea as the intercrop in this plantation. Farmer expected to harvest the maximum yields from this plantation during the month of February to June as the rates for the lime during the summer season are very high with high demand and less availability of limes in market.

**Subsidy on farm Machinery:** In Pimpri Adhao village the farmer named Shri. Giriraj Harinayan Rathi received subsidy against the purchase of Tractor through PoCRA project. Farmers stated that he is using it for agriculture operations for his own farm and also for other farms of the village on rental basis. Tractor is one of the most basic and prominent tool of farm



mechanization responsible for curtailing the cost of cultivation and reducing the dependability upon labour. He stated that during the Kharif and Rabi season the tractor was rented for the operations such as ploughing, sowing, spraying and transportation of agriculture produce. Also, the timely conduction of cultural operation in field resulted into significantly higher productivity he does not have rely on laborers as the labour availability is issue of concern to farmers.



Figure 91: With beneficiary of farm machinery

**Implementation of shade net unit:** After visiting the Pimpri Adhao visited it is understood that the shade net unit is established in adjoining village Kokalwadi as reported by the cluster assistant and hence a visit to the shade net unit at kokalwadi is conducted. The farmer who availed this opportunity is Shri. Sangitrao Bhaurao Bhagat who have been effectively using shade net under controlled environmental condition for growing high value vegetable crops like *Shimla mirch (Capsicum Annum.)* as well as cucumber. The total project cost is Rs. 10 lakhs and subsidy received is Rs. 8.48 lakh.

The size of shade net unit is 100 m x 200m. Beneficiary reported to receive all the training and technical guidance from officials of State Department of Agriculture and moral support to generate the high initial investment which is the basic constraint responsible for low adoption of these shade net units. Farmer reported that he earned Rs. 80, 000 as net profit from area of this unit however he expected more returns but he did not get the expected rates for his produce





Figure 92: Visit to Shade Net Unit at Kokalwadi



Figure 93: Expert visit to Shade net unit (another view)

Farmer has shown his interest in cultivating the high value cash crops instead of traditional cash crops. He also planned for cultivation of cucumber in shade net for the upcoming season. Farmer is very contended with the income he received within a small area which has happened due to PoCRA project activities. Further he also reported that, the incidence of diseases and pest is very low which has assured his productivity. With regards to the irrigation water applied it is observed that, the farmers are not well aware about the scheduling of irrigation under drip



system or the amount of irrigation water to be applied to the crops and maintenance of proper humidity and temperature in the shade unit.

## Comments and Suggestions from Agriculture Engineering Expert:

- NRM activities like contour bunding, check dams etc., may be assessed on whether farmers have adopted irrespective of whether the project support is provided. We also may collect data on FFS on these activities.
- 2. We collect data on water pumps, drip irrigation, sprinkler details with approximate discharge details. The survey questions may be revisited to check if any addition required for end term report.
- 3. BBF had good results on certain type of fields especially with soybean. We should get data on soil types and other parameters where much benefits are not noted.
- 4. Tractors and implements usage by farmers who are other than beneficiaries to find out effectiveness of sharing of resources.
- 5. Tractor and other agricultural equipment servicing/repair issues and delays may be recorded.
- 6. Few multi grain seeders or harvesters' usage details and cost/time saving in operations and improvement in yield may be collected if possible.
- 7. Whether net-house/ poly-house beneficiaries have created more interest in other farmers to adopt by getting details of these in both project and control villages (other than beneficiaries).
- How many suffer from inability to do misting in poly houses due to non-availability of power during day time may be gathered to provide alternate solutions like installation of an inverter.
- 9. Bamboo cultivation to reduce erosion- data on issues may be collected.
- 10. Where bore wells as well as open wells are used, the water depletion details during last 4-5 years may be collected.

## Case Study 5: Village Parlam, Taluka Bhatkuli, District Amravati

Expert team visit of Parlam Village was conducted on 17th January, 2023 in the afternoon along with Cluster Assistant, Agricultural Assistant, Agriculture Supervisor, FFS host farmer, *Sarpanch*, farmers and beneficiaries and Krushi Tai of the village. The detailed observations are appended below.

 Profile/ General Discussions with the Farmers/HHs: It was informed that there are 208 number of houses in the village. Total population of the village is 846. Number of males is 441 No and number of females is 405. Total geographical area of the village



is 523.27 hectares. Total cultivable area of 435 hectares is used for Kharif crop. Rabi crop is sown in 105 hectares. There are 368 No persons from scheduled Casts and 2 No from scheduled tribes. Total literacy rate in the village is 80.26%. Total workers are 417, out of which 293 No are males and 144 No Females. There are 338 No Main workers and 79 No marginal workers. In this village 295 No farmers are land holders. The land holding of all the farmers is less than 5 hectares. Some of the landless persons are working as farm labour in this and adjoining villages.

2. Water Resources Management: Farmers use water from the dugwells and borewells for irrigation. Ground water is recharged into the dugwells. There are two rivers-Domi and Uma passing near the village. Farmers having no dugwell are dependent on rains only for the irrigation. Dugwells / borewells along the rivers supply sweet / less saline water. Water in the wells / borewells is available at a depth of about 25 feet from NGL. There are about 15 No dugwells. Some farmers have also registered for the farm ponds.



Figure 94: A group photo of beneficiaries and stakeholders at Parlam village

- 3. Soil Health/ Kharpan Region/Saline Affected Area: The soil in this area is black cotton soil and Medium soil. Top cover of varying thickness is of black cotton soil resting over rocky strata. This village lies in kharpan area.
- **4.** Access to Market/ value chain: The village is well connected with roads. Nearest town Amravati is at about 17 km. This village is about 13 km from Bhatkuli.
- 5. Sign Boards of the Project: There was one sign board installed in the village depicting the benefits available in the PoCRA project.
- 6. Major Observations, Issues and Recommendations in Agriculture:



During the meeting held with the farmers, Officials of Agricultural Department and NABCONS Team, the following points were discussed:

- a) Benefits Transferred to the Farmers: There are 212 No registered farmers. Total 288 number of applications received. Out of these 52 applications were presanctioned. 30 No applications were granted benefit. Subsidy to total 22 No of farmers have been disbursed for the following items:
  - (i) Sprinkler irrigation sets 14
  - (ii) Drip irrigation sets 2
  - (iii) Water Pumps 2
  - (iv) Host Farmer 3
  - (v) Pipes 3

Out of the above beneficiaries, there are 6 No women beneficiaries and 5 No beneficiaries from scheduled tribes. An amount of Rs 4,62,765/- had been disbursed.

b) Losses due to Animal attack: The farmers of Parlam village suffered losses due to animal attacks. They said that Neelgais (Blue Bulls) and Deer from the nearby forest areas invaded their fields at night and ruined their crops. They proposed that high fencing, with or without electric current, could be erected around the individual or the cluster of farms to stop the wild animals from entering and harming the crops. They also mentioned that fencing around a cluster of farms would be cheaper option.



Figure 95: Visit of Sprinkler System at Parlam village

c) **Increase in Yield due to Micro Irrigation:** Farmers are adopting sprinkler irrigation under the PoCRA project. The farmers were aware that water consumption has decreased and their crop yield has increased with the adoption of sprinkler irrigation.



With the saving in water, they are able to sow the Rabi crop. More farmers should be encouraged to adopt micro irrigation.

- d) NRM Activity: It was informed that no NRM activity has commenced in this village. This village was included in the Project in the second phase. There is provision of Graded Bunding in this village for which Pre-sanction has been received. Its tender process has started. After finalization of the tenders, work of constructing graded bunding will commence.
- e) Benefits of Technology and Farm Machinery: The farmers were aware of the benefits of BBF and machinery. By the use of BBF, there is reduction in quantity of seeds and increase in the yield. They informed that with the use of technology in agriculture their cost per acre has decreased by about 10% and their yield of the crop has increased by about 20%. Hence farmers who don't own the machinery like tractor, BBF, etc. they too can utilize the machinery by hiring it and get the higher profit.
- f) Visit to the Farm of Beneficiary-Shubhangi Hemant Ghongade / Gangadhar Gulabrao Ghongade. The total area of the farm of joint family is 15 acre. The first crop was soybean. Second crop is gram sown in 10 acres. In the 3-acre land, orange plants have been planted with intercrop of grams.
  - I. **Dugwell:** There is a dugwell in the farm 24 feet diameter and 35 feet deep. It is lined with concrete. The farm is near to the river. Hence water depth in the pond was about 22 feet below NGL.
  - II. **Drip Irrigation and Sprinkler Irrigation**: Drip irrigation is used for orange plants whereas sprinkler irrigation is used for green grams.
  - III. Installation of Solar Power: These farmers have installed solar panels to generate 5 KW of power. As the electricity is available at night only, they have an alternate source of power during daytime.
  - IV. Optimum use of Farm Subsidy: The farmers have adopted solar power, micro irrigation to increase the yield of the crops and are taking two crops. Due to river flowing nearby, they are getting the water throughout the year. They have purchased the pump through own savings, got the Sprinkler Irrigation sets, Drip Irrigation sets and PVC Pipes from the PoCRA project and obtained Solar Power from *Kusum* Scheme.
- g) SHG for Women and Disabled: There are 18 No SHGs for women. They are getting training in various activities and are able to get deposits of Rs 100/- per month per member.
- h) Delay in Disbursement of Subsidy: Some farmers complained about the delay in disbursement. A farmer, Mr Nikhil Pramod Rai Ghongade, District –Amravati from this Parlam village, Amravati has a land of 2.5 acre. He has procured the sprinkler



irrigation set under the project about 2.5 months ago. He has not received the subsidy yet. This needs to be expedited as some farmers have taken the loan to purchase the materials. The farmers will have to pay higher interest due to delay in payment.

i) Major Popular Items are Put on Hold: Farmers informed that major items like electric pump / diesel pump, connecting PVC pipes, dug wells, and community ponds are put on hold now. Whereas farm ponds and sprinklers are available. Dug wells, Farm ponds and community ponds are also used as rain water harvesting structures and their water is used for irrigation.

Since the provision exist and if found feasible, construction of open dug wells, farm ponds, connecting pipes and pumps may be allowed with the condition that irrigation should be done through Drip / Sprinkler Irrigation only.

- j) Use of Biofertilizers / Vermicompost: Since a lot of farm waste and animal dung is available, there is a need to properly educate the farmers to convert this into biofertilizers. This will reduce their expenses on chemical fertilizers.
- k) Use of Solar Power: As electricity is available for lesser time and that too at night, the farmers should be briefed about the solar power and schemes available for installing solar power at subsidised rates.
- I) Helping Farmers through Knowledge and Finances: It was observed that small farmers cannot get the full benefits of the project as either they do not know the total facilities available in the project or due to lack of funds to be invested before getting the subsidy. Medium and big farmers may have sufficient money and hence can choose the scheme and invest from their own resources. They can afford to get the subsidy later on, whereas small farmers cannot do so. In this village also despite a number of applications, actual beneficiaries are less. Accordingly, a cooperative bank or financing institute may be roped in to help them for getting finances. This way small farmers too can get the full benefits of the Project.
- m) **Training to VCRMC:** Due to elections in the recent past, VCRMC has not been constituted. It was informed that VCRMC will be constituted in the last week of January.
- n) **Training should be given to Krushi Tai and new VCRMC members** to improve their functioning.
- o) Training / Interaction with Farmers: There is need to provide training / interaction with the farmers to apprise them about the Project, its components, various schemes regarding saving of water and energy, drip irrigation, sprinkler irrigation, solar power, biofertilizers, soil health card, etc.



# Case Study 6: Village Wadner Gangai, Taluka: Daryapur, District: Amravati

Expert visit to Village Wadner Gangai was done on 17th of January, 2023 in the forenoon along with Cluster Assistant, Agricultural Assistant, Agriculture Supervisor, Village *Sarpanch* and beneficiary farmers. The detailed observations are appended below.

1. Profile/ General Discussions with the Farmers/HHs: It was informed that there are 1813 number of houses in the village. Total population of the village was 7568. Number of males were 3829 and number of females were 3739. Literacy rate of the village is 79.64%. Total geographical area of the village is 3647.85 hectares. Cultivable area is 3397 hectares for Kharif crop. Rabi crop is sown in 238 hectares. There are 1289 numbers were scheduled Cast and 349 were scheduled tribes. Total workers were 3027, out of which 2234 were Males and 793 Females. Out of total workers, 2820 were main workers and 207 were marginal workers. There are 601 number of farmers in this village. Some of landless persons are working as farm labour in this and adjoining villages.



Figure 96: Visit of Wadner Gangai village

- **2.** Cropping Pattern: The major crops sown in this area are soybean, cotton, moong, urad, toor and grams.
- 3. Water Resources Management: Farmers use water from the dugwells for irrigation. Drinking water is supplied through pipes from the *Shahnoor* Dam constructed across *Shahnoor* river. Farmers having no dugwell are dependent on rains only for the irrigation. A number of farmers are using borewell. Water in this area is saline. Water from the borewells is available between 110 120 feet depth below the NGL. Farmers use only one or two irrigations from the ground water due to its salinity.



- 4. Soil Health/ Kharpan Region/Saline Affected Area: The soil in this area is black cotton soil and Medium soil. Top cover of varying thickness is of black cotton soil resting over rocky strata. This village lies in kharpan area.
- 5. Access to Market/ value chain: The village is well connected with roads. Nearest town Akot is about 15 km and Daryapur is about 22 km. Achalpur and Shegaon towns are also nearby.
- **6. Sign Boards of the Project:** There was one sign board installed in the Gram Panchayat office of the village depicting the benefits available in the PoCRA project.
- **7. Major Observations, Issues and Recommendations in Agriculture**: During the meeting held with the farmers, Officials of the department and NABCONS Team, the following points were discussed:
- a) Benefits Transferred to the Farmers: Total 586 No of farmers are registered. Total 228 No applications were received for getting the benefits. Total 58 No applications presanctioned and 44 No applicants have applied for the benefits from the scheme and 40 farmers have received the subsidy. Farmers have applied for subsidy for following items:
  - i. Sprinkler irrigation sets 32
  - ii. Seed Production 4
  - iii. Farm Machinery-Tractor, BBF, Rotavator, etc. 6
  - iv. Host Farmers 2

Out of the above, there are 5 women beneficiaries. Total amount of Rs 10,60,687/- has been disbursed.

- b) Failure of Kharif Crop: Kharif crop in this area had failed due to excessive rains. All crops-cotton, *urad*, moong etc. had failed. The farmers had insured their crops. But no officer/ official of the insurance company had visited the village. Whereas, farmers in the adjoining villages in Akola District received the insurance money depending on the loss, none of the farmer in this village had been paid the insurance money. Proper coordination between the farmers, agricultural officers and insurance company is required so that the loss of farmers can be timely assessed and the affected farmers are paid the insurance money.
- c) **NRM Activities:** This village was included in the project in the second phase. No NRM activity has been carried out in the village.
- d) Losses due to Animal attack: The farmers of Wadner Gangai village reported that their crops were damaged by the night raids of *Neelgais* (Blue bulls) and Deer from the nearby forest areas. They suggested that high fencing, with or without electric current, could be installed around the individual or the cluster of farms to prevent the wild animals from entering and destroying the crops. They also said that fencing



around a cluster of farms would be more cost-effective. They requested that the Project or any other Government scheme should provide subsidy for fencing.

- e) Increase in Yield due to Micro Irrigation: After the commencement of project, more farmers are adopting sprinkler irrigation under the PoCRA project. The farmers were aware that water consumption has decreased and their crop yield has increased with the adoption of sprinkler irrigation. With the saving in water, they are able to sow the Rabi crop. More farmers should be encouraged to adopt micro irrigation.
- f) Subsidy for Gypsum salt in the Kharpan Area: Farmers and agriculture department officials stated that they are not getting any subsidy for adding gypsum salt in the kharpan area. Agricultural Supervisor informed that if they add about 10 bags of gypsum per acre there will be improvement of the salts in the soil. Some farmers had already added gypsum in this and adjoining villages and the salt concentration in their fields have decreased. There is a need to involve experts of Agricultural University. The Agricultural Experts may get the tests done and advise the quantity of gypsum to be added per acre. Thereafter farmers may be given the subsidy under any future scheme.
- g) Farm Machinery from Other Schemes: Though individual farmers had applied for the tractors but they did not take the machinery under PoCRA. It was informed that farm machinery is also available from Maha DBT. Whereas in PoCRA, both tractor and BBF are to be purchased simultaneously by the farmer, but there is no such condition in Maha DBT. Since farmers can hire the BBF and want only the tractor, hence the farmers have got the benefit of farm machinery from Maha DBT.
- h) Decrease in Cost and Increased Benefits due to Use of Farm Machinery: The farmers agreed that with the use of farm machinery in agriculture their cost per acre has decreased by 7-10% and their yield of the crop has increased by about 20%. Hence farmers who don't own the machinery like tractor, BBF, etc. they too can utilize the machinery by hiring it and get the higher profit.
- i) Visit to SHG, Sankalp Jaivik Shetkari Ghat: The SHG have 21 Members. This SHG has bought one large tractor of 47 HP, one small tractor of 15 HP, BBF and other farm machinery and got the benefits from the project. At present, only members are sharing the machinery. Regarding operation and maintenance of equipments, it was informed that diesel and driver are arranged by the member who is using the machinery. Regarding major maintenance all members will contribute. Presently, the machinery is lying in open. It was informed that a shed / godown is under construction. During discussions, it was suggested that they can give the machinery on hire per hour to the non-members. Funds so generated can be utilized for the maintenance of the machinery.





Figure 97: Visit of SHG at Wadner Gangai village

- j) Requirement of Ginning Mill and Godown: Farmers told that they require a small ginning mill and a pressing unit in their village for the cotton. Also a common Godown is required where they can store their produce and sell it on profit when the rates in nearby markets are higher. It was suggested that they take the above facility through an SHG and cooperative bank.
- k) **Seed Production:** Some farmers have adopted for seed production of soybean, cotton and pulses. They have no difficulty in the sale of their produce.
- I) Major Popular Items are Put on Hold: Farmers informed that major items like electric pump / diesel pump, connecting PVC pipes, dugwells and community ponds are put on hold now. Dug wells and community ponds are also used as rain water harvesting structures and their water is used for irrigation.

Since the provision exist and if found feasible, construction of open dug wells, farm ponds, connecting pipes and pumps may be allowed with the condition that irrigation should be done through Drip / Sprinkler Irrigation only.

- m) **Use of Biofertilizers / Vermicompost:** Since a lot of farm waste and animal dung is available, there is a need to properly educate the farmers to convert this into biofertilizers. This will reduce their expenses on chemical fertilizers.
- n) Use of Solar Power: It was informed that the electricity is available at night from 2:00 am. Some progressive farmers are using solar power through Kusum Scheme. The medium and small farmers should also be briefed about the solar power available and available schemes so that they too can install solar power at subsidised rates.



- o) Helping Farmers through Knowledge and Finances: It was observed that small farmers cannot get the full benefits of the project as either they do not know the total facilities available in the project or due to lack of funds to be invested before getting the available subsidy. Medium and big farmers may have sufficient money and hence can choose the scheme and invest from their own resources. They can afford to get the subsidy later on, whereas small farmers cannot do so. Accordingly, complete information of the project components be given to the farmers so that they can choose the suitable component. A cooperative bank or financing institute may be roped in to help them for getting finances. This way small farmers too can get the full benefits of the Project.
- p) Regular Training to VCRMC members: There are 13 Members of the VCRMC. Two members are from SCs, 2 members are from STs and 5 members were women. VCRMC Meetings are held every month. Training should be given to Krushi Tai and VCRMC members regularly to improve their functioning. Further, it was informed that salary of Krushi Tai is not being paid regularly. It may be ensured that salary of Krushi Tai is paid in time.
- q) Training / Interaction with Farmers: There is need to provide training / interaction with the farmers to apprise them about the Project, its components, various schemes regarding saving of water and energy, drip irrigation, sprinkler irrigation, solar power, biofertilizers, soil health card, etc.

# Comments and Suggestions from Agriculture Economics Expert:

Based on the farm visits and discussions with farmer beneficiaries, Gram Panchayats and VCRMCs in Wadnera Gangai and Parlam villages of Daryapur Taluk in Amaravati district and Damani village of Karanja Lad Taluk in Washim District, we have made the following suggestions after careful deliberation.

S No	Report Section	Observations	Recommendations (if any)
1	Physical and Financial progress	i Based on data collected from sample villages during CM VI expert visit, wide variations were observed ranging from 22 disbursements in Parlam to 163 in Damani village, which translate into Rs.16 lakh in one village to Rs.2.77 crore in another village.	i. Progress of disbursements under various components can be analysed only if component wise/village wise targets and achievements are provided. It is recommended that State level data on physical and financial targets and achievements be provided by the IA
		ii. Discussions with GP and framers in Wadnera Gangai revealed that soil salinity is a hindrance to investments in the village and would welcome treatments like distribution of subsidised gypsum to correct soil pH.	ii. As the progress of the scheme is showing wide variations due to delay in implementation, scheme re-phasing may be done to



		iii. Farm Mechanisation disbursements stopped in Parlam among pending demands.	compensate the time lost due to COVID 19 pandemic. iii. After making a review of progress and achievements village wise, IMA may consider reallocation of funds among various components to accommodate pending demand in certain components and unutilised funds in other in investments.
2.	Implementa tion of intervention s	<ul><li>i. VCMRC with 13 members including SC, ST and women members have been formed in the sample villages which were actively involved in the implementation of PoCRA.</li><li>ii. Training were not received by the VCRMC members.</li></ul>	i. The implementation of POCRA and interventions available has been slowly percolated to the farmers. Therefore, period of PoCRA implementation need re- phasing especially in view of the time lost in COVID 19 pandemic.
		iii. Maintenance grant were received by the VCRMCs and had appointed Krushi Tais on payment.	ii. After making a review of progress and achievements village wise, IA may consider reallocation of funds among
		iv. 97% farmers were registered under PoCRA while application received from 37% and 7% received PoCRA disbursement.	various components to accommodate pending demand in certain components and unutilised funds in certain other
		v. PoCRA application process had been easy, hassle free and disbursements were faster compared to other departmental schemes. This was possible by the personal touch and follow up of the IA and faster DBT process and made PoCRA popular among the farmers.	in investments.
		vi. There was gap in awareness especially for SHGs. Group based Activities like CHC, godowns, dal processing, cotton ginning units, etc. were appeared to be in the proposal stage.	
3.	Verification of assets	Assets disbursed under PoCRA like tractors, rotovators, seed drill, sprinkler sets, etc., were available for verification, were working/kept in working condition and were properly labelled acknowledging the assistance under PoCRA.	Farm mechanisation and processing facilities being assets that increase the net income under climate resilient agriculture, the pending demand in such equipment may be addressed after a proper review at village/taluka level.
4.	Impact of investment s	i. Cropping intensity has increased from 120 to 127 percent in the sample village. The cropping intensity change ranged from 5 to 50 per cent. This was possible because of availability of sprinkler sets that could irrigate more area compared to surface irrigation adopted earlier and possibility of protective irrigation.	i. Create awareness on scientific crop planning to include short duration crops in first crop, early second crop and a possibility of 3rd crop on conserved water. Thus, climate resilient agriculture could result further increase in cropping intensity.
		<ul> <li>II. Irrigation at critical stages of crop growth has resulted in increase in yield of all crops.</li> <li>Yield of Cotton increased from 6 to 9 q/acre Yield of Tur increased from 3.5 to 5 q/acre</li> <li>Yield of soyabean increased from 4to6 q/acre</li> <li>Yield of gram increased from 5 to 7 q/acre</li> </ul>	ii. Efforts needed for increasing crop intensity through water conservation and crop planning. Intensive extension support and farmer education needed on


			climate resilient agriculture.
			Village wise campaigns could be
			organised on rain water
			harvesting and conservation,
			organic matter and soil health,
			use of improved short duration
			seeds, inter/mixed cropping,
			double/triple cropping.
5	Discussion	FPC promoted in Damani village was involved in	New FPCs are to be promoted
	with FPCs	PoCRA facilitating member farmers to avail	under PoCRA villages as there is
		investments like sprinkler sets, supporting seed	already a forum like VCMRC
		production by member farmers. Member farmers	which can anchor group
		could get better yields as also Rs.1500 to Rs.1600	formation and registration.
		per quintal of produce as seed bonus from	
		government.	



# 8 Insights from PoCRA MIS Data

## 8.1 DBT MIS Data

#### Registrations

#### **Registration Status**

As per PMU guidelines, farmers and landless households willing to avail of benefits under the project need to first register themselves in the mobile application exclusively developed for this purpose. It is to be noted that registration does not mean the provision of services/benefits but it is the first step towards applying for any benefit under the project.

Registration of a number of beneficiaries under the PoCRA Project is given in the table below. As per the project MIS Data, the registration started in November 2018 and until 30<sup>th</sup> September 2022, a total of 5,18,242 beneficiaries have registered under the project in the Rest of Project Area (Akola, Amravati, Buldhana, Jalgaon, Wardha, Washim, and Yavatmal districts). The highest number of registrations were made in the Apr 21 – Sep 21 (about 21%), followed by Oct 21 – Mar 22 (18%) and Oct 20 – Mar 21 (17%), Apr 19-Sep 19(14%), Oct 19-Mar 20 (11%).

Time Period	Registra	ations
	Number	%
Nov 18 - Mar 19	32,163	6%
Apr 19 - Sep 19	72,942	14%
Oct 19 - Mar 20	58,997	11%
Apr 20 - Sep 20	35,625	7%
Oct 20 - Mar 21	87,479	17%
Apr 21 – Sep 21	1,07,286	21%
Oct 21 – Mar 22	92,930	18%
Apr 22- Sep 22	30,820	6%
Total	5,18,242	100%

Table 58: Registrations in the Rest of Project Area Districts



The status of District wise total registrations is shown in the table below. As per the data, the highest number of registrations were in Buldhana (24%), followed by Akola (22%), Amravati (18%) Jalgaon (18%), Yavatmal (9%) and Washim (7%) and Wardha showed the least number of registrations to only 2%.

District	Akola	Amravati	Buldhana	Jalgaon	Wardha	Washim	Yavatmal	Total
Registra tions (No.)	115334	91676	124897	94077	12554	34628	45076	518242
Registra tions (%)	22%	18%	24%	18%	2%	7%	9%	100%



Figure 98: District-wise Registrations under DBT

## Applications

#### **Application Status**

Of the total 5,18,242 individuals registered up to September 2022, as many as 3,71,671 individuals (or 73%) applied for one or more benefits until September 2022.

District-wise number of active applications submitted by registered individuals is given below in the table. As in the case of number of registrations, Jalgaon (29%) and Buldhana (24%) districts showed the highest number of applications for benefits under the project and in the other districts, it was 12 to 11% except in Wardha district where it was just 3% only.



Table	60.	District w	vico	Activo	Applications	/+ill	20 00 2022	1
I able (	00.	DISTINCT	vise	ACTIVE	Applications	( 1111	30.09.2022	)

District	Applications	Percent
Akola	43299	12%
Amravati	33155	9%
Buldhana	87684	24%
Jalgaon	109471	29%
Wardha	12552	3%
Washim	41534	11%
Yavatmal	43976	12%
Total	371671	100%

Status of application of male–female in rest of project area. The highest female application was received in Jalgaon (25%), followed by Akola (20%) and lowest application received in Wardha (14%).



Figure 99: District wise male – female Applications

Out of total of 68,586 female applications, social category-wise applications were General (93%), Schedule case (4%), Schedule tribes (3%). Similarly, total of 2,73,718 male applications were General (92%), Schedule cases (5%), Schedule tribes (3%).

The total male-female applications, were highest SC category (24%) in Buldhana and the highest ST category (32%) in Yavatmal.



#### **Disbursement Status**

Out of 3,71,671 applications, disbursements have been made to 1,44,951 applications constituting 39% of the total applications. Total amount disbursed is Rs. 81554.01Lakhs. The highest amount has been disbursed to Jalgaon (Rs. 34320 lakh) followed by Buldhana (Rs. 12041.54lakh) and lowest disbursed district was Wardha (Rs. 2440.31 lakh).

The total individual disbursed beneficiaries of rest of the project area 144951 out of which 80% are male and 20% female. The proportion of disbursement of male & female beneficiaries in overall districts, was lowest in the districts of Wardha (M-3%, F-2%), Washim (M-9%, F-7%) and the highest disbursement was in Jalgaon (M-44%, F-34%) followed by Buldhana (M-23%, F-18%) and the other districts Akola(M-13%, F-13%),Amravati(M-10%, F-13%).



Figure 100: District wise male – female disbursed beneficiaries



## Total Disbursement(Rs.Lakh)



#### Figure 101: Total Disbursements

Activity-wise disbursement status is presented in the figure below<sup>2</sup>. Around 57.88% of the amount has been disbursed for Drip Irrigation (Rs. 28620.75 Lakhs), followed by Shade net House 9.63% (Rs. 4760.24 Lakhs), Sprinkler Irrigation 9.40% (Rs. 4649.64 Lakhs), Farm mechanization 3.68% (Rs. 1821 Lakhs) and Saline & Sodic lands (Farm ponds/ Sprinklers / Water pump) 3.28% (Rs. 1619.65 Lakhs). Rest of the disbursements in activity was less than 3.20%.



Figure 102: Activity wise Disbursement Amount

<sup>&</sup>lt;sup>2</sup> Offline application activity wise disbursement data was not available.



#### Social Category - wise Status

Out of the total applicant's disbursements, 4% were from Schedule Caste (SC) and 2% were from Schedule Tribe (ST) and the remaining 94% from other social categories. The proportion of social category beneficiaries in rest of project area, ST was highest in Yavatmal (30%) and Jalgaon (22%). SC was highest in Buldhana (26%) and Akola (22%). Similarly, other social category was highest in Jalgaon (37%), followed by Buldhana (22%) and Akola (13%) and lowest in Wardha (3%) only.



Figure 103: Social Category wise beneficiaries



Table 61: Village Profile for CM-VI

S	District	Taluk	Village	Cencode	Cluster code	Registration	Applications	Pre sanction	Disbursed	Beneficiary
No									applications	farmers
1	Akola	Akola	Takali Jalam	530008	501_ptr-2_04	216	102	10	5	5
2	Akola	Akola	Bahirkhed	530059	501_pt-19_02	123	86	45	28	18
3	Akola	Akot	Rohankhed	529830	501_ptsp-1_04	203	79	8	7	7
4	Akola	Barshitalki	Mirzapur	530496	501_ptr-4_02	72	97	58	35	27
5	Akola	Murtizapur	Shelu Najik	530189	501_pt-20_01	214	124	24	16	16
6	Akola	Patur	Belura Kh.	530390	501_ptmn-3_03	344	379	91	33	28
7	Akola	Telhara	Khakata	529691	501_pt-7_07	163	77	31	11	9
8	Amravati	Anjangaon	Sarfabad	531845	503_ptc-1_06	89	32	10	7	5
9	Amravati	Bhatkuli	Narayanpur	532847	503_ptb-4_03	45	18	6	5	3
10	Amravati	Chikhaldara	Koylari	531646	503_te-1a_02	202	265	20	8	8
11	Amravati	Daryapur	Shivarkheda	532954	503_ptc-1_04	62	36	14	10	8
12	Amravati	Dhamangaon	Jalgaon	533290	503_wr-7_01	270	255	115	86	64
13	Buldhana	Chikhli	Yewata	529197	500_gp-32a_01	620	1909	619	425	278
14	Buldhana	Jalgaon Jamod	Sawargaon	528220	500_pt-14_06	255	260	96	41	29
15	Buldhana	Lonar	Kaulkhed	529581	500_pg-6_02	104	231	69	51	44
16	Buldhana	Malkapur	Kalegaon Pr.Malkapur	528582	500_ptv-2_02	88	166	58	20	15



17	Buldhana	Nandura	Alampur	528501	500_pt-16_02	292	313	42	26	22
18	Buldhana	Sangrampur	Ladnapur	528312	500_pt-10_02	779	1649	472	150	127
19	Buldhana	Shegaon	Gavhan	528467	500_ptmb-1_02	292	261	114	76	50
20	Jalgaon	Bhadgaon	Shindi	527669	499_te-33_01	339	647	380	100	83
21	Jalgaon	Chalisgaon	Ozar	527792	499_te-35_01	133	215	140	93	78
22	Jalgaon	Erandol	Adgaon	527300	499_te-27_03	1017	2636	811	235	178
23	Jalgaon	Jamner	Pat Khede	528023	499_te-5c_04	206	356	139	56	54
24	Jalgaon	Muktainagar	Kothali	527027	499_pt-13_01	172	228	142	84	72
25	Jalgaon	Raver	Raipur	526932	499_te-7_04	202	284	81	10	10
26	Wardha	Deoli	Bopapur	534304	504_wr-25_04	42	27	12	8	6
27	Washim	Karanja	Kisan Nagar	530981	502_ptkp-1_03	82	137	51	17	14
28	Washim	Manora	Amdari	531137	502_pgaa-3_02	71	92	26	11	11
29	Washim	Washim	Malegaon N. Bhat Umra	531208	502_pga-1_01	251	292	67	43	34
30	Yevatmal	Kelapur	Pimpari Road	543477	510_pgk-5_03	219	274	94	51	38
31	Yevatmal	Yavtmal	Sawargad	542431	510_pgw-1_01	167	423	106	27	24
32	Yevatmal	Ralegaon	Bhimsenpur	543661	510_pgk-1_03	50	96	17	18	10
	Two Extra Vi	llages selected fo	r NRM Activity							
33	Wardha	Deoli	Akoli	534247	504_wr-25_04	152	254	94	43	30
34	Washim	Washim	Pandaw Umra	531207	502_pga-1_01	273	286	106	50	44



# 8.3 FFS MIS Data Total Number of FFS Conducted

As per the MIS data, a total number of 15389 FFS were conducted till Rabi 2021-22. As compare to the total district FFS conducted from Kharif 2018- 19 to Rabi 2021-22, the highest number of FFS were conducted in Amravati (23%), followed by Akola (20%) and Buldhana (18%). Yavatmal (14%), Jalgaon reported 14% and Washim (7%), and Wardha (5%) reported the least number of FFS conducted. Also the pattern was similar as per the table below:

	Distric	t	Akola	Amravati	Buldhana	Jalgaon	Wardha	Washim	Yavatmal	Total
		Kharif	205	380	204	136	66	55	148	1194
	2018-	Rabi	83	96	25	6	19	8	53	290
	19	Total	288	476	229	142	85	63	201	1484
		Kharif	700	780	627	452	160	178	460	3357
	2019- 20	Rabi	282	357	305	184	57	88	210	1483
eason		Total	982	1137	932	636	217	266	670	4840
	2020-	Kharif	773	768	681	402	152	209	470	3455
0		Rabi	315	372	176	254	69	123	235	1544
		Total	1088	1140	857	656	221	332	705	4999
		Kharif	471	477	496	410	128	258	442	2351
	2021- 22	Rabi	301	247	275	257	52	101	151	1384
		Total	772	724	771	667	180	359	593	3735
	Total		3130	3477	2789	2101	703	1020	2169	15389
	Percer	ntage	20%	23%	18%	14%	5%	7%	14%	

#### Table 62: Total FFS Conducted

For Kharif season, crop wise data showed highest number of FFS conducted for Cotton (53.76%) followed by Soybean (41.25%) and Pigeon Pea (Tur) (2.71%). FFS for rest of the crops were less than 2% as per the table below.



Crop Name	Kharif 2019- 20	Kharif 2020-21	Kharif 2021-22	Total FFS	Percentage
Cotton	1728	1903	1493	5124	53.76%
Soybean	1399	1422	1111	3932	41.25%
Pigeon pea (Tur)	88	82	88	258	2.71%
Maize	99	31	28	158	1.66%
Others	32	16	12	60	0.63%
Total	3346	3454	2732	9532	

Table 63: Crop wise FFS Conducted in Kharif Season



#### Figure 104: Crop wise FFS Conducted in Kharif Season

For Rabi season, crop wise data showed highest number of FFS conducted for Gram (95.87%) followed by Rabi Jowar (2.74%) and Vegetables (0.85%). FFS for rest of the crops were less than 0.5% as per the table below.

Crop Name	Rabi 2019-20	Rabi 2020-21	Rabi 2021-22	Total	Percentage
Gram	1443	1400	1317	4160	95.87%
Rabi Jowar	32	39	48	119	2.74%
Vegetables	22	5	10	37	0.85%
Fodder Crop	9	0	5	14	0.32%
Wheat	4	1	4	9	0.21%
Total	1510	1445	1384	4339	

#### Table 64: Crop wise FFS Conducted for Rabi Season





Figure 105: Crop wise FFS Conducted in Rabi Season

## Yield Reported for FFS Plots

Yield data obtained for FFS plots for 2019, 2020, 2021 was compared for both project and control plots. For 2019, the yield data for the plots is presented in the figure below indicating increase in yield in project plots over control plots in most of the cases in 2019. Maximum increase of 26% was reported in Black gram followed by 25% in Green gram. Cotton reported a 4% reduction in yield as compared to control plots.



Figure 106: FFS Crop Yield (Kg/ha)- 2019





Figure 107: Increase in Yield for FFS Plots (2019)

Data for 2020 was taken March 2021. As per the data, an increase in yield for most of the crops was seen in 2020-21. Green Gram reported the highest increase of 28% followed by Black gram 27%. In 2020, cotton reported an increase in yield of 15% over control plots.



#### Figure 108: FFS Crop Yield (Kg/ha)-2020

Pigeon Pea and Soybean showed an increase in yield of 17%. Cotton, Sorghum and Maize reported an increase yield of 15% in FFS plots over control plots.





Figure 109: Increase in Yield for FFS Plots-2020

For 2021-22 Kharif and Rabi season Yield reported of FFS plots and Control Plots. It was seen in data overall crops FFS plots yield reported higher than control plots. The FFS plots avg. the yield of Cotton was (509.47 kg/ha.), soybean (1524.70 kg/ha.)



Figure 110: FFS Crops Yield (Kg/ Ha ) 2021



FFS plots 2021-22 showed that the increase in yield more than 12% as compare to control plots. The major crops, Cotton (16%), Soybean (12%), Pigeon pea(16%), Gram(12%), Green gram(29%) etc.



Figure 111: Increased in yield for FFS plots 2021

## Soil Testing done for FFS Plots

As per the Soil testing MIS data, 39.68% of the testing was done for Cotton plots followed by 30.71% for Soybean and 24.33% for Gram during FFS.





## **Seed Production of Climate Resilient Varieties**

Seed production details of climate resilient variety season wise from 2018 to 2020 is shown in the table below.

Crop Name	Variety	No. of Growers	Grower % crop variety
	Kharif 2018-19		
Black Gram	AKU-10-1, AKU-15, TAU-1,	68	9.7%
Green Gram	BM-2002-1, BM-2003-2, KOPARGAON, UTKARSHA	62	8.8%
Pigeon Pea	BSMR-736, ICP-8863, ICPL-87119, PKV TARA, VIPULA	38	5.4%
Soybean	JS-2029, JS-335, JS-9305, MACS-1188, MAUS- 158MAUS-162, MAUS-71	531	75.4%
Jute	JRO-524	5	0.7%
	Total	704	
	Rabi 2018-19		
Gram	DIGVIJAY, JAKI-9218, PHULE VIKRAM, RAJ VIJAY, RAJ-202, RAJ-203, RAJVIJAY-202, RAJVIJAY-203, RAJVIJAY-204, VIJAY, VIRAT	424	86.0%
WHEAT	GW-496, HI-8663, LOK-1, LOK-2, MACS-6222PDKV- SARDAR, RAJ-4037	59	12.0%
IMP JOWAR	PKV-KRANTI	3	0.6%
IMP RABI JOWAR	REVATI	7	1.4%
	Total	493	
	Kharif 2019-20		
Black Gram	AKU-10-1, AKU-15, JS-335, MU-44, TAI-1TAU-1, UNNATI, VIJAY	220	11.2%
COTTON	AKH 081,RAJAT BT	6	0.3%
Green Gram	BM-2003-02, BM-2003-2, MAUS-158, MAUS-71, PKV- AKM-4PKVM-8802, UTKARSHA	169	8.6%
HY. COTTON	BN-1 BT	4	0.2%
JUTE	JRO-524	34	1.7%

#### Table 65: Seed Production of Climate Resilient Varieties



LITTLE	Phule Ekadashi	1	0.1%
MILLET			
Pigeon Pea	BDN-716, BMSR-736, ICP-8863, ICPL-87119, PKV TARA	144	7.3%
Soybean	JS-2029, JS-335, JS-9305JS-93-05, MAC-S1188, MAUS -71,MAUS-158,MAUS-162,NRC-86	1382	70.3%
TIL	JLT-408	6	0.3%

Total 1966

	Rabi 20-21		
	Total	3673	
Fil	JLT-408	28	0.8%
Soybean	JS-2029, JS-335, JS-9305,JS-93-05, MACS-1188, MAUS 158, MAUS -71,MAUS-162,MAUS-612,NRC-86	2256	61.4%
Pigeon Pea	BDN 716, , BSMR 736, ICP8863, ICPL 87119, MPV-106, P. RAJESHWARI, PKV Tara	262	7.1%
Jute	JRO-524	185	5.0%
IMP COTTON	AKA-5, RAJAT BT	25	0.7%
HY COTTON	AC-738 BT, BN-1 BT	4	0.1%
Green Gram	AKM-8802, BM-2003-02, PKVM-4, Utakarsha	481	13.1%
COTTON	AKA-5, AKA-7, RAJAT-BT	7	0.2%
Black Gram	AKU-10-01, AKU-15, TAI-1	425	11.6%
	Kharif 2020 -21		
	Total	1113	
Jawar	PBN.MOTIPHULE ,REVATI , PHULE SUCHITRA, PHULE VASHUDHA	85	7.6%
Wheat	NIAW-1415, GW-496, HI-8663, LOK-1, LOK-2, MACS- 6222,PDKV-SARDAR, RAJ-4037, Phule Netravati	124	11.1%
	VIJAY, VIRAT , M-35 , Phule Revati		
Gram	PHULE SAMADHAN, DIGVIJAY, JAKI-9218, PHULE	904	81.2%
	Rabi 2019-20		



Gram	AKAW-4627, AKGS 1109, BG-10216, BG-3062, DIGVIJAY, JAKI-9218, KRIPA, PDKV KANCHAN,PHULE VIKARAM,PHULE VIKARANT,RAJVIJAY 202	1170	86.3%
Jawar	PKV KRANTI,PHULE REVATI,M-35-1,PBN MOTI,M- 35,VASUDHA,SUCHITRA,PHULE VASUDHA	26	1.9%
Safflower	PKV-PINK	6	0.4%
Wheat	GW-496, AKAW-4627, HI-8663, PDKV-SARDAR , GW-496 LOK-1, GW-496, PHULE SAMADHAN, MACS-6222, LOK-I	, 144	10.6%
Onion	AFLR	10	0.7%
	То	tal 1356	
	Kharif 2021-22	P	ercentage
BAJARA	ABPC-4-3	1	0.04%
BHENDI	ARKA ANAMICA	1	0.04%
CLUSTERB	EAN GAURI	1	0.04%
COEPEA	PUSA PRAVATI	1	0.04%
COTTON	AKA-5	1	0.04%
JUTE	JRO-524JRO-524	63	2.41%
Green Gram	n BM-2003-02,BM-2002-1,BM-2003-02,BM-2003- 2,PKV-8802,PKV-AKM 4,UNNATI, UTKARSH, UTKARSHA	259	9.93%
Soybean	JS-335,JS-20116,JS-20-116,JS-20-34,JS- 335,JS-93 05,JS-9305KDS-726 (P. SANGAM),MACS-1281,MAUS-158,MAUS- 612,AMS-1001(YG),AMS-MB-5-18,JS-20-94,JS- 20-98,JS-335,KDS-726 (P. SANGAM),	1710	65.54%
SUNHEMP	JRJ-610	2	0.08%
TIL	JLT-408	5	0.19%
Pigeon Pea	BDN-716,BSMR-736,ICP-8863,ICPL- 87119,MPV-106,PHULE-12,PKV-TARA,ICP- 8863	202	7.74%



	Total	1523	
IMP JOWAR	PKV-KRANTI	159	10%
	6222PDKV-SARDAR, RAJ-4037		
WHEAT	GW-496, HI-8663, LOK-1, LOK-2, MACS-	137	9%
	RAJVIJAY-204, VIJAY, VIRAT		
	RAJ-202, RAJ-203, RAJVIJAY-202, RAJVIJAY-203,		
Gram	DIGVIJAY, JAKI-9218, PHULE VIKRAM, RAJ VIJAY,	1227	81%
	Rabi 2021-22		Percentage
	Total	2609	
	TARA,ICP-8863		
	87119,MPV-106,PHULE-12,PKV TARA,PKV-	363	13.91%
DIACK Gram	BDIN-716,BSIMR-736,ICP-8863,ICPL-		

## **Area under Seed Production**

Area under seed production for major crops is given in the figures below. Total area in Karif 2018-19 was 1860.4 Ha whereas in Rabi it was 1278.8 Ha. Majority of the area was under Soybean.



Figure 113: Area under Seed Production (2018-19)





Figure 114: Area under Seed Production 2019-20

Area under seed production for 2019-20 Kharif and Rabi season was 5177.09 Ha and 3375.68 ha respectively, signifying an increase of around 178% in Kharif and 164 % in Rabi season. This is possible due to the extensive awareness and project activities done as part of the project. The area under seed production in year 2020-21 in kharif and Rabi season was 8440.05 ha. and 3863.84 ha. respectively. In kharif soybean was major seed production crop ( 59.7%)and Rabi Gram was major seed production crop ( 84.8%)





Area under seed production in kharif 2021-22 was 6568.6 Ha. The major seed production was Soybean (70%) followed by Pigeon pea(8.11%), etc. Area under seed Production in Rabi 2021-22 was 2276 ha. The major production in rabi was Gram 81% followed by Rabi Jawar 10%, Wheat 9%.



Figure 115: Area of seed Production 2021-22

## 8.4 FPCs/SHGs/FIGs

In this sub section, the status of support received by FPOs is presented. The figure below highlights the number of proposals that were sanctioned and disbursements made.

Total number of applications for FPOs (FPC, SHG, FIG) till September 30, 2022 were 901. Out of this, disbursement has been made for 353 applications. The total number of FPOs disbursements were 306 out of 728 applied. The highest number of applications were from Akola (335), followed by Washim (183), Buldhana (124), Amravati (108), Jalgaon (66), Wardha (46) and Yavatmal (39).

Overall, 39.2% of the disbursements have been completed for the applications for FPOs. Highest disbursements were reported in Akola (134), Washim (84), Buldhana (38), Amravati (31), Wardha (30), Yavatmal (13).





Figure 116: No. of proposals Sanctioned for FPCs

The total disbursement for the FPOs in Rest of Project area up to 31 March 2022 was Rs. 3405.68 lakh. The highest disbursement district was Akola (37%), followed by (23%), Buldhana (15%), Jalgaon (8%), Amravati & Wardha (7%) and the lowest was Yavatmal only (3%).



Figure 117: FPOs District-wise disbursement %



	Number of Proposals			Total	Total
Activities	Farmers group	FPC	SHG	Proposal	d (Lakh)
Custom Hiring Centre (CHC)	45	32	202	279	2541.12
Godown	2	9	20	31	556.84
Other Agribusiness Activity	1	8	8	17	127.76
Post harvest/ Processing unit	2	10	14	26	179.97
Grand Total	50	59	244	353	3405.68

#### Table 66: Total Disbursements- FPCs/SHGs/FIGs

For FPCs/SHG/FIGs, total number of proposals sanctioned till March 31, 2021 were 353. Details of the amount disbursed for FPCs/SHGs/FIGs is presented in the table above. Major business activities are Custom Hiring Centers, Construction of Godown, and other agribusiness activities. Total amount of Rs. 3405.68 Lakhs has been disbursed. Majority of the disbursements (72.5%) have been made for Custom Hiring Centers, followed by Construction of Godown (16%).

## 8.5 VCRMC & Krushi Tai

As of September 30, 2022, 99% (1635) of the VCRMC were formed out of total 1650 Gram Panchayats, covering 2514 villages. E-gram sabha has been conducted in 23% cases. Total 1744 Krushi Tai have been appointed in Rest of Project Area as of September 30, 2022.

S. No	District	Villages	Gram	Existing	E-gram	No. of
			Panchayats	functional	sabha	Krushi
				VCRMC	conducted	Tai's
1	Akola	498	310	308	75	209
2	Amaravati	532	283	282	3	388
3	Buldhana	441	309	309	188	317
4	Jalgaon	460	355	351	97	381
5	Wardha	125	65	65	1	93
6	Washim	149	116	115	14	117
7	Yavatmal	309	212	205	0	239
	Grand Total	2514	1650	1635	378	1744

#### Table 67: Status of VCRMC & Krushi Tai

## **1.1 Training and Capacity Building**

## **Training Activities**

The details of trainings attended by the different stakeholder under the PoCRA project is indicated in the Table below. In total 36489 events have been conducted till March 31, 2022. Total 424634 + participants have been trained under the project. Of the total members who attended trainings, 72.29% were male and 27.71% of them were female members.

District	No. of Event	Male Particip ants	% Male	Female Particip ants	% of Female	Total Particip ants	Others	Grand Total	
Akola	9793	50117	75.13%	16588	24.87%	66705			
Amravati	4473	49370	72.51%	18717	27.49%	68087	Various online		
Buldhana	9547	78690	70.03%	33681	29.97%	112371	<ul> <li>training &amp;</li> <li>Workshops</li> <li>like</li> <li>KT+FPO/SHG</li> <li>+ Water</li> </ul>	training & Workshops	
Jalgaon	5126	42653	71.51%	16992	28.49%	59645		Total Participants + Others	
Wardha	1510	20066	73.89%	7091	26.11%	27157	<ul> <li>balance+</li> <li>FFS+</li> <li>Management</li> </ul>		
Washim	2147	20021	69.33%	8857	30.67%	28878	of Saline soil		
Yavatmal	3893	46051	74.53%	15740	25.47%	61791	-		
Grand Total	36489	306968	72.29%	117666	27.71%	424634	165483	590117	

#### Table 68: Training Activities

\*RoPA area online training participant's details calculated by overall district wise percentage as discussed with social expert.

## **Exposure Visits**

In total, 189 exposure visit events were organized for total of 2965 participants. Out of the total participants, 63.5% were male and 36.5 % of them were female.

Table 69: Exposure Visits								
District	Total No. of Event Organized	Male Participants	% male	Female Participants	% Female	Total Participants		
Akola	1	13	65.0%	7	35.0%	20		
Amravati	8	109	86.5%	17	13.5%	126		
Buldhana	73	618	56.8%	470	43.2%	1088		
Jalgaon	4	34	54.8%	28	45.2%	62		
Wardha	67	708	63.8%	402	36.2%	1110		



Washim	21	195	65.0%	105	35.0%	300
Yavatmal	15	205	79.2%	54	20.8%	259
Grand Total	189	1882	63.5%	1083	36.5%	2965



# 9 RFID Indicators for CM-VI

Table 70: RFID Indicators for Concurrent Monitoring Round-VI

## **PDO Level Indicators**

S No (as per PAD)	Indicator(s)	Definition	Methodology	Frequency of Measurement	CM-VI Value (till 30 <sup>th</sup> September 2022)
5	Direct project beneficiaries: number of farmers reached with agricultural assets of services Number of farmers reached with agricultural assets or services (% of female)	This indicator measures the number of farmers who were provided with agricultural assets or services as a result of project support.	<ul> <li>The list of total beneficiaries under the project in the Rest of the Project area was taken from the MIS data till September 30, 2022</li> <li>For DBT beneficiaries, and FFS beneficiaries (HF &amp; GF), Training/Exposure visits, online training, and workshop conducted</li> <li>Out of this, total female beneficiaries are filtered</li> </ul>	Semi-Annual	<ul> <li>Overall: 9,79,588 (Females-19%)</li> <li>Total DBT Farmers: 99,262 (Females-24%)</li> <li>Total Host Farmers: 7324 (Females- 15%)</li> <li>Total Guest Farmers: 2,55,250 (Females- 18%) Total Participants in training/exposure visits: 6,17,752 (Females-20%)</li> </ul>



S No (as per PAD)	Indicator(s)	Definition	Methodology	Frequency of Measurement	CM-VI Value (till 30 <sup>th</sup> September 2022)
			and % was calculated		
			accordingly.		

# Intermediate Outcome Indicators - Component A: Promoting Climate-resilient Agricultural Systems

No	Indicator(s)	Definition	Methodology	Frequency of Measurement	CM-VI Value
6	Farmers adopting improved agricultural technology Farmers adopting improved agricultural technology promoted	This indicator measures the number of farmers who have adopted an improved agricultural technology promoted by activities supported by the project	<ul> <li>The calculations are done from the primary data captured through beneficiary questionnaires in Project &amp; Control Villages</li> <li>Adoption of at least one of the improved agriculture technology was considered based on the technologies asked in the Beneficiary questionnaire</li> <li>Total of the technology adopted was calculated and % calculated with the overall total beneficiaries surveyed</li> </ul>	Annual	<b>P-62%, C-53%</b> (These results are based on field surveys in 32 project & 16 control villages)

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No	Indicator(s)	Definition	Methodology	Frequency of Measurement	CM-VI Value
7	Improved water-use efficiency at the farm level Area provided with new/improved irrigation or drainage services (in ha)	This indicator measures ha the total area of land provided by the project with new or improved irrigation or drainage services	<ul> <li>The list of Activities under Improved water- use efficiency (Sprinkler, Drip, Pipes, Water Pumps, Farm Ponds, Wells &amp; Recharge Structures) activity under the project was taken from the MIS data till September 30, 2022</li> <li>For Sprinkler &amp; Drip Irrigation, the maximum area mentioned under the activity was taken</li> <li>For Pipes, Water Pumps, Farm Ponds &amp; Well Recharge, an area of 1ha had been assumed</li> <li>Total area under all the above activities mentioned was calculated</li> </ul>	Annual	<ul> <li>Total Area- 1,25,903 ha</li> <li>Area under Sprinkler: 42568 ha</li> <li>Area under Drip: 64939 ha</li> <li>Area under Water pump &amp; sprinkler: 428 ha</li> <li>Area under Pipes: 8195 ha</li> <li>Area under pumps: 9011 ha</li> <li>Area under farm ponds:389 ha</li> <li>Area under well &amp; recharge structure: 373 ha</li> </ul>
8	Improved availability of surface water for agriculture Surface water storage capacity from new farm and community ponds (in 1,000 m3)	This indicator measures the surface water storage capacity created with to project- supported farm and community ponds.	<ul> <li>The list of individual new farm ponds constructed under the PoCRA project was taken from the MIS data till Sep 30, 2022</li> <li>Volume for total 83 farm ponds &amp; 55 community farm ponds was calculated individually as per the standard guidelines under PoCRA</li> </ul>	Semi Annual	Total Storage Capacity under new & community farm ponds: 976.1`7 (1000 m <sup>3</sup> ) Storage Capacity under New Farm Ponds: 724.22 (1000 m <sup>3</sup> ) Storage Capacity under Community Farm Ponds:





No	Indicator(s)	Definition	Methodology	Frequency of Measurement	CM-VI Value
			<ul> <li>Total volume was taken as the Storage Capacity under new &amp; community farm ponds created</li> </ul>		448 (1000 m <sup>3</sup> )
9	Enhanced Soil Health at Farm Level Area with GAPs for improved management of saline and sodic soils (in ha)	This indicator tracks the farm production area in ha where Good Agricultural Practices (GAP) are applied by farmers for improving management of saline and sodic soils in project villages	<ul> <li>The list of saline &amp; sodic activities under the PoCRA project was taken from the MIS data till Sep 30, 2021</li> <li>In Saline &amp; Sodic villages, GAPs are taken as FFS Conducted, Drip, Sprinkler, Farm Ponds &amp; Water Pumps</li> <li>For Sprinkler &amp; Drip Irrigation, the maximum area mentioned under the activity was taken</li> <li>For Pipes, Water Pumps, an area of 1ha had been assumed</li> <li>Total area covered under the above activities was taken as the GAPs adopted in Saline &amp; Sodic Villages</li> </ul>	Semi Annual	48,114.96 ha



## Intermediate Outcome Indicators -Component B: Climate-smart Post-Harvest Management and Value-chain Promotion

No	Indicator(s)	Definition	Methodology	Frequency of Measurement	CM-VI Value
10	Seeds supply: Promotion of climate resilient crop varieties Oilseeds (soybean), Pulses (pigeon, chickpea) production area under cultivation w/ certified seeds of improved varieties (Share in %)	This indicator measures the share of production area in the project with oilseeds and pulses that was cultivated using certified seeds of improved varieties.	<ul> <li>The calculations are done from the primary data captured through beneficiary questionnaire in Project &amp; Control Villages</li> <li>Area under Climate Resilient Variety for three major crops (Chickpea, Pigeon pea &amp; Soybean) was determined from total responses</li> <li>Total area under the three crop was taken</li> <li>% was calculated by dividing (Area under Climate Resilient Variety/Total Area under the three Crop)</li> </ul>	Annual	Overall P- 85%, C- 81% Soybean P-83%, C-83% Chickpea P-87%, C-87% Pigeon pea P-68%, C-69% (These results are based on field survey in 32 project & 16 control village)
11	Number of project supported FPCs with growth in annual profits	This indicator reports the number of project-supported Farmer Producer Companies with growth in annual profit	<ul> <li>List of FPCs for CM-V was taken from PMU</li> <li>Audited Financial Statements of the FPCs was obtained during the survey</li> <li>Number of PoCRA supported FPCs reporting profit are taken</li> </ul>	Annual	Out of total 21 FPCs 10 FPCs showed profits, while 05 FPCs had suffered loss and 05 FPCs recorded no profit/loss in FY 2021-22.



No	Indicator(s)	Definition	Methodology	Frequency of Measurement	CM-VI Value
14	Number of approved participatory mini watershed plans implemented	This indicator reports the number of approved parti cipatory mini watershed plans im plemented	<ul> <li>The list of CDPs &amp; VDPs approved under the PoCRA project in Rest of Project area was taken from the MIS data till Sep 30, 2020</li> <li>The data was taken for Phase-I villages where Micro-planning had been completed</li> </ul>	Semi Annual	<b>No. of Approved Participatory</b> <b>mini watershed plans: 68</b> (Total 687 villages as part of Phase-I)



# Annexure-I: Verification of Agri-Business Assets of Project Supported Beneficiaries during CM-VI Survey

Sr. No.	FPC Name	District	Taluka	Village	Activity	Remarks	Asset Verification Photographs
1.	Sahas Farmer Producer company Ltd	Amravati	Warud	Jamathi Ganeshpur	Establishment of Custom Hiring Centre	Activity has observed in working condition.	
2.	Sewarth Farmer Producer company Ltd	Akola	Murtizapur	Murtizapur	Seed Processing Shade/ Drying Yard & Food Processing Unit	Activity has observed in working condition.	
3.	Kapashi Farmer Producer company Ltd	Akola	Akola	Kapashi	Construction of Godown/ Small Warehouse	Activity has observed in working condition.	Here Hare Hare Hare Hare Hare Hare Hare



4.	Ruikhed Farmer Producer company Ltd	Akola	Akot	Ruikhed	Establishment of Custom Hiring Centre	Activity has observed in working condition.	Later 21 Not heave
5	Shatrunjay Farmer Producer company Ltd	Akola	Patur	Alegaon	Establishment of Custom Hiring Centre	Activity has observed in working condition.	
6.	Wasuputra Farmer Producer company Ltd	Akola	Telhara	Raikhed	Establishment of Custom Hiring Centers .	Activity has observed in working condition.	

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7.	Citrana Farmer Producer Company Limited	Akola	Akot	Akot	Establishment of Custom Hiring Centre	Activity has observed in working condition.	
8.	Chandanshesh Farmer Producer company Ltd	Buldhana	Chikhali	Sawana	Silage Unit	Activity has observed in working condition.	Hande 24 ACCE Londer 10 ATER Londer 10 ATER
9.	Rajmuktai Farmer Producer company Ltd	Buldhana	Khamgaon	Konti	Establishment of Custom Hiring Centre	Activity has observed in working condition.	With Rest 2001/1           Lander 2001/2



10.	Prakashparva Farmer Producer company Ltd	Buldhana	Mehkar	Songavhan	Establishment of Custom Hiring Centre	Activity has observed in working condition.	Later 12:0278           Exercise 13:0278           Exercise 13:028           Exercise 14:028           Exercise 14:028
11.	Vidarbha Farmer Producer company Ltd	Buldhana	Buldhana	Buldhana	Establishment of Custom Hiring Centers .	Activity has observed in working condition.	
12.	Wardha Farmer Producer company Ltd	Wardha	Wardha	Wardha	Establishment of Custom Hiring Centers .	Activity has observed in working condition.	

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13.	Krishonnati Shetkari Producer company Ltd	Wardha	Samudrapur	Waygaon Haldya	Establishment of Custom Hiring Centre	Activity has observed in working condition.	HARDING TO A CONTRACT OF THE RESULT OF THE R	American American
14.	Krushnapeth Farmer Producer company Ltd	Wardha	Samudrapur	Kora	Establishment of Custom Hiring Centre	Activity has observed in working condition.	Anne 8 86 Hanne 7 Market Hanne 7 Market Hannet Hanne 7 Market Hanne 7 Market Hanne 7 Market Hann	And 1987 Here Right Hard Start Here Right Hard Hard Here Right Hard Hard Here Right Hard Hard Hard Hard Hard Hard Hard Hard Hard Hard Hard
15.	Annadata Shetkari Farmer Producer company Ltd	Wardha	Deoli	Sonegaon	Pulse Mill (Dal Mill)	Activity has observed in working condition.	Link BADE The HILDRA Reserved The HILDRA Reser	


16.	Rajchandra Farmer Producer company	Washim	Manora	sakhardoh	Establishment of Custom Hiring Centre	Activity has observed in working condition.	
17.	Sai Gajanan Risod Farmer Producer company Ltd	Washim	Risod	Chikhali	Establishment of Custom Hiring Centre	Activity has observed in working condition.	
18.	PKM Farmer Producer company Ltd	Washim	Risod	Wadi Raytal	Establishment of Custom Hiring Centre	Activity has observed in working condition.	

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19.	Painganga Marketing And Farmer Producer company	Washim	Malegaon	Ekamba	Establishment of Custom Hiring Centre	Activity has observed in working condition.	
20.	Krushidhan Agro Producer company Ltd	Yavatmal	Umarkhed	KopraBk	Other Agribusiness Activity - Auction Shed	Activity has observed in working condition.	
21.	Bhai Namdevrao Farmer Producer Company Limited	Yavatmal	Wani	Wani	Establishment of Custom Hiring Centre	Activity has observed in working condition.	

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