Concurrent Monitoring – Round VI Report

Monitoring and Evaluation for Project on Climate Resilient Agriculture (PoCRA) In Marathwada Region, Maharashtra

Nanaji Deshmukh Krishi Sanjivani Prakalp

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

Submitted by

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Abbreviations

AA	Agriculture Assistant
BBF	Broad Bed Furrow
CA	Cluster Assistant
COVID-19	Corona Virus Disease 2019
CBP	Capacity Building Program
CFP	Community farm pond
CRAT	Climate Resilient Agriculture Technology
DBT	Direct Benefit Transfer
DSAO	District Superintending Agriculture officer
FFS	Farmer Field School
FPO	Farmers Producers Organisation
FPC	Farmers Producers Company
GF	Guest Farmer
HF	Host Farmer
IDI	In-Depth Interview
M&E	Monitoring and evaluation
MIS	Management Information System
NRM	Natural Resource Management
PDO	Project Development Objective
PoCRA	Project on Climate Resilient Agriculture
PS	Project Specialist
SDAO	Sub-Division Agriculture Officer
SHG	Self Help Groups
TAO	Taluka Agriculture Officer
VCRMC	Village Climate Resilient Agriculture Management Committee

Executive Summary

Introduction

The Project on Climate Resilient Agriculture (PoCRA) is being implemented by Maharashtra government in collaboration with the World Bank to enhance climate resilience and profitability of smallholder farming systems in selected districts of Maharashtra. PoCRA is based on a multi-pronged and comprehensive approach which aims to build climate resilience in agriculture through scaling up tested technologies and practices.

Sambodhi, in partnership with TERI, has been recruited to conduct M&E of PoCRA in all eight districts of Marathwada region. As part of its mandate on the monitoring and evaluation of the project, one of the key components is to conduct concurrent monitoring of the project, which is being conducted bi-annually for six years. Concurrent monitoring aims at finding out bottlenecks in the implementation of each project component and suggesting solutions for the same. It also aims to get beneficiaries' feedback on the key processes of the different project components. Further, concurrent monitoring also aims to assess the progress of the project on key indicators as per the results framework, which are measurable through concurrent monitoring rounds. The first concurrent monitoring was conducted from the start of the project till 31st March 2019. With a plan to conduct a total 12 rounds of concurrent monitoring in every six months, the current round, i.e., the sixth round of concurrent monitoring, has considered the period from 1st April 2021 to 30th September 2021.

Methodology

Like previous rounds of concurrent monitoring, the current concurrent monitoring-VI (CM-VI) focused on the concurrent process and progress monitoring which includes different components such as individual matching grants accessed using Direct Beneficiary Transfer (DBT) application, farmer field school for demonstration of climate-resilient and sustainable farming practices, construction of community assets which are aimed to benefit the farming community of the area including natural resource management works and community farm pond, farmer producer organizations and self-help groups for strengthening post-harvest and value chain strengthening agri-business activities. Feedback on the functioning of Village Climate Resilience Management Committee (VCRMC), Krushi Tai, satisfaction in project planning, micro-planning, support from project staff, support received and expected by the FPOs/FPCs etc., were also analyzed in the project and control villages. The project MIS data for the period was also analyzed to understand the progress of the project activities during this period. The study area is comprised of eight districts of Marathwada region of Maharashtra viz. Aurangabad, Beed, Nanded, Hingoli, Latur, Osmanabad, Parbhani and Jalna.

A mixed-method approach has been adopted for all the concurrent monitoring surveys of PoCRA conducted till date. The CM-VI of PoCRA project followed similar methodology as used in previous rounds of concurrent monitoring. A quantitative survey tool for the beneficiaries and qualitative interview schedules for the other key project stakeholders were finalized in discussion with PoCRA PMU team. Concurrent monitoring round VI survey was conducted in 30 project and 15 comparison villages. A sample of 675 beneficiary respondents were targeted to cover under the quantitative survey, which includes 450 respondents in project and 225 respondents in comparison areas. As per the methodology of CM-VI, it was ensured that project to comparison respondent ratio remains 2:1. Also under qualitative survey, a total of 170 samples (37 FGDs and 133 indepth interviews) covering various key stakeholders of PoCRA project were conducted. The quantitative estimates at the aggregate level in the report provides broad indication, but the estimate may not provide statistical precision as the sampling is not entirely random and for some categories, the sample size is not adequate. Therefore a mix of quantitative estimates and qualitative insights have been used to draw conclusions from monitoring of project point of view.

Summary of Key Findings in Concurrent Monitoring Round VI

Cultivation Practices

In the project cluster, in Kharif season, nearly 95% of the total respondents cultivated their land with an average of 5.5 acres per household. Similarly, 88% of total respondents cultivated Rabi crops (on an average of 4.4 acres per household), and 10% respondents cultivated summer crop (on an average of 5.3 acres per household) in the last 12 months. The same is true for comparison clusters. Around 99% of respondents cultivated Kharif crop (on an average of 4.6 acres per household), 88% of respondents cultivated Rabi crop (on an average of 3.7 acres per household), and 9% farmers cultivated summer crop (on an average of 2.4 acres per household). There has been marginal improvement of total cultivated area in Rabi and summer crops in project areas compared with CM-V as CM-VI findings reflected 84% in Rabi crops and 7% in summer crops cultivated in the land. Around 14% respondents in project clusters and 11% respondents in comparison clusters had land (on average of 8 and 6.3 acres per household respectively) under orchards plantation. Nearly

94% respondents in project clusters had irrigation source, while in comparison 91% had irrigation facility. Comparing irrigation facility in CM-VI with CM-V round, no change has been observed.

It was observed that nearly 88% of respondents in both project and comparison clusters faced crop damage and the percentage of crop damage has increased in comparison to CM-V. In CM-VI nearly 64% of respondents in project clusters and 60% of respondents in comparison clusters faced crop damage. The primary reason for crop damage in both project and comparison clusters is excessive rain, dry spell, and hailstorm. Nearly 11% of respondents in both project and comparison clusters faced crop damage due to pest and disease attacks. Most of the damage in Kharif crops in both clusters is experienced during the harvesting stage. Most of the respondents also shared that damage also occurs in Kharif crops at the pod development and flowering stage.

The area under cultivation using climate-resilient certified seed varieties for chickpea was 63% in project and 56% in comparison areas. The land under certified seeds for soyabean was higher in comparison area (86%) as compared to project areas (76%). Same was the case for pigeon pea, wherein it was observed that the comparison sample had a higher percentage of the land (41%) under certified seeds as compared to the project (37%). However, the overall percent of land under certified seeds for these three crops in both the project and comparison areas is almost same (66%).

Awareness about PoCRA

The most important source of information about PoCRA in project clusters were Gram Panchayat Members (79%) and project staff (52%) (Agriculture Assistant, Cluster Assistant, FFS Facilitator, Project Specialist, Krushi Tai, etc.). In the case of comparison villages, information was mostly gained from Gram Panchayat members (60%), through friends and relatives (42%), and through project staff (29%). Other sources include village microplanning activity, advertisements on radio/television, hoardings, and project display boards.

it was observed that 97% (with an increase of 1% since CM IV and 12% since CM II rounds) respondents in project clusters were aware of matching grants for irrigation systems like drip and sprinkler, etc. used for protected cultivation. Nearly 80% of respondents (with an increase of 1% since CM V, 2% since CM IV and 20% since CM II) were aware of support received for construction of farm pond with inlet and outlet, and 72% respondents knew about matching grants received for doing protected cultivation by the construction of shade net, polyhouse, and polytunnel. As compared to individual benefits, it was observed that there was little awareness about NRM works conducted under the project. Also, respondents were less aware of the matching grant support to FPCs and SHGs to start an agribusiness activity. More awareness should be created for these activities for which the awareness level is less. Regarding the awareness of the steps that are involved in accessing the individual level benefits as part of the PoCRA project, respondents were found to be aware of initial steps such as registration on the DBT portal (91%). The other individual benefits found were application for matching grant on the DBT portal (78%), verification of application by cluster assistant (73%), and approval by VCRMC committee (62%).

Adoption and training of CRAT and agrometeorological advisory

Around 90% of respondents in project clusters showed willingness to adopt the climate-resilient agricultural technologies (CRATs). It is observed that 45% of respondents in project clusters, as compared to 35% in comparison clusters, showed interest in following the agrometeorological advisory regularly. Nearly 79**%** of respondents in comparison clusters did not have soil health cards as compared to 59% of respondents in project clusters. It was observed that more respondents in project clusters (39%) as compared to those in comparison (20%) treated the soil using soil health card information. About one third of respondents from both clusters reported that they did not have the technical knowledge to use the soil health information. Responding to the question if the respondents would like to get a mobile app for agriculture and allied activity related information or advisory services, the majority of respondents both in the project (83%) and comparison (81%) clusters responded positively. Majority of respondents across all districts and social categories seek advisory in the mobile app on key aspects of climate-resilient technology, weather and soil nutrient. However, attention should also be given to those advisories on which the respondents recorded low demand like market for agriculture produce, agri-business, poultry/goatry/fishery, and environmental safeguards. During qualitative discussions, these aspects having low demand are also of priority areas for the farmers, but here the demand is low maybe because of lack of information regarding how mobile app would help them for these activities. To increase their interest for these activities, training and awareness creation can be prioritized.

Almost all the beneficiaries covered in the project clusters have received at least one training. However, large-scale variation was observed in the proportion of farmers receiving different types of training. More percentage of respondents were found to be trained in the project through FFS and other sources.

Individual project benefits

Out of 71% of respondents in project clusters, nearly 67% had applied or received individual benefits, 31% had participated in farmer field school, and 2% had accessed both the benefits. Around 96% of respondents in comparison clusters had applied or received individual benefits. It is observed that the highest demand under the project was for sprinklers (30%), followed by drip (27%), pipes (10%), and pumps (7%).

Individual matching grants: Regarding the status of application for individual benefits in project clusters, nearly 62% of respondents had received the matching grant on their bank account. It was observed that the transfer of matching grants in current round VI has improved by 2% as compared to that observed during the CM V round. All beneficiaries were found to be aware of their application status, which is a positive trend.

Irrigation facility: More than four-fifth of each type of beneficiaries of four individual types of irrigation benefits (drip, sprinkler, pipes, and pumps) reported an increase of income and increase of agricultural production as the major benefits of adopting these. An increase in income was reported more among the beneficiaries of drip and sprinkler irrigation than beneficiaries of pipes and pumps. Other major benefits reported were increased availability of water, increase in the area of cultivation in both Kharif and Rabi season, change in cropping season, and availability of water in dry spells.

Drip irrigation system: Of 58 beneficiaries who have applied for project grant for drip irrigation system, 36 have set it up. 28 of them (78%) use their irrigation set only when required. Six beneficiaries use the set regularly, while the remaining two use the set seasonally. Most of the farmers used drip irrigation to irrigate cotton (25%), soyabean (42%), chickpea (33%), and sugarcane (17%).

Sprinkler irrigation system: A total of 66 beneficiaries who had accessed the sprinkler irrigation system under the project were surveyed. 42 of them have implemented it on their fields. Except for six, all of them used sprinkler sets only on the requirement. The area irrigated using sprinkler irrigation lay between 1 to 19 acres, and on an average, it is around 4 acres per household undertaking sprinkler irrigation. Common crops that are irrigated using sprinkler irrigation include soybean (57%), chickpea (81%), sorghum (12%), wheat (14%), cotton (12%) and pigeon pea (12%).

Pipes and pumps: 21 beneficiaries who have accessed the benefit of pipes from PoCRA were surveyed. 13 of them have received the benefit. Most of them (10 of 13 beneficiaries) were found to be using them as per the requirement. Of the 15 beneficiaries who have accessed water pumps as a project benefit and were surveyed, 10 of them used water pumps only on requirement.

Shade net: Out of the eight shade net beneficiaries who were surveyed, four beneficiaries have received training on how to do cultivation in shade net. All the four shade net beneficiaries are primarily growing vegetables in their shade net, and one of them was also involved in horticulture activity. All four got the technical guidance on how to cultivate to achieve better productivity with the help of an agriculture assistant. Three of them were were using it regularly, and one had reported that he used it seasonally.

Horticulture plantation: Of the total 26 beneficiaries who have access to the benefit, 18 have received the support and implemented it. Out of 18 project beneficiaries of the horticulture plantation, one-third were found to have received training. The source of training was department of agriculture (five beneficiaries), and one received it from progressive farmers. The main crops grown by beneficiaries were custard apple (17%), guava (50%), sweet lime (17%), and mango (17%).

Individual farm pond: 16 beneficiaries who accessed the benefit of an individual farm pond were interviewed. Seven of them have received and implemented the benefit. Two farm ponds have inlet and outlet but no grass cultivation on its bund. According to half of the respondents, once the farm pond is filled with water, it lasts for around 90 days. All the respondents use the water as per requirement. Currently, none of the beneficiaries are using the farm pond for inland fishery activity. Except for two, the beneficiaries did not face any difficulty in accessing the benefit from PoCRA.

Feedback on BBF Technology: Out of 71 respondents using BBF technology, 87% of respondents found it to be useful during excessive rain last year. The respondents noted that it helped in the drainage of excess water and helped in root development by avoiding water stagnation. Of the total FFS participants, including host and guest farmers, 66% found that the technologies learned through farmer field school demonstration sessions have been very helpful in reducing the impact of climate vulnerability (less rainfall, high temperature). The remaining 34% found the technologies to be helpful to some extent. All the participants reported that the information provided by the FFS facilitator was useful. Nearly 94% of the FFS participants, including host and guest farmers, are willing to continue using the technologies.

Status of individual benefits and suggestions: Of the total 236 beneficiaries of individual activities interviewed, around 58% of beneficiaries have constructed assets at the site. Rest have either not started the activity due to financial issues or they are under construction. Almost all beneficiaries (99%) had a good experience with the application process.

Farmer Field Schools (FFS)

Farmer Field School (FFS) is an important component being implemented under PoCRA. The two key stakeholders in FFS are the host farmers and guest farmers. Host farmers are the ones who host the farmer field school on their agricultural land. Guest farmers are the one who attends the FFS sessions to learn through demonstrations of new climate resilient agriculture technologies promoted under PoCRA. On asking if they have attended all technology sessions conducted under PoCRA FFS, 74% of FFS farmers responded positively. Rest 18% FFS farmers could attend 3 to 4 FFS sessions on an average. Nearly 79% of the participant find the timing of the FFS session convenient. 70% of all the sample guest farmers have reported that their queries were satisfactorily answered by FFS host farmers. 43% of all FFS participants, including host and guest farmers, have requested training on topics apart from what is covered under FFS. Some of the key topics on which they expect training are orchard plantation, goatry, certified seeds, and the marketing of agricultural produce. 92% (97 of 106) of all FFS participants including host and guest farmers think that they have benefitted from attending the FFS session.

Community Works – NRM and Community Farm Ponds

When asked whether the planning for the development of community assets is done according to the water balance, nearly three-fourth of the respondents in control and 94% in project clusters said yes, around 2% in project and 16% in comparison responded no, and nearly 4% from project and 12% from control clusters were not aware of the development planning. 80% of the respondents in project villages and 64% in the comparison villages shared that social audit has been done in their village. When asked if they have experienced an increase in groundwater level near their farm after construction of these NRM assets, 86% (43 of 50 respondents) in project clusters and 88% (22 of 25 respondents) in comparison clusters responded positively. The rest are hopeful that it may increase in future. When the respondents in the project clusters were asked about their willingness to be involved or their involvement in the maintenance of these assets post construction, 94% (47 of 50 respondents) responded positively. The beneficiary sample for community farm ponds includes 18 beneficiaries from the project area. In project villages, it is observed that generally 3 to 10 members come together to apply for CFPs. In 94% of the project cases, the asset was found on site. None of the farm ponds had an inlet-outlet, but they had linings.

PoCRA supported FPOs and SHGs

A total of 16 project supported FPCs were covered, and feedback from a total of 46 FPC respondents (21 FPC directors and 25 members) was taken as part of the CM VI round. Almost all respondents shared that their FPC has both male and female members, and agreed that their FPC is operational. During the survey, 72% of 25 members shared that they always participate in general body meetings of their FPCs, 5% sometimes attend it, and the rest 2%, rarely attend the meeting. Nearly the same proportion of members participate in the decision-making process of their FPCs. Around 48% of 25 members reported that they get priority for accessing storage facility of their FPC, for 12% of them the priority is not applicable, and the remaining 40% shared that they do not get priority access. Nearly 35% of all 46 FPC respondents, including directors and members, have received training on especially custom hiring centres, farm mechanization, seed production, and crop management. A total of 8 SHGs were covered, and feedback from a total of 18 SHG respondents (9 SHG presidents and 9 members) was taken as part of the CM VI round. Nearly 44% of all 18 SHG respondents, including president and members, have received training on especially custom hiring centres, farm mechanization, seed production, and crop management. Also, 75% of the respondents have also received training on business establishment through the agriculture department. 83% (15 of 18) of respondents shared that they save regularly on a monthly basis, while the rest reported that they are not currently saving regularly. The average monthly saving is approximately Rs. 450. 50% of respondents noted that their SHGs are involved in income-generating agribusiness activities such as custom hiring centres.

Access to other government schemes

Major schemes from which beneficiaries are drawn from both project and comparison clusters are particularly related to agriculture credit and insurance. Pradhan Mantri Fasal Bima Yojna (88% in project and 80% in comparison) followed by Kisan Samman Yojana (29% in project and 28% in comparison) were the most popular among all government schemes.

Satisfaction on other project parameters

75% (124 of 164) of respondents in project clusters were aware of the village level micro-planning (as part of PoCRA project) that was conducted in their village to decide what watershed management activities should be done in their village. 81% (101 of 124) of them had participated in the development of your village's micro-plans developed as part of PoCRA project. 46% (46 of 101) of the respondents in the project village found the water budgeting application used in the micro-planning process useful, 50% (50 of 101) of the respondents found it very useful, and the rest did not find it useful. 73% (124 of 164) respondents in project villages feel that VCRMC represents all sections of the society, 12% (20 of 164) say it is not representative, and the remaining 12% do not have a say.

Key Challenges and Actions

Along with process and progress monitoring, one of the key objectives of concurrent monitoring is to identify the current challenges in project implementation, provide suggestions and highlight the action taken by the project stakeholders to address the same. Some of the key challenges, suggestions, and actions taken are presented as follows.

Before giving individual matching grant to Drip, Sprinkler and other activities, project staff must verify the beneficiary farmers' details from the data available at various desks. It is suggested that a single window be made available for getting relevant data related to applicant farmer to save time of project staff and improve efficiency. It is observed that some farmers apply for project benefits based on their non-cultivable land (PotkhaRabi Land). For convincing these farmers about their non-eligibility, VCRMC must be trained to scrutinize their applications in detail before processing it for pre-sanction and reject it. It is observed that large number of pending presanctions for the individual works are present at the SDAO level as the desk below SDAO cannot reject the application during the spot verification. The right to reject the application may be given to the officer who does the technical field visit and check if the work at site is found not suitable or activity not complying with the guideline. Higher level officials may monitor these actions.

Some of the activities as part of the project were reported to be closed (like pipes, motor, open dug well, community farm pond, goat rearing) though there is still demand amongst the farmers for these benefits. It is suggested that the project should reassess if any of the closed activities can be resumed and if feasible, decision for resuming can be decentralized. As informed by PMU, open dug well activity has been resumed due to high demand and the beneficiaries are applying for this activity. However, the demand for the e-class farm pond in the project area has been low because of challenges in its maintenance post construction. This may be overcome through awareness and meeting with follow ups with the GP members and finding middle way by avoiding conflicts. Workload on project staff is a persistent challenge, which results in a delay in approvals of the grant application. The number of villages under CAs/AAs with high number of villages should be reduced. Also, the capacity of Krushi Tais can be built to assist AAs and CAs in processing applications of the farmers. As of March 2021, 1738 Krushi Tais are trained. Further, IT infrastructure has been improved at the block level. In first batch, 52 TAOs were provided with laptop. In second batch, the remaining 103 TAOs were provided with laptops. In addition to this, 15 SAO were provided tablets. It is suggested to hire a vehicle whenever field visits are to be conducted and claim the reimbursement for the same. Regarding community NRM works, they are still not being implemented at large scale. NRM works were observed in only three sample PoCRA villages. More efforts need to be put in by the project to expedite the implementation of community works. Workshop with key stakeholders should be conducted to identity the key impediments and practical solutions and realistic times should be set for their implementation. As shared by the PMU, the NRM portal is now live, and PS Agriculture are being trained at the WALMI and RAMETI for undertaking NRM works. Also, exposure visits are being conducted in the villages to make the farmers aware of importance of NRM works.

The MOU has been signed by PoCRA with the Bank of Maharashtra and State Bank of India to ease difficulty faced by the FPOs in availing bank loans. Also, the CA and the dedicated Project Specialists for Agribusiness provides the guidelines for developing business proposals to the FPC representatives. With these efforts, for construction godown or small warehouse, a total of around Rs. 75 lakhs are disbursed among 7 farmer groups in Aurangabad district, around Rs. 36 lakhs among 3 farmer groups in Hingoli, and Rs. 148 lakhs among 11 farmer groups (including 3 SHGs and 5 FPCs) in Jalna are disbursed. The training to the FPC directors related to Godown are being conducted at Vamnicom as well as the machine operators training are also organized for the skill improvement related to tractor mounted BBF machine. One CHC is expected to serve minimum of 300 Ha of area. Based on the area of villages, optimal number of CHCs should be established. Government approved machineries can be procured for CHCs.

1. About the Study

1.1. Project Background

Agriculture is vulnerable to climate change. The negative impacts of climate change are already being felt in the form of increasing temperatures, weather variability, shifting agroecosystem boundaries, invasive crops and pests, and more frequent extreme weather events. On farms, climate change is altering crop yields, affecting nutritional quality of major crops, and lowering livestock productivity[1]. The recent report of Asian Development Outlook, 2021 published by Asian Development Bank in September 2021 highlighted the importance of transformation of agriculture in the developmental process. Agriculture is exposed to risks from a changing climate and from farm practices that are not environmentally sustainable[2].

More than half of the population of Maharashtra is dependent on agriculture for livelihood. About 22.6 million hectares of land in Maharashtra is under cultivation (gross cropped area) [3]. About 84% of the total area under agriculture in the state is rainfed and is dependent only on the monsoon[4]. About 49% of the landholdings in the State falls in the marginal category, with less than one hectare of land. Smaller land holdings and heavy dependence on monsoon for irrigation make agriculture vulnerable to climate change impacts. In addition to climate vulneRabilities, farmers face high production and market risks. High production costs, low productivity and water scarcities at the production end, and unreliable price of produce due to limited market reach are common challenges faced by farmers across the state. [5]

In response to the above-mentioned challenges, the Government of Maharashtra, in partnership with the World Bank, conceptualized the Project on Climate Resilient Agriculture (PoCRA) for 5,142 villages in 15 districts of Maharashtra[6]. The Project Development Objective (PDO) of PoCRA is *to enhance climate resilience and profitability of smallholder farming systems in selected districts of Maharashtra*[7]. PoCRA is a first of its kind climate-resilient project undertaken in the agriculture sector. This is envisaged to be achieved by promoting climate-resilient agriculture systems, post-harvest management, value chain promotion, and institutional development[8].

The project is built around a comprehensive, multi-sector approach that focuses specifically on building climate resilience in agriculture through scaling up tested technologies and practices. This project attempts to bring transformational changes in the agriculture sector by scaling up climate-smart technologies and practices at the farm and (micro) watershed levels.

The overall project vision is to contribute towards three critical impact areas: a) Water Security, b) Soil Health, c) Farm Productivity & Crop Diversification. The need for intervention across these three areas in the region is evident from the agro-climatic attributes of the area. The project aims to contribute to drought-proofing and management of lands in states' most drought and salinity/sodicity-affected villages.

The project has been implemented in 15 districts in Maharashtra, which include eight districts of the Marathwada region (Aurangabad, Nanded, Latur, Parbhani, Jalna, Beed, Hingoli, Osmanabad), six districts of the Vidarbha region (Akola, Amravati, Buldana, Yavatmal, Washim, Wardha), Jalgaon district of Nashik Division and approximately 932 salinity affected villages in the basin of Purna river spread across Akola, Amaravati, Buldana and Jalgaon districts[9]. Figure 1 highlights the villages where the project is being implemented. This project will be implemented in six years from 2018-2024[10]. Out of the 15 districts where PoCRA is implemented, the current assignment is conducted in eight districts of the Marathwada region, covering 347 mini watershed clusters. The project is being implemented in a phased manner reaching out to 70 clusters in year I, 175 clusters in year II, and 102 clusters in year III.

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[1] https://www.worldbank.org/en/topic/climate-smart-agriculture

[2] Asian development outlook, 2021, Asian Development Bank, September 2021

[3] Source: PoCRA Project Implementation Plan (PIP) document

[4] Source: ibid

[5] Source: PoCRA Project Appraisal document

[6] Source: ibid

[7] Source: PoCRA Project Appraisal document

[8] Project implementation status report as on 31st March, 2021, Maharashtra PoCRA

[9] Source: PoCRA- Sambodhi Terms of Reference

[10] Source: ibid

Climate change and climate variability in MH

Climate-resilient agriculture POCRA

Development outcomes and overarching goals

Increase in average temperature

Increase in avg. monsoon rainfall BUT

High rainfall variability across space and time

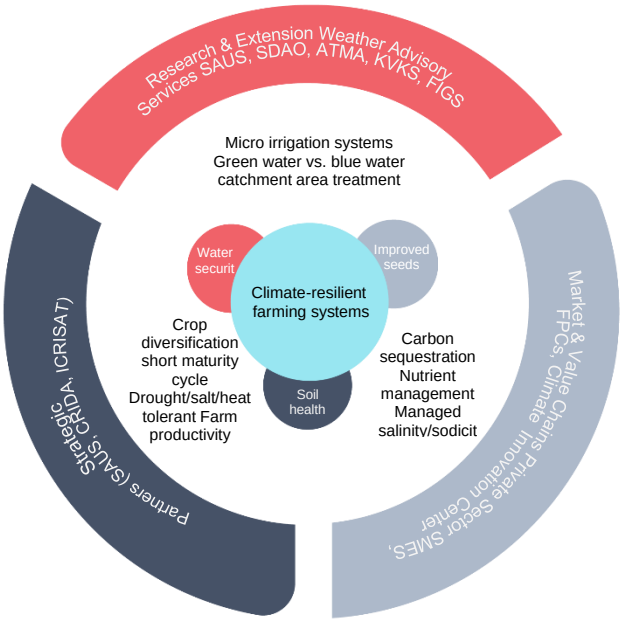
Higher rainfall intensity

Delays in onset of monsoon rainfall

More frequent extreme precipitation events and floods

Partners

Prolonged dry spells withing monsoon period



A more climate-resilient agriculture sector

Enhanced agricultural productivity

Household food and income security

Agricultural sector growth

GHG emission reduction and climate co-benefits

Contribution to India's Intended

Nationality Determined Contribution (COP21)

Contribution to the WBG's commitment to increase the climate-related share of its portfolio(CCAP)

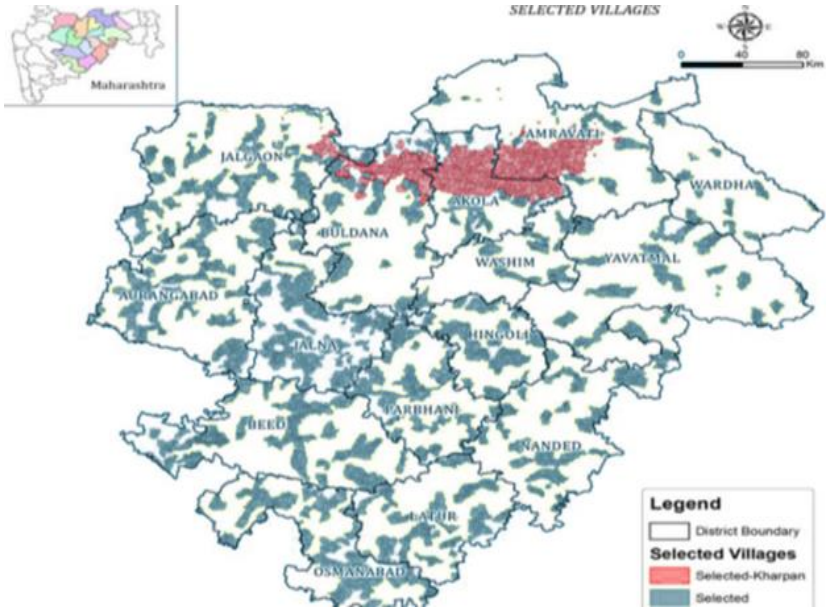


Figure 1.2 Nanaji Deshmukh Krushi Sanjivani Prakalp (PoCRA) project area and villages

1.2. Overview of the Study Area

About 40% of the Maharashtra State falls under Drought Prone Area, with less than 750 mm of the annual average rainfall[11]. In Maharashtra, the Marathwada region specifically has been floundering under drought conditions since 2012, with the highest rainfall deficit in the country at 48% in 2014. The Marathwada region consists of 8 districts: Aurangabad, Beed, Latur, Osmanabad, Parbhani, Jalna, Nanded, and Hingoli.

The region has a population of about 1.87 crores and a geographical area of 64.5 thousand sq. km[12]. Agriculture is the major source of income generation for over 64% of the state's population. However, given harsh weather conditions, the region's agricultural system has been depleting significantly. Jowar, Bajra, along with other Kharif crops, were completely wiped out in 2012 when the monsoon failed (Kumar, Mail Online India, 2013). Jalna, famous for being the biggest producer of sweet lime, had been the worst hit in the drought. The anticipated impact of climatic change as well as climate variability presumably led to increased pressure on already scarce water resources.

Starting in 2014, the Jalyukt Shivar Abhiyaan[13], one of the state government schemes, started its intervention to make the state drought-proof by 2019. It aimed to make 5,000 villages free of water scarcity every year through deepening and widening of streams, construction of cement and earthen stop dams, work on nullahs and digging of farm ponds. A total of 158,089 water management works were to be carried out under this project, of which 51,660 have been completed till April 2018. This demonstrates that there is a need for more concentrated efforts for mitigation and adaptation to reduce the vulnerability of agriculture and make it more resilient.

Within this context, there is an urgent need for farmers to enhance their resilience to the threats of climate variability. The fact is that most of the farmers in the project region are small and marginal[14], their adaptive capacity is very limited; hence economically viable and culturally acceptable adaptation techniques need to be developed and implemented. The Government of Maharashtra has realized the implications of building climate resilience in the agricultural sector and has developed a drought-proofing and climate-resilient strategy as a long-term and sustainable measure to address the likely impacts of climate change. With this backdrop, the Project on Climate Resilient Agriculture (PoCRA) has been formulated by the Government of Maharashtra with support from the World Bank. This is the first large-scale climate-resilient agriculture project in India that aims to enhance climate resilience in agricultural production systems through a series of activities at the farm level.

2. Objectives of Concurrent Monitoring of PoCRA

Along with evaluating the impact of PoCRA, the other key objective of the assignment is to conduct concurrent progress monitoring of PoCRA for its implementation in the Marathwada Region. The objective of concurrent monitoring is:

- To assess the progress of the project on key performance parameters.
- To find out which are the key components of the intervention that are effective, what are the process bottlenecks in the implementation of the project, and to get feedback from the key stakeholders on the implementation so that it can be improved during the project implementation.
- To validate the veracity of the MIS data by validating the information in the MIS progress reports.

[11] Hydrology and Water Resources Information System for India, National Institute of Hydrology, Roorkee http://nihroorkee.gov.in/rbis/India_Information/draught.htm

[12] Census 2011, http://shodhganga.inflibnet.ac.in/bitstream/10603/152935/11/11_chapter%204.pdf

[13] Government of Maharashtra had launched a water conservation scheme named Jalyukt Shivar Abhiyan in 2016 to make Maharashtra a drought-free state by 2019. The programme aimed to make 5000 villages free of water scarcity every year. The key aim of Jalyukta Shivar Abhiyan was to establish belief in a farmer that "every drop of rainwater is owned by me and it should percolate in my land".

[14] 'Marginal Farmer' means a farmer cultivating (as owner or tenant or share cropper) agricultural land up to 1 hectare (2.5 acres). 'Small Farmer' means a farmer cultivating (as owner or tenant or share cropper) agricultural land of more than 1 hectare and up to 2 hectares (5 acres)

3. Overarching Monitoring Framework

The framework in figure 3 below presents the overarching approach that has been adopted for the concurrent monitoring of PoCRA:

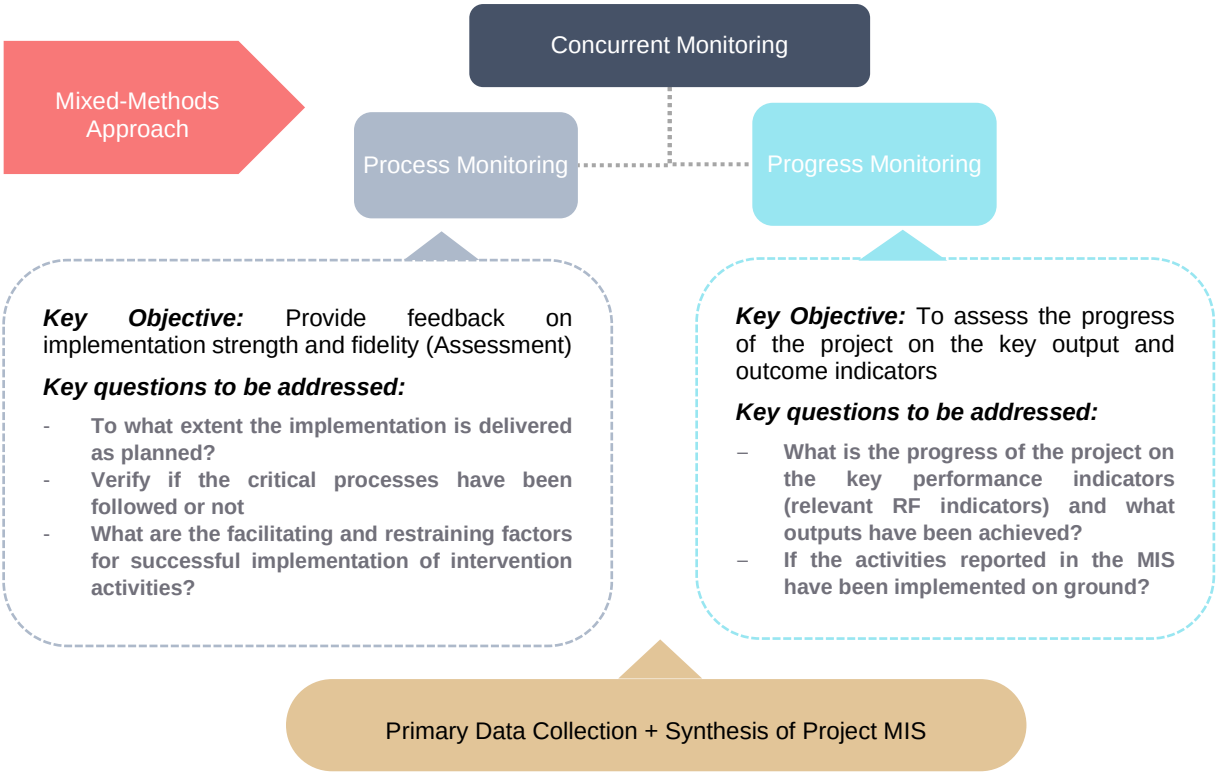


Figure 3.1 Overarching methodology

Building the premise for concurrent monitoring: The project development objectives along with the list of activities planned to be conducted within the project areas are specified in the ToR. The project activities are carried out in three phases across districts and clusters. The sample for each concurrent monitoring is selected in line with the sampling methodology proposed in the ToR. It is envisaged that the processes that are being implemented and would need to be monitored should be listed. A detailed discussion with the PMU team, relevant stakeholders, and a secondary literature review of relevant documents was done to understand these key processes. Also, during the listing of processes, Sambodhi studied the ongoing schemes or projects of similar nature in the comparison areas so that a premise for assessment could be built. The overall objective of the bi-annual concurrent monitoring reports is to provide feedback to the PMU on the status of project implementation and provide recommendations for course correction.

4. Methodology

The methodological approach for conducting concurrent monitoring has the following steps illustrated in figure 4.1.

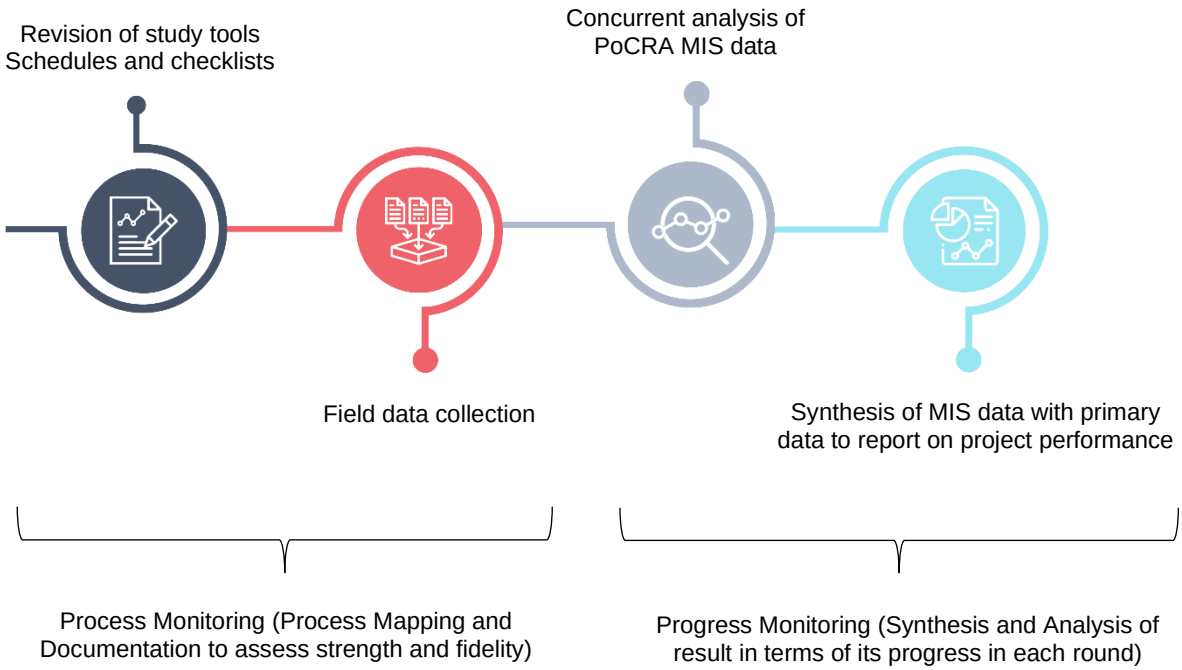


Figure 4.1 Concurrent monitoring methodology steps

Step 1: Revision of study tools – Schedules and checklists: Based on the list of processes to be monitored, learnings/experiences from previous CM rounds and the updates in the program, the study tools, i.e., schedules, and checklists were revised in Round VI. The revised tools were shared with PMU and key experts for feedback. One-to-one key expert meetings were held to discuss the revisions in tools and expectations from expert field visits anticipated in the CM VI round. The study tools were finalized post incorporation of comments/suggestions from PMU as well as key experts.

Step 2: Primary data collection from field

The primary data has been collected based on revised study tools which are categorized as shown in table 1 below.

Table 4.1 Category of study tools

Structured Interview Schedule	An interview schedule was developed for the respondent survey and included questions relating to the access to intervention, processes, respondent's participation, perception, and feedback on activities. As part of the beneficiary survey, physical observation of the in-progress and completed activities have been done.
Key-informant Interview Schedule	Since the project activities are being carried out at various levels, including individuals, community (village and cluster) as well as district level, key informant interviews have been conducted with key stakeholders (viz. Agriculture Assistant, Agriculture Supervisor, Cluster Assistant, DSAO, SDAO, TAO, FFS Coordinator & Facilitator, Krushi Tai, and FPC representatives) involved in the implementation of the project to get their feedback

	on project implementation and further improvement of the program.
Focus Group discussion schedule	Focus group discussions have been done with Village Climate Resilience Management Committee (VCRMC) members and Project specialists of districts to investigate the current status of implementation of the project and get feedback on project implementation and further improvement of the program.

In addition to the structured surveys, interviews, and focus group discussions with key stakeholders, field visits by experts are also conducted as part of concurrent monitoring. The objective of the expert field visit is to provide insights pertaining to the ground realities of the situation in agriculture as well as project implementation and accordingly highlight the key challenges as well as suggest/recommend solutions for project improvement.

Step 3: Concurrent analysis of PoCRA MIS data

For monitoring the progress of the project, the MIS data of activities and outputs have been analyzed to see if the project implementation is progressing according to the plan. The project performance is assessed on the key performance indicators, including the results framework indicators, which need to be assessed on a semi-annual or annual basis. A consultative approach is adopted to resolve queries related to indicators on which data is required from the PMU MIS team and other relevant stakeholders. Project activities and geography-wise analysis has been done to identify the strengths and weaknesses in the project implementation.

Step 4: Synthesis of MIS data with primary data to report on project performance

The MIS data on the project progress, the primary data on the quality and feedback of implementation (from stakeholder interviews and beneficiary interviews) is synthesized to report on the status of implementation of the project for the period of concurrent monitoring round. The current concurrent monitoring report highlights the activities/processes for which the implementation quality needs to be improved. It also aims to identify the challenges or bottlenecks in implementation.

The quantitative estimates of the CM-VI report at the aggregate level for some indicators provides broad indication of status of those indicators. However the estimation may not provide statistical precision at the aggregate level (e.g. project and comparison areawise or district wise or category wise) as the sample selection is not strictly random and also for some categories, sample size is not adequate. The estimates of any indicator should not be compared with the estimates of that indicator available from the secondary sources. Therefore a mix of quantitative estimates and qualitative insights have been used to draw conclusions from monitoring of project point of view,not from a typical point of view of evaluation of the project.

4.1. Sampling Methodology

The sampling size and methodology adopted for the current concurrent monitoring round have been explained in this section. The sampling methodology remains the same as which was adopted during the previous rounds of concurrent monitoring. Using the proposed sampling method in line with the ToR, concurrent monitoring has been conducted in both project and comparison areas. The ratio for the project to comparison remains at 2:1 (as given in the ToR). The concurrent monitoring exercise intends to cover all 347 clusters across eight districts over the period of six years. Twelve concurrent monitoring rounds would be conducted over six years, i.e., two in a year. Given the phased approach to implementation, the project will be implemented in 70 clusters in the year I, 175 clusters in year II, and 102 clusters in year III. The sampling strategy for concurrent monitoring is proposed likewise. The number of clusters to be visited in each district in each round has been selected proportionately. The distribution of the beneficiary samples across districts and monitoring rounds is presented in table 2 below. Accordingly, a total of 30 project clusters and 15 comparison clusters have been covered in Concurrent monitoring Round VI. The list of sampled clusters and villages has been provided in Annexure A.

Table 4.2 sample Distribution

Sl. No	Districts	Round wise clusters to be covered												Total
		1	2	**3**	4	**5**	6	7	8	9	10	11	12	
1	Aurangabad	3	5	5	5	5	5	5	5	5	5	5	5	58
2	Bid	3	4	3	3	3	3	3	3	3	3	3	3	37
3	Jalna	2	2	5	5	5	5	5	5	5	5	5	5	54
4	Latur	3	3	4	4	4	4	4	4	3	3	3	3	42
5	Osmanabad	3	5	5	5	5	5	5	5	5	5	5	5	58
6	Nanded	2	2	3	3	3	3	3	3	3	3	3	3	34
7	Parbhani	2	3	3	3	3	3	3	3	4	4	4	4	39
8	Hingoli	2	3	2	2	2	2	2	2	2	2	2	2	25
Total Project clusters		20	27	30	30	30	30	30	30	30	30	30	30	347
Total Comparison clusters		10	14	15	15	15	15	15	15	15	15	15	15	174
Total Project sample		300	405	450	450	450	450	450	450	450	450	450	450	5205
Total comparison sample		150	210	225	225	225	225	225	225	225	225	225	225	2610
Total beneficiary sample per round		450	615	675	675	675	675	675	675	675	675	675	675	7815

The steps in sampling methodology that have been adopted for concurrent monitoring round VI have been detailed below:

Selection of Project Clusters

30 clusters were sampled for concurrent monitoring round VI in project areas. These 30 clusters were sampled proportionately from the eight project districts, as presented above in the beneficiary sample distribution table 2. The clusters required to be sampled from each district were sampled randomly from the total clusters in the district, in which the project has been implemented in Phase I, II, and III (excluding the clusters which have already been covered in the previous CM Rounds). As discussed during meeting with PMU on 22nd December 2021, during sampling of CM-VI, care was taken to provide representation to the Talukas which had not been selected yet under previous concurrent monitoring. For this, some Talukas were selected purposefully. Following this approach, 30 clusters for concurrent monitoring round VI were selected. Note that based on the suggestions from PMU, five project clusters were purposively selected in the current concurrent monitoring round such that they belong to phase I and have NRM works implemented in them.

Selection of comparison cluster and villages

15 comparison clusters are selected for concurrent monitoring round VI. The non-PoCRA watershed clusters are selected after matching them with PoCRA clusters based on climate vulnerability index score. It is ensured that a district-wise 2:1 proportion of project and comparison is maintained while selecting comparison clusters. The steps followed to identify the comparison clusters have been detailed below:

Step 1: The number of comparison clusters to be sampled per district is decided while maintaining 2:1 ratio in project and comparison clusters per district.

Step 2: The comparison clusters in each district which had the closest climate vulnerability index score to the sampled project clusters in the corresponding district are selected.

Step 3: A comparable non-PoCRA cluster is identified for every sampled PoCRA cluster. It means a total 30 non-PoCRA clusters are identified for the selection of comparison group for the concurrent monitoring.

Step 4: Finally, 15 non-PoCRA clusters are randomly selected from these 30 clusters while ensuring that the district-wise proportion of comparison clusters are maintained.

Selection of Beneficiaries

In line with the ToR, a total of 15 beneficiaries were surveyed from each sampled cluster/village. In earlier rounds, out of these 15 beneficiaries, 9 beneficiaries were under individual beneficiary category and 6 were community beneficiary category. As decided during the meeting on 22nd December 2021, in project clusters, the number of quantitative interviews in the FPC category was reduced from existing 5 to 3 community beneficiary samples in which 2 Board of Directors and 1 member were covered. Similarly, in case of SHG category, 4 community beneficiary samples were reduced to 2 samples. The reduced number of interviews under community beneficiary category (32 in FPCs and 16 in SHGs) were adjusted in individual beneficiary (DBT) category by increasing 48 samples. Therefore, the total samples under individual beneficiary category in project areas was 318 instead of 270 earlier proposed whereas under community beneficiary category, 132 samples was covered instead of earlier proposed 180 in project clusters. Thus, in CM-VI, out of total 15 beneficiaries, 10 to 11 beneficiaries in each selected village were under individual beneficiary category and 4 to 5 were under community beneficiary category.

Out of total 10 to 11 respondents under individual beneficiary category, it was proposed that six to seven respondents would be chosen from list of Direct Benefit Transfer (DBT) applicants and four respondents were chosen from the list of FFS participants. Further, out of these four respondents from FFS, one was a host farmer and remaining three respondents were guest farmers (including one female guest farmer). These nine beneficiaries were selected randomly from the list of beneficiaries for the sampled village. In case a selected beneficiary is not available on the day of survey, a replacement for the respective sample was identified randomly to ensure adequate sample coverage.

Community beneficiaries are classified into four categories

a) beneficiaries for natural resource management (NRM) activities

b) beneficiaries of community farm pond

c) members of project supported Farmer Producers Company/ Farmer Producers Organisations (FPCs/FPOs)

d) members of project supported Self Help Groups (SHGs).

The sample frames of NRM works implemented, community farm ponds developed, project supported FPCs and SHGs were taken from the PMU team. Beneficiaries or potential beneficiaries living in the catchment area of the NRM works community intervention was identified with the support of village-level functionaries including Cluster Assistant, Agriculture Assistant, and VCRMC members. The final coverage of the sample was based on the status of execution of individual and community activities in the sampled villages. In case of unavailability of the required number of beneficiaries of the specific category, the beneficiaries available from other categories were surveyed to maintain the sample size.

Apart from the quantitative interview, qualitative interviews have been conducted with the key project stakeholders to get their feedback on the current situation project implementation. The details of the qualitative interviews planned to be conducted are detailed in Table 4.4 below.

Table 4.3 planned quantitative samples

Activity Category	Activity	Sample per Village	Total Sample (Project)	Total Sample (Comparison)	Remarks
Individual Beneficiaries		**10 or 11***	**318**	**159**	Total of 477 individual beneficiaries proposed to be surveyed *Individual beneficiaries in total 30 Project villages planned to be covered as follows: a) 11 beneficiaries planned to be interviewed in each of 18 project villages with high intensity of PoCRA interventions.

					b) 10 beneficiaries planned to be interviewed in each of remaining 12 project villages
	DBT Matching Grant beneficiaries				
	Pre sanction received and following stages	2			
	Beneficiaries receiving disbursement	4 or 5			Depending on whether total of 10 or 11 individual beneficiaries to be covered in given village
	FFS beneficiaries				
	Host Farmer	1			Two male and one female guest farmer were to be sampled.
	Guest Farmer	3			
Community Beneficiaries		**4 to 5**	**132**	**66**	Total of 198 community beneficiaries planned to be surveyed
	Beneficiaries of NRM activities		50	25	NRM beneficiaries from sampled project and comparison villages having NRM works.
	CFP beneficiaries		18	9	Randomly selected from project and comparison villages having CFP beneficiaries.
	FPC members		48	24	3 members (2 board member+1 general member) from 16 project supported FPCs and from 8 FPCs in comparison or other villages.
	SHG members		16	8	2 members each from 8 SHGs in project and 4 SHGs in comparison villages (one in each district)
Target Sample		**15**	**450**	**225**	Total of 675 beneficiaries planned to be surveyed.

Table 4.4 planned qualittaive samples

Target Respondent	Sample and Approach	Enquiry Technique	Remarks
VCRMC Representatives	– 30	– Discussion with VCRMC Representatives	Investigation on all project activities implemented in their village (viz. capacity building, implementation, challenges, and suggestions for course correction)
Agriculture Assistant (AA)	– 30	– IDI with AA	Investigation on all project activities implemented at village level (viz. implementation, challenges, and suggestions for course correction)
Cluster Assistant (CA)	– 30	– IDI with CA	Investigation on all project activities implemented at village level (viz. implementation, challenges, and suggestions for course correction)

Target Respondent	Sample and Approach	Enquiry Technique	Remarks
Farmer Producer Company/ Organisation (FPC/FPO) Representatives	– 16 *Two FPO/PFC representative interview per district*	– IDI with FPC/FPO Representatives (Board of Director)	Investigation on support from PoCRA (viz. support received, process bottlenecks, and suggestions for course correction)
Project Specialists (PS Agriculture, PS Agribusiness, PS HRD) implementing PoCRA in districts	– 8 *Discussion with PS in all eight project districts*	– Discussion with Project Specialists	Investigation on all project activities implemented in their district (viz. implementation, challenges, and suggestions for course correction)
Sub-Divisional Agricultural Officer (SDAO)	– 8 One SDAO randomly selected from list of SDAOs of sampled sub-divisions in each district	– IDI with SDAO	Investigation on all project activities implemented in their district (viz. implementation, challenges, and suggestions for course correction). Feedback on the role of Agriculture Supervisor and Takula Officer
Krushi Tai (KT)	– 15 *Randomly selected from the 30 sampled PoCRA villages*	– IDI with KT	Feedback on project related activities implemented by KT
Farmer Field School (FFS) Facilitator	– 15 *Randomly selected from the 30 sampled PoCRA villages*	– IDI with FFS Facilitator	Investigation on implementation of FFS at village level (viz. implementation, challenges, and suggestions for course correction)
FFS Coordinator	– 8 *One FFS co-ordinator randomly selected from* list of FFS Coordinators of sampled villages in each district	– IDI with FFS Coordinator	Investigation on implementation of FFS in their district (viz. implementation, challenges, and suggestions for course correction)
Agriculture Supervisor (AS)	– 8 *One AS randomly selected from* list of ASs of sampled villages in each district	– IDI with AS	Investigation on project activities which are part of the scope of the AS (viz. implementation, challenges, and suggestions for course correction)
Taluka Agriculture Officer (TAO)	– 8 *One TAO randomly selected from* list of TAOs of sampled villages in each district	– IDI with TAO	Investigation on project activities which are part of the scope of the TAO (viz. implementation, challenges, and suggestions for course correction)
District Superintendent Agriculture Officer (DSAO)/Project Director Agricultural Technology Management Agency (PD ATMA)	– 8 *IDI with DSAO and PD ATMA in all eight project districts*	– IDI with DSAO/ PD ATMA	Investigation on all project activities implemented in their district (viz. implementation, challenges, and suggestions for course correction)

5. Sample Covered for Process Monitoring

5.1. Quantitative Data

The sample was targeted based on the above-mentioned sampling approach. However, as mentioned earlier, the actual sample covered depends on the implementation status of project interventions and the availability of beneficiaries in the sampled villages.

A total of 450 respondents in the project and 225 respondents in comparison villages were covered. Of the 450 respondents covered in the project area, 318 respondents were for individual interventions and 172 for community interventions. In the comparison area, of the 225 respondents, 172 beneficiaries were from the category of individual benefits and 53 beneficiaries were from the category of community benefits. The distribution of samples across district is shown in the map below.

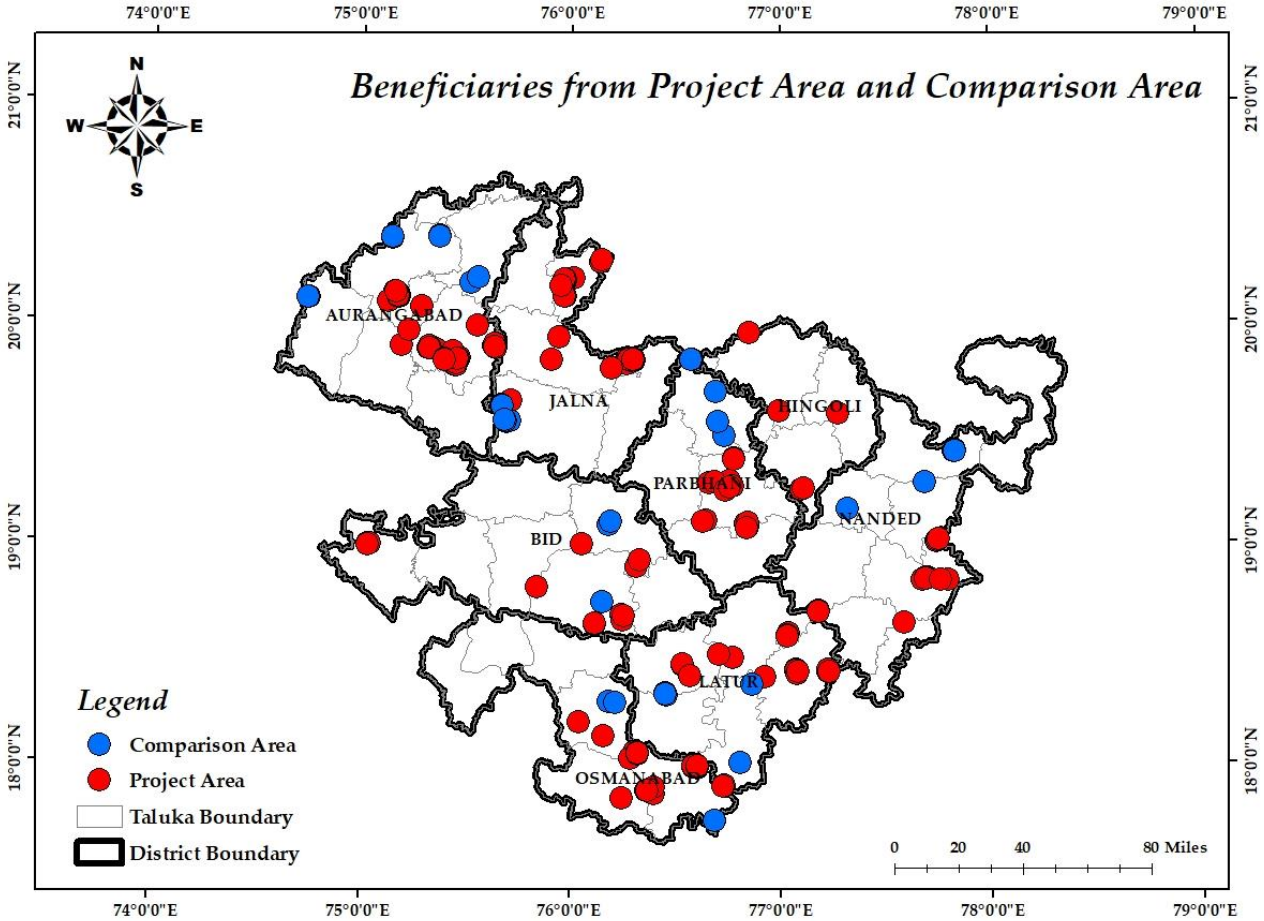
Table 5.1 District-wise quantitative sample coverage in project and comparison villages

District	Project	Comparison	Total
Aurangabad	82	42	130
Beed	52	30	82
Hingoli	31	15	46
Jalna	90	33	123
Latur	53	35	88
Nanded	36	25	61
Osmanabad	65	25	90
Parbhani	41	14	55
Total	**450**	**225**	**675**

Table 5.2 Category wise quantitative sample coverage in project and comparison villages

District	Project	Comparison	Total
Individual	**318**	**172**	**490**
DBT (pre-sanction approval not received)	60	30	90
DBT (pre sanction approval received)	136	136	272
FFS- Host Farmer	33	2	35
FFS- Guest Farmer	89	4	93
Community	**132**	**53**	**185**
NRM Community works	50	50	100
Community Farm Pond	18	0	18
FPC Member	46	3	49
SHG Member	18	0	18
Total	**450**	**225**	**675**

The spatial distribution of sample beneficiaries covered during the survey is presented below:



5.2. Qualitative Data

For collecting the qualitative data, key project stakeholders from the sampled project clusters were interviewed. A total of 170 samples (37 FGDs and 133 indepth interviews) covering various key stakeholders of PoCRA project were conducted under qualitative survey . Table 5.3 presents the samples of various categries which were covered under CM-VI. The sample shortfall in a few cases was due to the unavailability of the stakeholders for the survey during the time of visit especially due to their health reasons or personal emegency.

Table 5.3 Qualitative respondents

S.No.	Research Tool	Samples Covered
1	FGD with VCRMC Members	29
2	IDI with AA	28
3	IDI with CA	24
4	IDI with FPO representatives	16
5	IDI with TAO	8
6	IDI with AS	8
7	IDI with SDAO	6

S.No.	Research Tool	Samples Covered
8	FGDs with PS	8*
9	IDI with DSAO/PD ATMA	5
10	IDI with FFS Facilitator	15
11	IDI with FFS Coordinator	8
12	IDI with Krushi Tai	15
Total		170

*For Project Specialist interviews, in Aurangabad (2), Hingoli (1), Nanded (1) and Parbhani (1), some project specialists were not available for interviews despite prior intimation to them.

Experts' Field Visits

The experts' field visits were also conducted to get insights on project implementation. The team leader-cum-monitoring and evaluation expert, environment expert, sociology expert, GIS expert, agronomy expert, agrieconomist and agribusiness expert visited field and submitted the report. Given the COVID pandemic situation and because of health reason, hydrology and agribusiness experts could not visit field although they contributed to data analysis and participated in various discussion.

6. Main Findings

6.1. Respondent's socio-economic profile

As beneficiaries were selected by considering representation to different categories of beneficiaries as per sampling design, the proportion of different socio-economic categories mentioned in this section does not fully reflect the representation of the actual population of the area. Also, information about caste types, educational status, and status of ration cards are based on responses of respondents, and no detailed physical verification has been conducted. However, it provides an indication of current coverage of PoCRA benefits covering different socio-economic groups, and it would help in deciding required steps to make the program more equity oriented ensuring benefits reaching all strata of the population, including women farmers and farmers from other backward castes, scheduled castes, scheduled tribes, nomadic tribes and the farmers who are illiterates or do not have formal education.

Gender: Nearly 85% of respondents in project and 95% of respondents in comparison clusters were male beneficiaries. Around 84% of total interviews were given by beneficiaries themselves.

Social category: Majority of respondents belonged to the general/open category. The distribution of respondents based on social category is as follows:

Table 6.1 Social category of respondents

Social Category	Project (%)	Comparison (%)
	N=450	N=225
General/ Open	66	73
Scheduled Caste (SC)	4	4
Scheduled Tribe (ST)	7	5
Other backward class (OBC)	14	8
Nomadic Tribe (NT)	8	8

Others	1	2
Total (%)	100	100

Education: As can be seen from the following table, the educational attainment of respondents in project villages was slightly better than in comparison villages. One-tenth of respondents in project and slightly more than 15% respondents in comparison villages were found to have not attended any school.

Table 6.2 Educational background of respondents

Education	Project (%)	Comparison (%)
	N=450	N=225
No schooling	10	16
Primary school (upto class 5th)	13	20
Middle school (upto class 8th)	10	15
Secondary school (upto class 10th)	24	16
Senior secondary school (upto class 12th)	20	15
Diploma but not graduate	2	1
Graduate	16	12
Post-graduate	5	5
Total	100	100

Poverty status: Around 71% of respondents in project and 60% in comparison belonged to Above Poverty Line (APL) category as per their ration card status, 28% in project and 39% in comparison belonged to BPL, and rest 1% were not aware of their poverty level category.

Marital Status: Around 92% of respondents in both the project and comparison clusters were married. Approximately 7% of the respondents in both the project and comparison villages were unmarried. The sample also included five widows in the project and one in the comparison cluster.

Household size and family type: On average, the total number of members in a household in both project and comparison clusters were six. Nearly 86% of respondents in the project and 81% in comparison clusters stayed in a joint family.

Source of income: Farming/agriculture is the primary source of income for nearly all respondents in both project as well as comparison clusters. Apart from agriculture, the other sources of income for sample households were livestock, unskilled wage labor, micro-enterprises, skilled worker, salaried worker and contractual workers. This implies dependence of sample households on agriculture as primary source of income.

Table 6.3 Source of income of respondents (multiple sources)

Source of Income	Project (%)	Comparison (%)
	Valid N=450 (Multi response)	Valid N=225 (Multi response)
Farming/Agriculture	98.4	99.6
Livestock (goats, poultry, piggery, fishery & dairy)	14.4	9.8

Source of Income	Project (%)	Comparison (%)
	Valid N=450 (Multi response)	Valid N=225 (Multi response)
Unskilled wage labor (agricultural labor, MGNREGA, labor, construction etc.)	2.9	3.6
Micro-enterprises (kirana shops, dhabas, mobile shops, ferry shops etc)	3.8	4
Skilled worker (tailoring, masonry, electrician, plumbing, carpentry, etc.)	1.3	1.3
Salaried worker (teachers, anganwadi teacher etc.)	1.8	0.4
Contractual or task-based work	2.7	0.4

Annual income: The average annual income for respondent households from all sources in project and comparison clusters is Rs. 191,571/- and Rs. 149,666/- respectively.

Table 6.4 Average annual income of respondents

Cluster	N	Mean Income (INR)	Std. Dev	95% CI	
Project	450	191,571	212,182	171,914	211,228
Comparison	225	149,666	167,699	127,635	171,698

Membership in community organizations: 54% of respondents in project clusters and 51% of respondents in comparison clusters reported that at least one person from their households is a member of self-help groups (SHG). Further, at least one person from nearly 14% of respondents' households in project clusters had membership in Farmer Producer Company (FPC). Whereas in the case of comparison clusters, 7% respondents' households had a member who was part of FPC. At least one person from nearly 14% of respondents' households in project clusters, was part of VCRMC. Except for 6% respondents' households in the project and 3% in comparison cluster, none of the respondents or members of their household was part of district/block level marketing committee, or agriculture produce marketing committee. This reflects farmers in project clusters had better participation in community organizations than comparison clusters. However, it is observed that still there is adequate scope to facilitate and motivate farmers to participate in community organizations especially in SHGs, FPCs and value chain institutions.

6.2. Land ownership and cultivation practices

Land ownership: All respondents' households in the comparison and almost all the respondents' households (except six) in project clusters owned agricultural land. Women in about 48% of respondents' households in project clusters owned agriculture land, while in comparison clusters, the proportion for the same was 34%. The average agriculture landholding in the project cluster is 5.8 acres, and that in comparison cluster is 4.8 acres. Of the average agriculture land holding in both types of clusters, nearly all lands are cultivable. Eight respondent households in project clusters have leased in on land with an average size of 3.8 acres of agricultural land, while in comparison clusters 6 respondent households have on an average leased-in land size of 3 acres. As can be seen from the table below, nearly half of the respondent households in the project (50%) and comparison (59%) belonged to small and marginal farmers (those who owned less than 2 Ha of land).

Table 6.5 Category of farmers covered in the household survey

Category of farmers	Project (%) N = 450	Comparison (%) N = 225
Small & Marginal (less than 2 Ha)	50	59
Medium (between 2 to 5 Ha)	40	38
Large (more than 5 Ha)	10	3

Cultivation: In the project cluster, in Kharif season, nearly 95% of the total respondents cultivated their land with an average of 5.5 acres per household. Similarly, 88% of total respondents cultivated Rabi crops (on average of 4.4 acres per household), and 10% respondents cultivated Summer crop (on an average of 5.3 acres per household) in last 12 months. The same is true for comparison clusters. Around 99% of respondents cultivated Kharif crop (on an average of 4.6 acres per household), 88% of respondents cultivated Rabi crop (on an average of 3.7 acres per household), and 9% cultivated summer crop (on average of 2.4 acres per household).

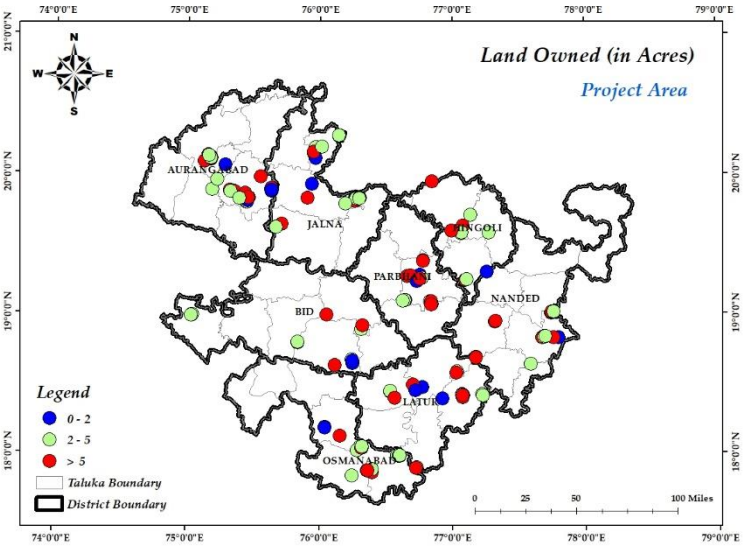
Irrigation: Nearly 94% (increased by 4% compared to CM IV round) of respondents in project clusters had irrigation source, while in comparison 91% had the irrigation facility. No change is observed when compared to CM V round In project clusters, the sources of irrigation in order of adoption by respondent households are open dug well, borewell, farm pond, canal/river, and earthen/check dam. While in comparison clusters, the order of adoption for the source irrigation are open dug well, borewell, canal/river, earthen/check dam, and farm pond. Both in project and comparison clusters, open dug well and borewell was found to be a major source of irrigation, as the following table reflects. However, open dug well is more prominent in project clusters (76%) than comparison clusters (69%) and also slightly more than one-tenth respondent in comparison areas reported canal/river as a major source of irrigation which was found to be less in project clusters (4%).

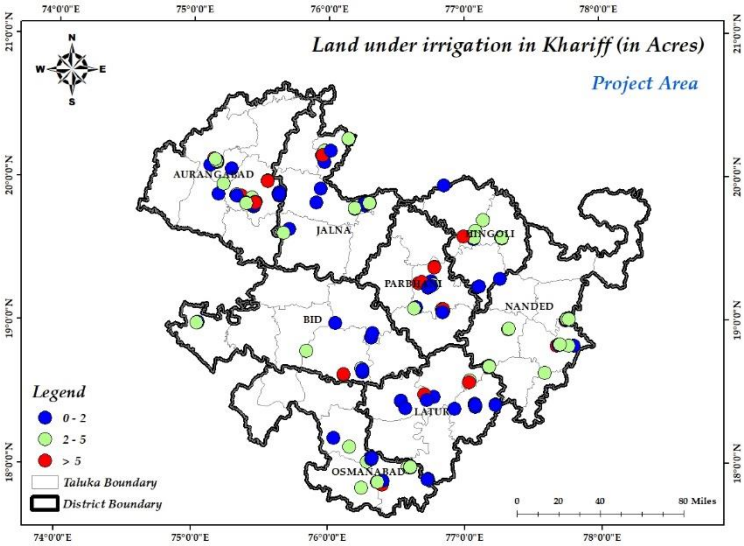
Table 6.6 Source of irrigation

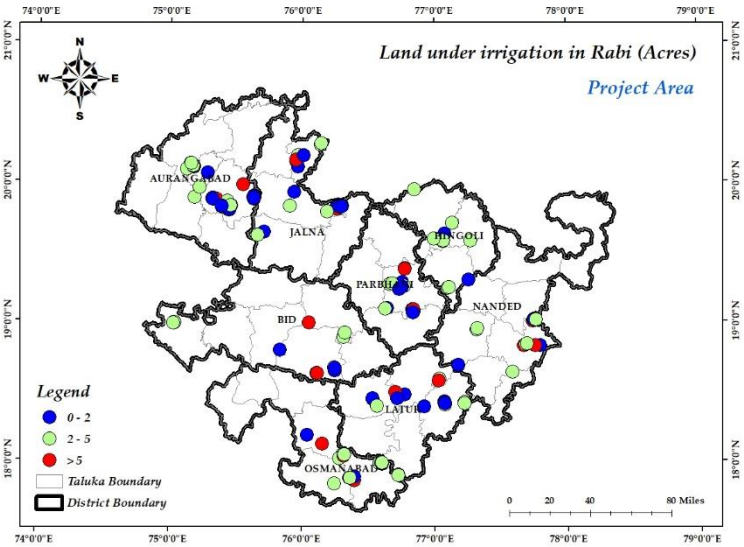
Source of irrigation	Project (%)	Comparison (%)
	Valid N = 416 (Multi response)	Valid N = 201 (Multi response)
Open dug well	76	69
Borewell	26	25
Farm pond	12	2
Canal/river	4	13
Earthen/ check dam	1	3
Total (%)	100	100

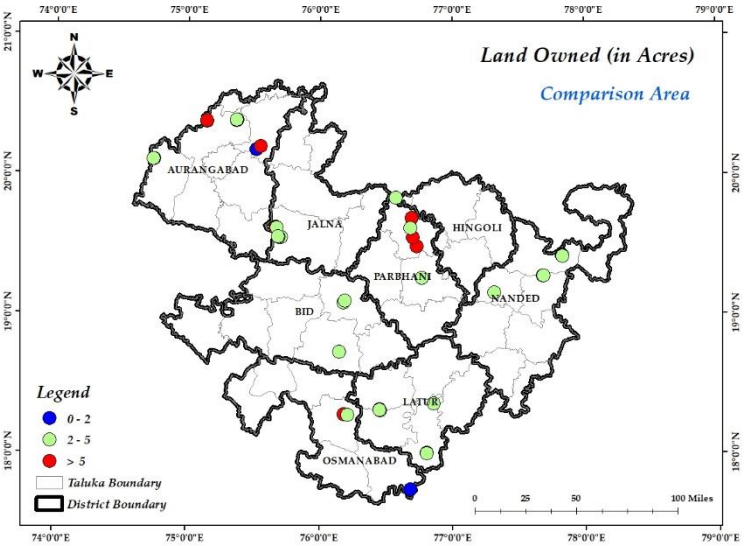
Average irrigated area under different cropping seasons: In project clusters, on an average 4.9 acres of land with Kharif crop, 4.2 acres of land with Rabi crop, and 5.2 acres of land with summer crop was under irrigation in the past 12 months. Similarly, in comparison clusters, on an average 3.9 acres of land with Kharif crop, 3.6 acres of land with Rabi crop, and 2.4 acres of land with summer crop was under irrigation in the past 12 months. Around 15% (increased by 1% when compared with CM V round) of respondents in project clusters and 11% respondents in comparison had their land (on average of 2.6 and 2 acres respectively) under orchards plantation. The average age of orchards is 5 years in project and 3 years in comparison areas.

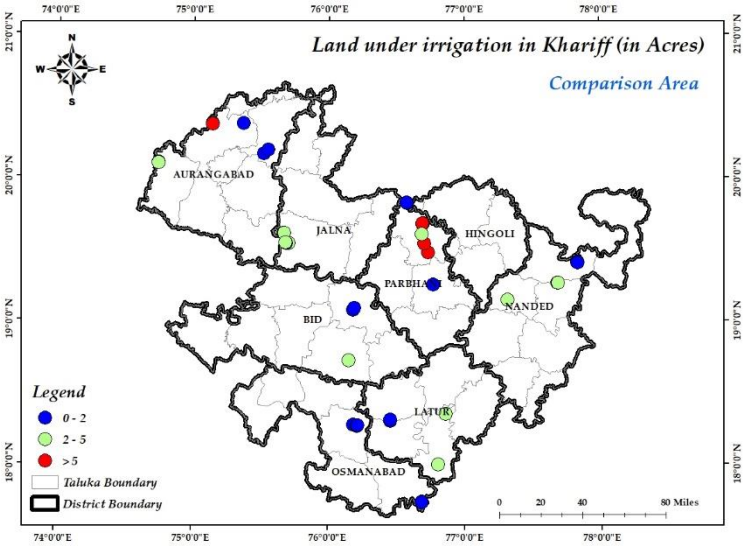
The spatial distribution of beneficiary response on land owned, land under irrigation in Khariff and Rabi cropping season for both project and comparison areas has been presented below:

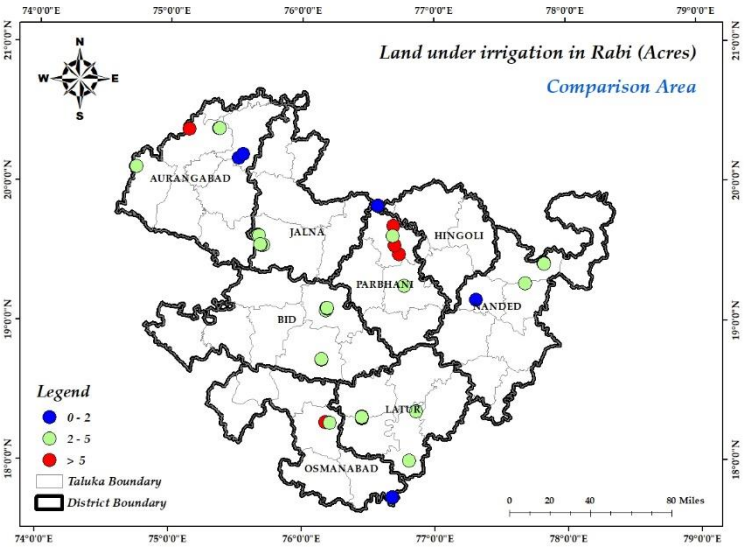

Land Owned (in Acres)
Project Area
AURANGABAD
JALNA
HINGOLI
PARBHANI
NANDED
BID
LATUR
OSMANABAD
Legend
0 - 2
2 - 5
> 5
Taluka Boundary
District Boundary
0 25 50 100 Miles


Land under irrigation in Khariff (in Acres)
Project Area
AURANGABAD
JALNA
HINGOLI
PARBHANI
NANDED
BID
LATUR
OSMANABAD
Legend
0 - 2
2 - 5
> 5
Taluka Boundary
District Boundary
0 20 40 80 Miles


Land under irrigation in Rabi (Acres)
Project Area
AURANGABAD
JALNA
HINGOLI
PARBHANI
NANDED
BID
LATUR
OSMANABAD
Legend
0 - 2
2 - 5
>5
Taluka Boundary
District Boundary
0 20 40 80 Miles


Land Owned (in Acres)
Comparison Area
AURANGABAD
JALNA
HINGOLI
PARBHANI
NANDED
BID
LATUR
OSMANABAD
Legend
0 - 2
2 - 5
> 5
Taluka Boundary
District Boundary
0 25 50 100 Miles


Land under irrigation in Khariff (in Acres)
Comparison Area
AURANGABAD
JALNA
HINGOLI
PARBHANI
NANDED
BID
LATUR
OSMANABAD
Legend
0 - 2
2 - 5
>5
Taluka Boundary
District Boundary
0 20 40 80 Miles


Land under irrigation in Rabi (Acres)
Comparison Area
AURANGABAD
JALNA
HINGOLI
PARBHANI
NANDED
BID
LATUR
OSMANABAD
Legend
0 - 2
2 - 5
> 5
Taluka Boundary
District Boundary
0 20 40 80 Miles

Crops Grown in Various Seasons:

Kharif Season: The most common Kharif crops cultivated in both project and comparison clusters included Cotton, Pigeon pea and Soybean. Some of the other Kharif crops cultivated were Chick pea, Sorghum, Black gram, Green gram, Maize, Sugarcane, Turmeric, Ginger, Onion and Millet.

Rabi Season: The most common Rabi crops cultivated in both project and comparison clusters included Chickpea, Sorghum, and Wheat.

Summer Season: Vegetables like Onion and Tomato are mostly grown in summer.

Annual Crop: Banana, Papaya, Guava, Sweet Lime, Lemon, and Orange are common crops sown annually.

Crop damage: Crop damage is an important issue faced by farmers in both project and comparison clusters. It was observed that nearly 88% of respondents in both the project and comparison clusters faced crop damage. The crop-wise distribution of the crop damage response is presented in the table below.

Table 6.7 Crops grown and damage faced by respondents in various seasons

Season wise crops	Percentage respondents growing crops		Percentage respondents facing crop damage	
	Project (%)	**Comparison (%)**	**Project (%)**	**Comparison (%)**
	Valid N = 444 (Multi response)	Valid N = 225 (Multi response)	Valid N=390 (Multi response)	Valid N=199 (Multi response)
KHARIF				
Soyabean	72.5	60.9	67.4	61.8
Cotton	44.1	52	38.9	45.2
Pigeon pea	29	30.7	17.4	20.6
Sugarcane	6.9	8.4	1.28	2
Black gram	6.9	0.4	3.8	0.5
Green gram	5.2	2.2	2.5	1.5
Maize	5.4	10.7	3.8	7.5
Turmeric	4.7	2.2	1.8	2
Millet	3.2	1.8	2.3	2
Ginger	0.2	0.9	0.3	0.5
RABI				
Chickpea	60.4	55.1	21.8	27.1
Sorghum	21.2	20.9	6.4	5.5
Wheat	27.3	23.6	10.3	8
SUMMER				

Season wise crops	Percentage respondents growing crops		Percentage respondents facing crop damage	
Onion	10.1	8.4	5.4	4
Tomato	0.9	0.9	0.51	0.5
ANNUAL				
Mango	1.8	0.9	0.3	0
Guava	2.5	-	1.0	0
Sweet Lime	4	4	2.1	2
Chilli	1.6	0.9	-	1
Lemon	0.5	-	-	-
Groundnut	0.9	3.1	0.5	1
Watermelon	0.9	-	0.3	-
Potato	-	-	-	-
Capsicum	-	-	-	-
Cucumber	0.7	-	-	-
Papaya	0.5	-	-	-
Cabbage	0.2	0.4	-	-
Cauliflower	0.2	0.4	-	-
Banana	1.1	2.2	-	0.5
Orange	0.2	-	-	0.5
Pomegranate	1.8	4	1.5	-
Apple Ber	-	-	-	-
Flat Bean (Saim)	-	-	-	-
Lathyrus	-	-	-	-
Ridge Gourd	0.5	-	-	-
Others	3.4	1.3	0.77	-

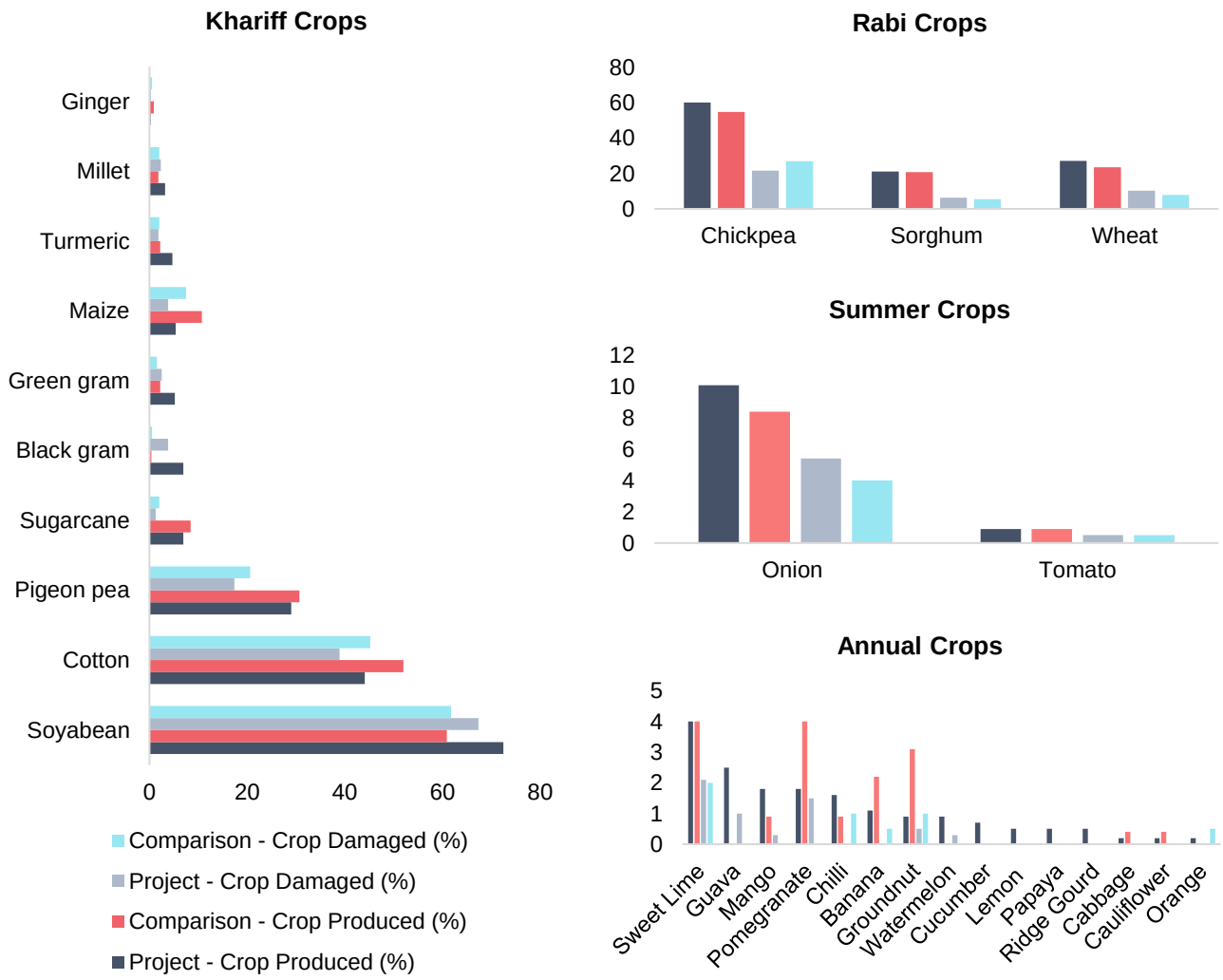


Figure 6.1 Crops grown and damage faced by respondents in various seasons

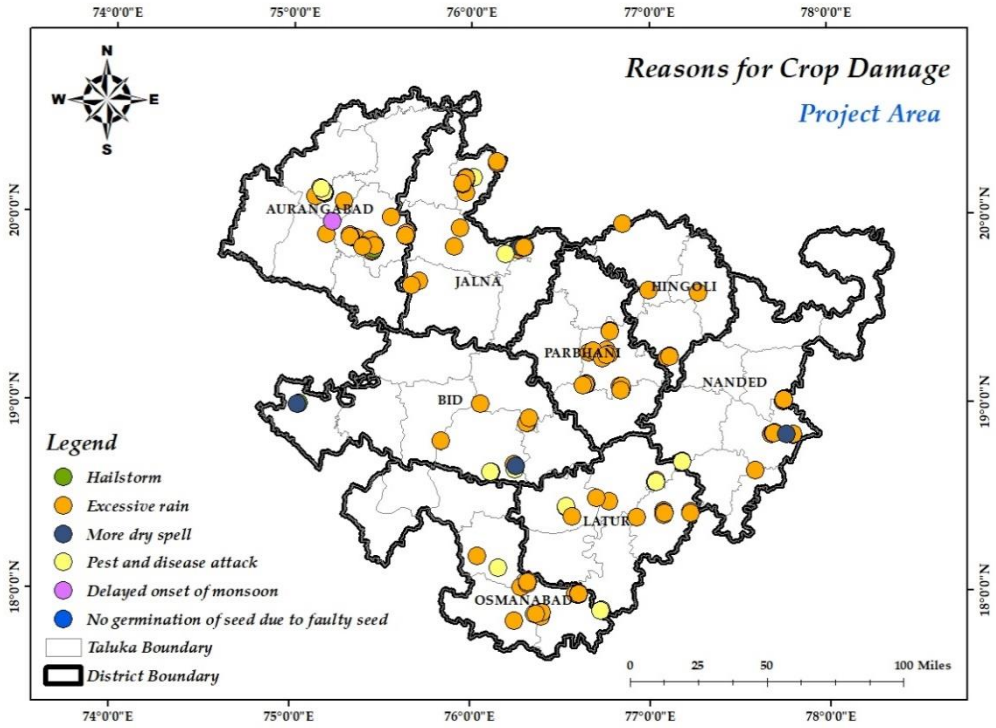
The primary reason for crop damage in both project and comparison clusters is excessive rain, dry spell, and hailstorm. Nearly 11% of respondents in both project and comparison clusters faced crop damage due to pest and disease attacks. The reasons for crop damage in project and comparison clusters are as follows:

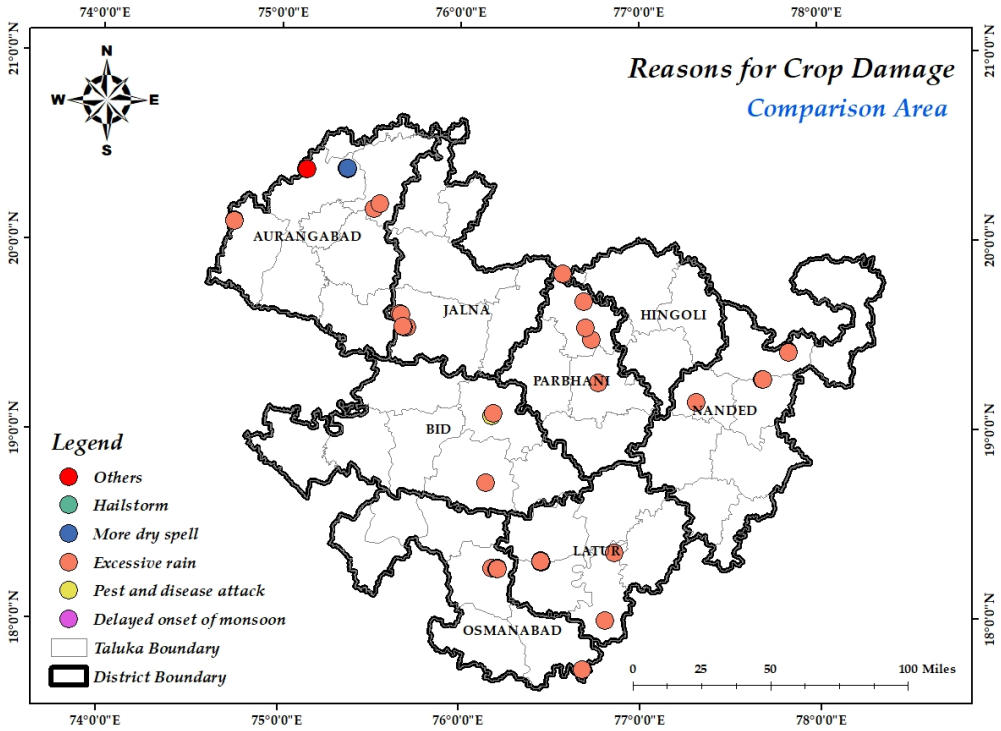
Table 6.8 Reasons for crop damage

Reasons for crop damage	Project (%)	Comparison (%)
	N=390	N=199
Excessive rain	81.3	83.4
Delayed onset of monsoon	0.7	1.5
Dry spell	3.6	3
Pest and disease attack	11.3	10.5
No germination of seed due to faulty seeds	0.7	-
Hailstorm	2.3	0.5

Reasons for crop damage	Project (%)	Comparison (%)
	N=390	N=199
Other reasons	-	1

The spatial distribution of beneficiary response on reasons of crop damage in both project and comparison areas has been presented below:





Most of the damage in Kharif crops in both clusters is experienced during the harvesting stage. Most of the respondents also shared that damage occurs in Kharif crops at the pod development and flowering stage as well.

Table 6.9 Table 0.9: Stage of Kharif crop damage

Stage of damage for Kharif crop	Project (%)	Comparison (%)
	390	N=199
At and after the sowing stage	4.4	4.5
At flowering stage	18.2	17.1
At pod development stage	31	31.6
Harvesting stage	46.4	46.8

Land under certified seeds

One of the key objectives of the project is to promote the use of certified varieties of climate resilient seeds. To validate this objective, respondents in both project and comparison clusters were asked about the area under cultivation for each crop using certified seeds. It was observed that the overall area under certified seeds was relatively higher in comparison villages as compared to project villages.

The area under cultivation using climate-resilient certified seed varieties for chickpea was 63% in project and 56% in comparison areas. The land under certified seeds for soyabean was higher in comparison area (86%) as compared to project areas (76%). Same was the case for pigeon pea, wherein it was observed that the comparison sample had a higher percentage of the land (41%) under certified seeds as compared to the project (37%). However, the overall percent of land under certified seeds for these three crops in both the project and comparison areas is 66%. However, when compared to CM IV and CM V rounds, the percentage of land under certified seeds for these three crops occured to be slightly reduced. The reason could be the selection of villages from sampled talukas which were considered for analysis in this round. Those talukas which were not covered during any of the previous concurrent monitoring rounds were covered in the current round. Hence, effort are needed to promote use of certified seeds in these talukas.

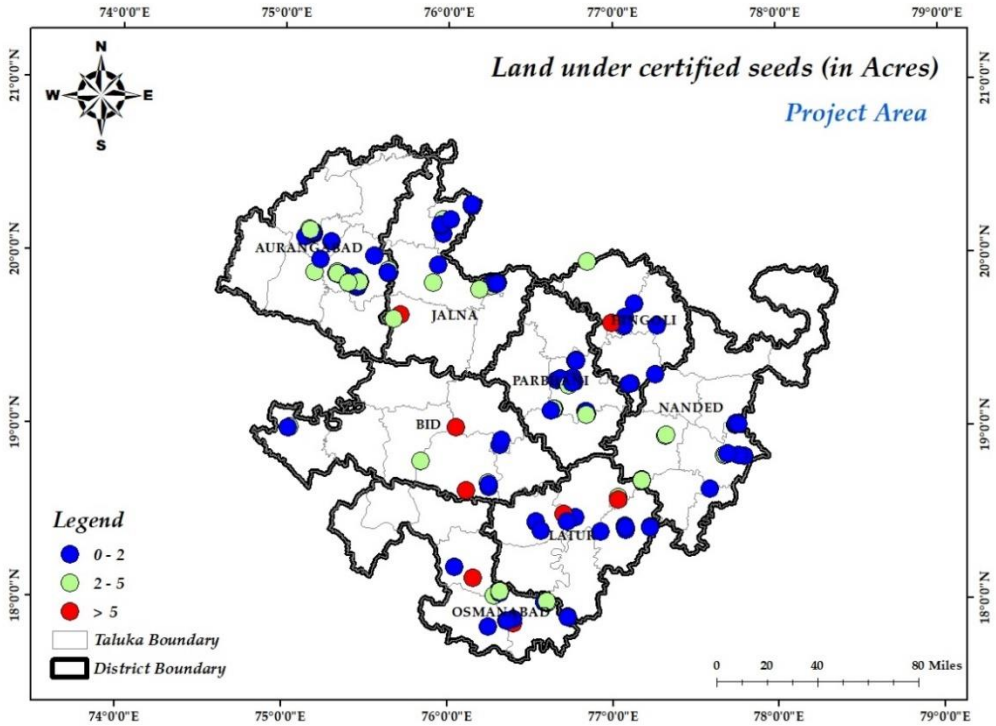
Table 6.10 Land under climate seed varieties for specified crops in the study area

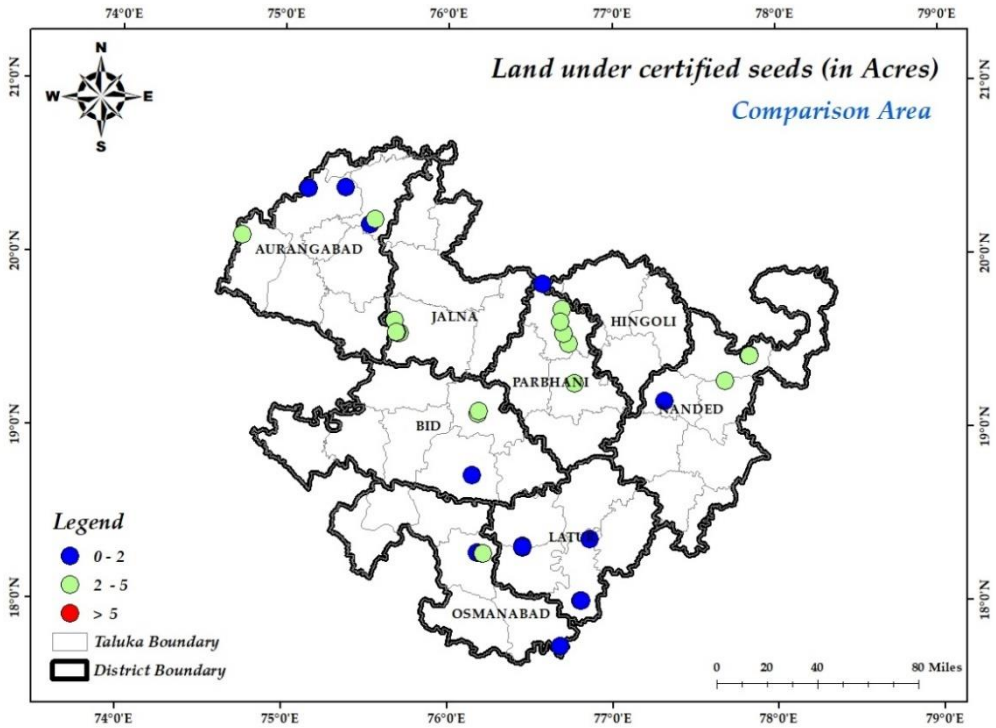
Crop	Land under production (acres)		Land under climate resilient seed varieties (acres)		% Land under climate resilient seed varieties	
	Project	Comparison	Project	Comparison	Project	Comparison
Soybean	1193 (N = 322)	369 (N = 137)	910 (N = 253)	318 (N = 113)	76	86
Pigeon pea	285 (N = 129)	155 (N = 69)	106 (N = 58)	64 (N = 34)	37	41
Chickpea	850	338	533	189	63	56

	(N = 268)	(N = 124)	(N = 165)	(N = 72)		
Overall	2328	862	1549	571	66	66

(An independent two sample t-test was done to compare the means of land under certified seeds for Soybean, Pigeon pea, and Chickpea estimated for CM VI and CM V rounds. The resulting means for each crop in the CM VI round are statistically significant when compared to those estimated using CM V dataset at 95% confidence level.)*

The spatial distribution of beneficiary response on land under certified seeds in both project and comparison areas has been presented below:





Willingness to adopt climate-resilient technologies promoted under project: Nearly 90% of respondents in project clusters showed a willingness to adopt the CRATs.

Follow of agrometeorological advisory: It is observed that 45% of respondents in project clusters as compared to 35% in comparison clusters, showed interest in following the agrometeorological advisory regularly.

Treating soil using soil health card information: Nearly 79**%** of respondents in comparison clusters did not have soil health cards as compared to 59% of respondents in the project. It was observed that more respondents in project clusters (39%) as compared to those in comparison (20%) treated the soil using soil health card information. Around 33% in project clusters did not find the information on soil health cards useful. About 33% of respondents from both clusters reported that they did not have the technical knowledge to use the soil health information.

Response on the mobile app: Responding to the question if they would like to get a mobile app for agriculture and allied activity related information or advisory services, the majority of respondents both in the project (83%) and comparison (81%) clusters responded positively. Majority of respondents across all districts and social categories seek advisory in the mobile app on key aspects such as climate resilient technology, weather, soil nutrient, NRM, fertilizer (chemical and bio), certified seeds, pesticides (chemical and bio), crops (food/cash/plantation), irrigation and crop pest/disease. However, attention should also be given to those advisories on which the respondents recorded low demand. Generating awareness among project beneficiaries about crop residue disposal, organic farming, horticulture, market for agriculture produce, agri-business, poultry/ goatry/ fishery, and environment safeguards must be prioritized.

The distribution of responses on various advisory features on a mobile app for both clusters are listed below.

Table 6.11 Response on advisory features on a mobile app

Advisory feature on a mobile app	Project (%) (Multi response)	Comparison (%) (Multi response)
Climate resilient technology	56.5	50.0
Weather	76.4	66.2
Soil nutrient	50.9	54.1
Natural resource management	42.8	43.2
Fertilizer (chemical and bio)	27.3	45.9
Certified seeds	31.3	45.5
Pesticides (chemical and bio)	27.5	40.9
Crop (Food/ Cash/ Plantation)	32.6	40.5
Irrigation	36.3	45.5
Crop pest/ disease	22.3	34.2
Crop residue disposal	11.5	20.3
Organic farming	7.6	10.8
Horticulture	3.8	6.3
Markets for agri produce	2.3	0.9

Advisory feature on a mobile app	Project (%) (Multi response)	Comparison (%) (Multi response)
Agri-business	3.4	3.2
Poultry/ Goatry/ Fishery	2.5	1.8
Environment safeguards	1.1	1.4
Total %	100	100
Valid N	**444**	**222**

6.3. Awareness of project activities

One of the key objectives of concurrent monitoring is to assess the level of awareness of the beneficiaries of the different benefits under PoCRA and other schemes, sources of information, and if they received and adopted any of the agricultural technologies being promoted.

Source of information about PoCRA: The respondents were asked about the source of information through which they came to learn about PoCRA in project areas and about other projects with similar benefits in the comparison area. The most important source of information in project clusters was Gram Panchayat Members (79%), project staff (52%) - which includes Agriculture Assistant, Cluster Assistant, FFS Facilitator, Project Specialist, Krushi Tai, etc.; and VCRMC members (40%). While in the case of comparison villages, information was mostly gained from Gram Panchayat members (60%), through friends and relatives (42%), and through project staff (29%). Other sources include village microplanning activity, advertisements on radio/television, hoardings, and project display boards.

Awareness in project clusters of different benefits: It was observed that 97% (with an increase of 1% since CM IV and 12% since CM II rounds) respondents in project clusters were aware of matching grants for irrigation systems like drip and sprinkler, etc. used for protected cultivation. Nearly 80% of respondents (with an increase of 1% since CM V, 2% since CM IV and 20% since CM II) were aware of support received for construction of farm pond with inlet and outlet, and 72% respondents knew about matching grants received for doing protected cultivation by the construction of shade net, polyhouse, and polytunnel. As compared to individual benefits, it was observed that there was little awareness about NRM works conducted under the project. Also, respondents were less aware of the matching grant support to FPCs and SHGs to start an agribusiness activity.

Table 6.12 Awareness of project benefits in project clusters

Project benefits	Project (%)
Matching grant for the purchase of water pumps/pipes/drip irrigation systems or sprinklers	96.7
Construction of farm pond with inlet & outlet and grass cultivation on burms & inlet channel	79.8
Matching grant for construction of shade net house, poly house, and polytunnels	72.2
Plantation of fruit trees on the boundaries of farmlands/ Horticulture Plantation Mango, Custard Apple, Citrus, etc.	39.7
Matching grant to set up Sericulture/Apiculture/Inland fisheries/backyard poultry unit/goatery	54.6
Matching grant for developing Seed Processing and Seed Testing Infrastructure	28.0
Financial support for repair of existing water harvesting structure and desilting of such structures.	10.2

Project benefits	Project (%)
Production of foundation and certified seed of climate resilient varieties	14.0
Recharge of open dug wells	7.4
Matching grant support to FPC/FPO/SHG for construction of Godown/ small warehouse, custom hiring centre, ripening chamber and primary processing units for fruits and vegetables	4.7
Catchment area treatment using Continuous Contour Trenches (CCT)	2.1
Construction of Subsurface drainage wherever the land slope permits good drainage	2.1
Demonstration of Climate Resilient Agriculture Practices, including BBF, green manuring, contour cultivation, etc. through demonstration through farmer field schools	2.6
Training/Exposure visits to develop capacity of farmers on climate resilient agriculture technologies	1.43
Do not Know	0.9
Total	100

Valid N = 425 (Multi response)

6.4 Training and adoption of CRATs

One of the key aspects of the project is to promote CRATs through training via farmer field schools and increase willingness among the farmers to adopt the same. Regarding the same, the respondents in both project and comparison clusters were asked if they have received any training on CRATs and if they have adopted any of the CRATs in the past one year. The technology-wise distribution of training received and its adoption is detailed below in the table.

Table 6.13 Training and adoption of climate resilient technologies

Technology	Training received						Adoption in past one year					
	Through PoCRA supported FFS		Through other sources		No		Started practicing after training		Already practicing before training		No	
	P	C	P	C	P	C	P	C	P	C	P	C
Contour cultivation	33	0	4	12	63	88	10	0	75	68	16	32
Cultivation by BBF method	30	0	7	12	63	88	11	3	63	58	26	39
Intercropping	31	0	5	12	64	88	8	2	80	76	12	22
Use of improved seed	35	0	7	12	58	88	12	3	83	90	5	7
Seed treatment	32	0	7	11	62	89	11	2	72	72	18	26
INM	31	0	7	11	62	89	10	3	74	78	16	19
IPM	32	0	7	12	60	88	11	3	78	89	12	8
Furrow opening	23	0	8	10	69	90	6	2	53	51	41	48

Technology	Training received						Adoption in past one year					
	Through PoCRA supported FFS		Through other sources		No		Started practicing after training		Already practicing before training		No	
	P	C	P	C	P	C	P	C	P	C	P	C
Foliar spray of 2% Urea at flowering & 2% DAP at boll dev.	29	0	8	12	63	88	11	2	65	79	24	19
Protective irrigation through farm pond	21	0	6	8	73	92	7	1	40	31	53	68
Conservation tillage	27	0	7	11	66	89	7	1	64	69	29	30
Incorporation of biomass	28	0	8	10	64	90	7	3	81	92	13	6
Mulching	23	0	6	9	71	91	5	0	48	40	47	60
Cultivation of citrus crops on broad ridges	16	0	6	10	78	90	5	1	30	26	66	72
Canopy management in fruit Crops	16	0	6	9	79	91	5	1	26	27	70	72
Shade net	12	0	2	4	86	96	3	0	8	11	89	88
Polyhouse	9	0	2	2	89	98	1	0	6	9	92	90
Poly tunnel	8	0	1	2	91	98	1	1	5	5	94	94
Land preparation	24	0	6	6	70	94	3	1	83	84	14	14
Use of machinery	28	0	9	8	64	92	6	0	82	89	13	11
Rainwater Harvesting	19	0	6	7	76	93	5	0	56	55	39	45
Small ruminants	13	0	4	5	83	95	2	0	18	17	80	83
Backyard poultry	9	0	3	2	88	98	2	1	10	13	88	86
Sericulture	8	0	2	2	91	98	2	0	4	6	95	94
Apiculture	6	0	1	1	93	99	0	0	4	3	96	96
Inland fisheries	8	0	3	2	89	98	2	0	4	5	94	95

For Project (P) N=450 and Comparison (C) N=225

It is observed that more percentage of respondents were found to be trained in the project through FFS and other sources. Also, there was higher adoption of CRATs after receiving training in the project as compared to comparison clusters.

Almost all the beneficiaries covered in the project clusters have received at least one training. However, large scale variation was observed in the proportion of farmers receiving different types of training as mentioned in table 19a and 19b.

While analysing the distribution of beneficiaries in project clusters by social categories who did not receive training of CRATs, around quarter were from general categories, 3% from Nomadic tribes, 1% from SC, 0.8% from ST, and 5% from other backward classes. Similarly, with small variation, total beneficiaries in each training type by farmers with different landholding sizes who did not receive training were slightly more than half in cases of medium farmers, slightly more than one-fourth in cases of large farmers, and around one-fifth were small farmers. Within each social category, it has been tried to analyse the proportion of farmers receiving different types of training as depicted in the below table. Although there is variation by training types, more percentage of NTs did not attend the training in comparison to the overall percentage of non-attendance and percentage of non-attendance under other caste categories.

Table 6.14 Percentage of project beneficiaries who received different trainings (% within each social category)

Types of training	% of beneficiaries did not receive the training (all categories)	General (%)	Nomadic Tribes (%)	OBC (%)	SC (%)	ST (%)
Contour cultivation	62	65	68	60	53	33
Cultivation by BBF method	62	64	68	63	53	37
Intercropping	63	65	68	58	68	40
Use of improved seed	57	61	59	47	53	27
Seed treatment	61	61	68	58	58	40
INM	61	63	70	60	58	30
IPM	60	61	62	55	63	37
Furrow opening	68	69	76	69	63	37
Foliar spray of 2% Urea at flowering & 2% DAP at boll dev.	62	63	68	56	79	37
Protective irrigation through farm pond	72	71	84	73	68	57
Conservation tillage	65	66	73	61	74	43
Incorporation of biomass	63	65	73	58	58	40
Mulching	70	71	76	66	79	50
Cultivation of citrus crops on broad ridges	77	79	81	73	74	67
Canopy management in fruit Crops	78	79	73	73	79	67
Shade net	84	83	78	87	84	87
Polyhouse	88	86	86	90	84	90
Poly tunnel	90	89	95	89	84	93
Land preparation	69	69	70	65	79	60
Use of machinery	63	65	54	63	68	50
Rainwater Harvesting	74	74	68	79	79	60
Small ruminants	83	84	76	82	74	83
Backyard poultry	88	87	78	87	89	90
Sericulture	91	89	95	90	95	90
Apiculture	93	91	97	90	95	97
Inland fisheries	89	87	92	87	95	97

Total samples (N)=General-296, Nomadic tribe=37, OBC=62, Scheduled caste=19, Scheduled tribe=30

Within each category of farmers by landholding size, it has been tried to analyse the proportion of farmers receiving different types of training as depicted in the below table. As can be seen, more than 50% of farmers

with different landholding sizes have not received training. It warrants more focus to cover farmers from all categories under different training programmes.

Table 6.15 Percentage of project beneficiaries received different trainings (% within beneficiaries by landholding

Types of training	% of beneficiaries did not receive the training (all categories)	Large farmers (%)	Medium (%)	Small (%)
Contour cultivation	62	58	64	62
Cultivation by BBF method	62	58	62	63
Intercropping	63	63	64	62
Use of improved seed	57	55	55	59
Seed treatment	61	63	59	62
INM	61	61	60	62
IPM	60	61	58	61
Furrow opening	68	63	67	69
Foliar spray of 2% Urea at flowering & 2% DAP at boll dev.	62	58	61	63
Protective irrigation through farm pond	72	66	72	73
Conservation tillage	65	61	65	66
Incorporation of biomass	63	63	62	64
Mulching	70	63	71	70
Cultivation of citrus crops on broad ridges	77	82	80	74
Canopy management in fruit Crops	78	74	84	73
Shade net	84	82	88	82
Polyhouse	88	89	92	84
Poly tunnel	90	95	93	86
Land preparation	69	74	70	68
Use of machinery	63	63	64	62
Rainwater Harvesting	74	74	79	71
Small ruminants	83	79	87	82
Backyard poultry	88	87	90	86
Sericulture	91	84	92	91
Apiculture	93	92	94	92
Inland fisheries	89	87	93	87

Total samples (N)= Large farmers: 38, Medium farmers: 178, Small farmers: 234

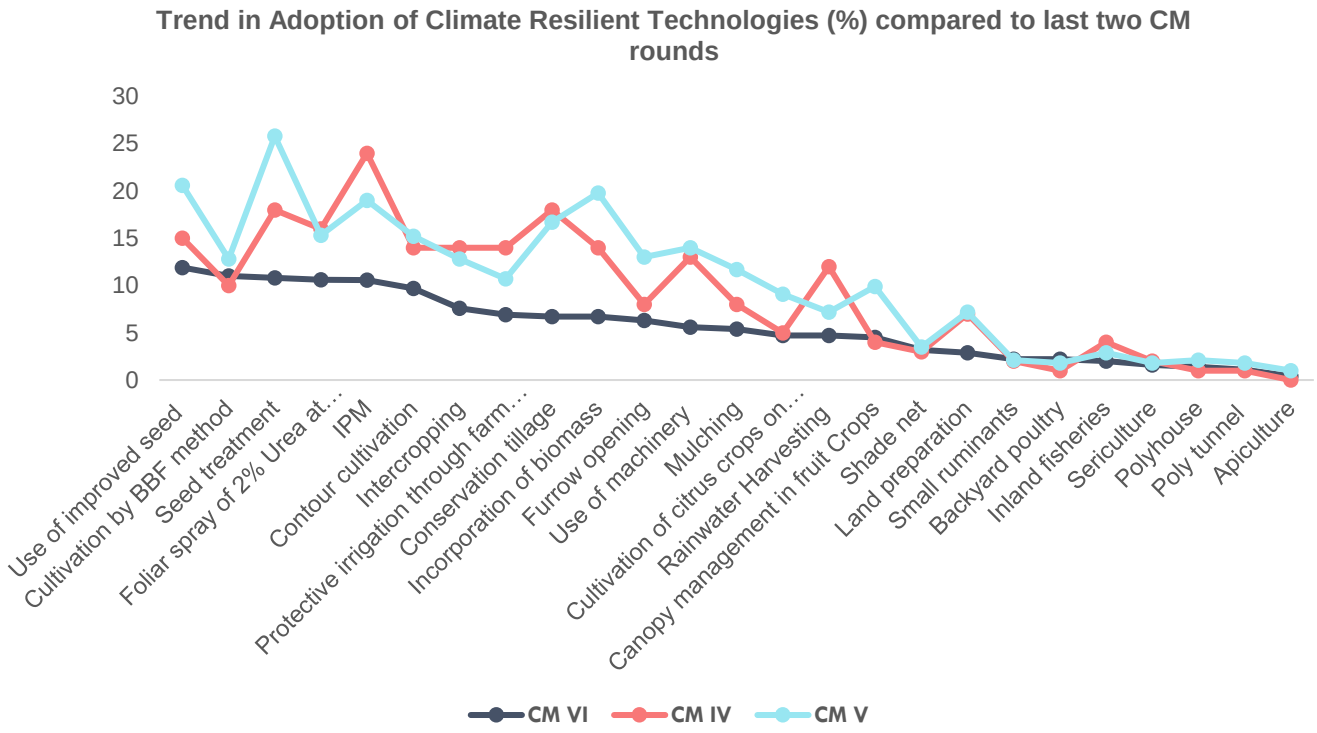


Figure 6.2 Below graph shows the trend in adoption of technologies in current round when compared to previous two rounds:

As noted in the sampling section, care was taken to provide representation to the Talukas which had not been selected so far under previous concurrent monitoring. For this, some Talukas were selected purposefully. The results on adoption rate from first time surveyed taluka are slightly lower than talukas which were surveyed multiple times in previous concurrent monitoring rounds. It is observed that in the project cluster covered in the present round, the adoption rate was found to be low as compared to those project areas which were covered in CM round IV and V. However, the top five climate-resilient agriculture technologies which farmers have adopted are found be the same as follows: i) Use of improved seeds, ii) Cultivation by BBF method, iii) Seed treatment, iv) Foliar Spray, and v) IPM.

6.5. Awareness of the process of accessing benefits

Regarding the awareness of the steps that are involved in accessing the individual level benefits as part of the PoCRA project, respondents were found to be aware of initial steps such as registration on the DBT portal (91%). The other individual benefits found were: application for matching grant on the DBT portal (78%), verification of application by cluster assistant (73%), and approval by VCRMC committee (62%). More than 30% of respondents were aware of approval of the application by SDAO, and more than 25% were aware of the transfer of matching grants to beneficiaries. The higher percentage of the beneficiaries receiving matching grants could also be a factor for higher awareness about steps and processes involved in accessing the benefits.

Table 6.16 Awareness of steps in accessing individual benefits

Steps for accessing individual benefits (Multi response)	Project (%) Valid N=417
Registration on DBT portal	**91**
Application for matching grant on the DBT portal	**78**
Verification of application by Cluster Assistant	**73**
Approval by VCRMC committee	**62**
Spot verification by Agri Assistant	**56**
Approval of application by SDAO and provision of pre sanction	**32**

Steps for accessing individual benefits (Multi response)	Project (%) Valid N=417
Implementation of work by beneficiary	**23**
Demand by beneficiary for matching grant on submission of bills of expenditure	**24**
Post Asset Construction scrutiny by the Agriculture Assistant	**19**
Post Asset Construction scrutiny and approval by the SDAO	**11**
Transfer of matching grant to the beneficiary bank account	**30**
Not aware	**2**
Total %	100

Except for 11% of respondents in the project clusters, the rest were aware of the category of people who are provided priority in accessing individual grant benefits through PoCRA project.

Table 6.17 Awareness of beneficiary priority

Social category	Project (%) N = 393 (Multi response)
Schedule Caste potential beneficiaries	38
Schedule Tribe potential beneficiaries	36
Widows	29
Small and Marginal Farmers	54
Disabled Person	25
Landless Men and Women	41
Women	18
Others (Specify)	5
Do not Know	11
Total %	100
Valid N (multiple responses)	425

6.6. Project benefits

6.6.1. Individual

Out of 71% of respondents in project clusters, nearly 67% had applied or received individual benefits, 31% had participated in farmer field school, and 2% had accessed both the benefits. Around 96% of respondents in comparison clusters had applied or received individual benefits. Activity-wise distribution of the access to individual benefit in both project and comparison clusters are detailed below. It is observed that the highest demand under the project was for sprinklers (30%), followed by drip (27%), pipes (10%), and pumps (7%).

Table 6.18 Status of individual benefits received

Individual Benefit	Project (%)	Comparison (%)
Drip irrigation	27	28
Sprinkler irrigation	30	34
Pipes (HDPE/PVC)	10	13
Water pumps	7	5

Individual Benefit	Project (%)	Comparison (%)
NADEP Compost Unit	1	1
Vermicompost unit	1	2
Construction of Individual Farm Pond/farm pond lining	7	2
Polyhouse (Open vent)	-	-
Poly tunnels	-	-
Shade net house	4	1
Planting material in Polytunnels and Polyhouse	-	-
Production of foundation & certified seeds of climate resilient varieties	1	2
Plantation of Horticulture Crops	12	5
Plantation of agroforestry	1	1
Recharge of open dug wells	-	1
Construction of open dug well	3	7
Apiculture	0	-
Backyard poultry	1	-
Small ruminants	2	1
Inland fisheries	1	-
Sericulture	-	-
Others (specify)	1	2
None	-	2
Total	100	100
Valid N (Multiple response)	218	167

Regarding the status of application for individual benefits in project clusters, nearly 62% of respondents had received the matching grant on their bank account. It was observed that the transfer of matching grants in current round VI has improved by 2% as compared to that observed during the CM V round. All beneficiaries were found to be aware of their application status, which is a positive trend.

Table 6.19 Status of application

Status of application	Project (%)
Application for matching grant through DBT mobile application	3
Verification of application by Cluster Assistant	**2**
Approval by VCRMC committee	**8**
Spot verification by Agriculture Assistant	10
Approval and pre-sanction by SDAO	13
Work under implementation & document submission by beneficiary	1
Post work approval by SDAO	1
Transfer of matching grant to the beneficiary bank account	62
Total %	**100**
Valid N	**218**

In the following section, the feedback from those beneficiaries who had accessed individual benefits and whose application has received approval and pre-sanction from SDAO has been reviewed.

6.6.2. Drip irrigation system

Out of 58 beneficiaries who have applied for project grant for drip irrigation system, 36 have received and established irrigation system. Out of 58 beneficiaries, 28 of them (78%) used their irrigation set only when required. Six beneficiaries use the set regularly, while the remaining two use the set seasonally. The area irrigated using drip irrigation lies between 1 to 12.5 acres. On average, each of the beneficiaries reported availing drip irrigation, having 4 acres of land irrigated by drip irrigation which has increased from 3.37 acres from CM IV round and is same as that observed during CM V round. Most of the farmers used drip irrigation to irrigate Cotton (25%), Soyabean (42%), Chickpea (33%), and Sugarcane (17%). Other crops include pigeon pea, sorghum, sugarcane, black gram, green gram, sweet lime, wheat, maize, tomato, turmeric, and watermelon.

Ten beneficiaries (6 from the general category, 2 from Scheduled Tribe, 2 from nomadic tribe, and 2 from OBC category) out of 36 beneficiaries reported that they faced difficulty in accessing the benefit. Mostly the difficulty was faced in obtaining the micro-irrigation quotation/plan from the dealer (70%), geotagged photos with asset examiner (60%), providing proof of permanent water supply (40%), and providing agreement/consent in case of the common source of water supply (40%). All these project beneficiaries acknowledged benefitting from using drip irrigation.

6.6.3. Sprinkler irrigation system

A total of 66 beneficiaries, who had accessed the sprinkler irrigation system under the project were surveyed. 42 of them (63.7%) have implemented it on their fields. Except for six, all of them used sprinkler sets only on requirement. The area irrigated using sprinkler irrigation lay between 1 to 19 acres, and on average, it is around 4 acres per household undertaking sprinkler irrigation. Common crops that are irrigated using sprinkler irrigation include soybean (57%), chickpea (81%), sorghum (12%), wheat (14%), cotton (12%), pigeon pea (12%). Other crops include green gram, maize, onion, and turmeric. Like drip irrigation beneficiaries, 19 (13 farmers from general category, 3 from OBC, 1 from ST, and 1 from NT) reported difficulties in obtaining micro-irrigation plan from the dealer while accessing the project benefits.

6.6.4. Pipes

21 beneficiaries who have accessed the benefit of pipes from PoCRA were surveyed. 13 of them have received the benefit (61.9%). Most of them (10 of 13 beneficiaries) were found to be using as per the requirement. Three beneficiaries were found to be using it regularly. The size of land irrigated by pipes ranges from 1 to 12 acres with an average size of 4.5 acres as compared to 3.97 acres observed in CM IV round. Three beneficiaries (1

from general category and 2 from OBC) reported difficulties in providing proof that they have not taken benefit for pipe procurement on the same plot from any other scheme (2 beneficiaries), providing proof of permanent water supply (2 beneficiaries), and providing agreement/consent if there is a common source of water supply (2 beneficiaries).

6.6.5. Water pumps

Of the 15 beneficiaries who have accessed water pumps as a project benefit and were surveyed, 10 of them (66.7%) used water pumps only on requirement. The range of land size irrigated using water pumps goes from 1.5 to 10 acres with an average of 4 acres in each respondent's household as compared to 3.71 acres observed during the CM IV round. Of the 15 beneficiaries interviewed, 13 beneficiaries used the water pump with a power rating of 5HP, while the remaining two used pumps of 3HP power. Six beneficiaries did not know the diameter of the pipes they used. Three (21%) respondents used pipes of diameter 0.5 inch, and five (36%) used pipes of 1.5-inch diameter.

It is observed that on average, the pump is operated for 6 hours per day during the Kharif season and 7.3 hours during the Rabi season. Except for one, none of the respondent reported difficulties in accessing the benefit.

Table 6.20 Purpose of Pipes and Pumps

Purpose	Pipes Respondent (%)	Pumps Respondent (%)
Draw ground water	-	21
Lifting of water from river/canal	31	36
Transport water from well to pond	62	57
Transport water from pond to field	8	14
Other (Please specify)	23	7
Total %	100	100
Valid N	13	14

Table 6.21 Irrigation System used with Pipes and Pumps

Irrigation system	Pipes Respondent (%)	Pumps Respondent (%)
	Valid N=13	Valid N=14
Drip	31	21
Flood irrigation	62	64
Sprinkler irrigation	8	21
Furrow irrigation	8	14

More than four-fifth of each type of beneficiaries of four individual types of irrigation benefits (drip, sprinkler, pipes, and pumps) reported an increase of income and increase of agricultural production as the major benefits of adopting these. As the following table reflects an increase in income was reported more among the beneficiaries of drip and sprinkler irrigation than beneficiaries of pipes and pumps. Other major benefits reported were increased availability of water, increase in the area of cultivation in both Kharif and Rabi season, change in cropping season, and availability of water in dry spells.

The benefit accrued from the above four individual benefits are listed below:

Table 6.22 Benefits from Drip, Sprinkler, Pipes, and Pumps

Benefits	Drip (%)	Sprinkler (%)	Pipes (%)	Pumps (%)
Increase in income	100	98	92	86
Increase in production	92	91	85	71
Increased availability in water for protected irrigation	53	81	46	64
Change in cropping pattern	42	45	62	29
Availability of water during dry spells	19	24	8	21
Efficient use of water	25	33	15	36
Increase in quality of agriculture produce	14	29	-	
Increase in area of cultivation during Kharif Season	22	24	38	29
Increase in area of cultivation during Rabi Season	28	31	46	29
Increased water availability for Rabi season	6	10	-	-
Timely availability of water for irrigation	-	-	23	29
Total %	100	100	100	100
Valid N	36	42	13	14

6.6.6. Individual farm pond

16 beneficiaries who accessed the benefit of an individual farm pond were interviewed. Seven of them (43.75%) have received and implemented the benefit. Two farm ponds have inlet and outlet but no grass cultivation on its bund. According to half of the respondents, once the farm pond is filled the water, it lasts for around 90 days. All the respondents use the water as per requirement. Currently, none of the beneficiaries are using the farm pond for inland fishery activity. Except for two, the beneficiaries did not face any difficulty in accessing the benefit from PoCRA. The beneficiary has experienced an increase in income through increased agriculture production of cotton, pigeon pea, soybean, chickpea and wheat and increased availability of water for irrigation.

6.6.7. Shade net

Out of the eight shade net beneficiaries who were surveyed, four beneficiaries (50%) have received training on how to do cultivation in shade net. All the four shade net beneficiaries are primarily growing vegetables in their shade net, and one of them was also involved in horticulture activity. All four got the technical guidance on how to cultivate to achieve better productivity with the help of an agriculture assistant. Three of them were using it regularly, and one had reported that he used it seasonally. They had invested around Rs 75,000 to 13 lakhs last year. Two beneficiaries find it difficult to find skilled labour for production related activities. Two beneficiaries are able to sell their produce easily directly via haat or retail mode and in nearest town or district market. All four beneficiaries have reported having earned in the range of Rs. 35000 to Rs. 3 lakhs last year. On asking about their plan to dispose shade net after it is damaged, one beneficiary plans to burn, one plans to use dump yard, and rest two beneficiaries were not sure about their plans. All four beneficiaries did not face any difficulty in accessing the benefit from PoCRA. All of them anticipate benefits of an increase in income, production, ability to produce high-value crop, and an increase in employment opportunities for locals.

6.6.8. Agro-forestry activity

One beneficiary taking benefit of agro forestry activity under the project was interviewed. The respondent has planted teak wood under this activity through procuring the sapling from Government nursery. The beneficiary was found to have received training for the activity from Agriculture department. According to the beneficiary interviewed, he has planted teak wood on one acre of land. While the beneficiary faced difficulty of compulsion of having a soil health card in accessing the benefit and he anticipates benefits of an increase in income.

6.6.9. Horticulture plantation

Of the total 26 beneficiaries who have access to the benefit, 18 (69.23%) have received support and implemented it. Of the 18 project beneficiaries of the horticulture plantation, one third of them were found to have received training. The source of training was the department of agriculture (five beneficiaries), and one received it from progressive farmer. The main crops grown by beneficiary were custard apple (17%), Guava (50%), sweet lime (17%), and Mango (17%). The activity was practiced on one acre of land by eight beneficiaries, on nearly two acres by another eight, and the remaining two beneficiaries practiced on four acres and eight acres of land, respectively. Half of the beneficiaries sourced their saplings from government nursery and the rest from agriculture university. 15 out of 18 respondents have installed drip irrigation for efficient use of water, while the other three respodents did not find the technology useful. Seven beneficiaries have started the production from horticulture activity and except for one, all are able to sell their produce in the market. Two beneficiaries faced difficulty in the purchase of plants from Government approved nurseries. Those who are able to sell their produce have experienced increase in income.

6.6.10 Construction of Open Dug Well

Out of seven beneficiaries who have accessed the benefit from project, one beneficiary has received and implemented it. The diameter of the well is 25 feet and depth is 50 feet. The water in the well will last for 2 months after full recharge. The farmer is able to irrigate nearly 4 acres of land for about 5 times. The respondent did not face any difficulty in accessing the benefit under PoCRA and anticipated the benefit of an increase in income, increase in availability of water for protected cultivation, and availability of water during dry spells.

6.6.11. Small Ruminants

Four beneficiaries of small ruminants were surveyed, of which two are practicing the activity currently. They have undergone the training. When asked about the minimum years the activity needs to be run, one beneficiary reported 3 years while another reported 20 years. Both of them did not face any issue in accessing the benefit and are able to sell their produce in market in either rural haat or outside village. Both found the market for purchase of goats suitable and one of them was aware of responsibilities such as insurance and vaccination of ruminants that are to be followed while undertaking this activity. Both anticipate increase in income and opportunity for self employment as benefit from this activity.

6.6.12. Inland Fisheries

Two beneficiaries of inland fishery activity were surveyed, of which one is practicing the activity currently. The farmer has undergone the training for the activity, is practicing it on one acre of land and has invested about Rs. 120000 in it during the last one year. While the farmer is finding it difficult to find skilled labour for the activity, he is able to sell his produce in market easily. The farmer shared that the activity has low productivity as key challenge and has faced issue in accessing benefit such as proving that he has not accessed similar benefits from other scheme and proving availability of water source for farm pond. The farmer anticipates increase in income and improved standard of living as benefit from this activity.

6.6.13. Status of individual benefits and suggestions

Of the total 236 beneficiaries of individual activities interviewed, around 58% of beneficiaries have constructed assets at the site. Rest have either not started the activity due to financial issues or they are under construction. Almost all beneficiaries (99%) had a good experience with the application process.

Table 6.23 Feedback on application processes

Suggestions on application processes	Project (%)
	N = 218
I am satisfied with the current process	38.99

Suggestions on application processes	Project (%)
Support required in filling application through DBT application portal	11.47
Process of applying and getting benefits can be simplified	6.88
Matching grant should be increased	26.61
Documentation process in the application should be simplified	16.06

Feedback from Qualitative Enquiry:

During the qualitative survey, the participants also suggested including other activities under the individual benefit list, which are mentioned below:

1. Goat Rearing: Reinitiate goat rearing activity as there are no sources of income for landless people
2. Farm Mechanization: Most of AA and CA suggest to include farm mechanization in DBT to help the farmers in tillage operation
3. Bamboo Plantation: Bamboo plantation must be given 100% grant to boost income generation, carbon sequestration and reduce soil erosion
4. Community Farm Ponds: Need for CFPs as previous beneficiaries have experienced good results after taking this activity
5. Solar Pump: Due to uncertainty of electricity, demand for solar pumps by farmers and staff is persistent
6. Training on Shade net: Need for intensive training to farmers
7. Pipes and Pumps: Most popular amongst the farmers which is presently on hold. Many AA and CA demanded this activity to be started again.

Reasons for application rejection/delay in approval/work not initiated after receiving pre-sanction:

1. Rejection: Documentation issues, incomplete/incorrect application form, farmers availed the same benefit from other schemes, non-eligibility for a benefit were the primary reasons for rejection of the application.

2. Delay in approval/Pre-sanction: Delay due to high workload (majorly because of vacant posts) and lack of adequate IT infrastructure at Taluka Level. Some reported that the app does not work properly due to network issue. Two VCRMC reported that AA and CA did not visit their villages in COVID period.

3. Reasons for not applying: Lack of funds for initial investment, requirement of getting land records (7/12) updated from Talathi records with signature and standing crop is reason in same cases.

4. Work not initiated: Insufficient funds, other priority expenses, and seasonal aberrations causing a delay in construction are the reasons shared by farmers for not initiating the work.

5. **Measures by VCRMC for work initiation:** Motivate and guide farmers to apply and complete the work.

Feedback on DBT application

1. All stakeholders (AA, CA, AS, TAO) who were interviewed have good reviews of DBT application.
2. It is efficient in managing time and maintaining transparency in application process
3. Sometimes difficult to use while uploading documents, photographs due to poor mobile network

Feedback on project guidelines

Most officials/ stakeholders have clarity on project guidelines.

1. Timely training of staffs and communication from PMU regarding revised guidelines will help staff to maintain clarity on project implementation processes

2. Guidelines for NRM work, and evaluation of Krushi Tai may be revisited

Feedback on activities for which more cases of duplication were received

1. No cases of duplication of DBT applications were reported.

Feedback on Implementation

1. All the officials shared that the implementation is smooth
2. Activities such as poultry and goatry should be reinitiated for landless and tribal community.
3. Shortage of IT infrastructure (laptop, computer, printer) at taluka level adds to process delays.
4. Parbhani has only one subdivision and it becomes difficult for one SDAO to monitor and coordinator the PoCRA activities in entire district

Individual Activities – Specific Challenges and Suggested solutions

1. **Implementation of Horticultural Plantation**: Farmers who do not have irrigation source are non-eligible for horticulture activity since drip is compulsory for this activity.
2. **Difficulty in tracing the data of farmer on E thibak and Other Platforms**: For provisioning of project benefits, staff needs to verify beneficiary data for past three years if he/she has availed the same in any other schemes. Staff are finding it difficult to find the details from different excel sheets resulting in delay of pre-sanction. They have requested for single window for data of farmers.
3. **Application by farmers on non cultivable land (PotkhaRabi Land)**: Many times, farmers apply for activity on non-cultivable (PotkhaRabi) land (drainage line and rocky soil), therefore it is rejected during the spot verification, and it becomes difficult to explain farmer regarding this
4. **Demand for community farm pond, goat rearing have reported to be in large amount by farmers:** Need for reassessing these guidelines. If feasible, decision for resuming can be decentralized based on ground water levels and other critical factors such as employment for landless
5. **Difficulty in carrying out the daily operation cost for field visits due to no contingency amount in PoCRA at Subdivisional Level**: Feedback was given that Contingency funds may be allocated at sub divisional level to carry out vehicle maintenance as well as driver payment. Provision should be made for contingency amount like that available under Jalyukt Shivar and IWMP
6. **Difficulties faced by TAO and Agri Supervisors due to non availability of Laptop and Printers**: Due to increased responsibility of pre-sanction and spot verification need for laptop and printer is utmost necessary at Taluka level along with computer operator
7. **High workload reported by project staff remains a continuous challenge:** AAs on average have 5 villages (range 2-12) and CAs have 10 villages (range 6 -15)

6.6.14. Farmer Field Schools

Farmer Field School (FFS) is an important component being implemented under PoCRA. The two key stakeholders in FFS are the host farmers and guest farmers. Host farmers are the ones who host the farmer field school on their agricultural land. Guest farmers are the one who attends the FFS sessions to learn through demonstrations of new climate-resilient agriculture technologies promoted under PoCRA. This section presents the findings on FFS in the current concurrent monitoring round survey from the PoCRA villages. No beneficiaries from comparison villages have reported undergoing FFS or similar training sessions.

Review of success of FFS based on feedback from surveyed beneficiaries:

A total of 106 farmers were surveyed from project villages which include 29 host farmers and 77 guest farmers. One host and six guest farmers were also interviewed in comparison villages. Nearly 5% of guest farmers in project area participated in 2018, 14% in 2019, and the rest 80% in 2020. In comparison area, two guest farmers participated in 2018 and remaining four in 2020. Looking at the cropping season-wise distribution, 74% of the guest farmers participated during Kharif and the rest 26% during Rabi. In comparison, all six guests participated during Kharif season.

Table 6.24 Crop wise host farmer demonstration and guest farmer participation

Crop	Host farmer demonstration (%)	Guest farmer participation (%)
Cotton	20.83	28.57
Maize	6.25	3.9
Soybean	22.92	42.86
Turmeric	2.08	0
Rabbi Jowar	4.17	2.6
Chick Pea	18.75	15.58
Onion	8.33	0
Cotton + Green Gram	4.17	1.3
Cotton + Black Gram	0	0
Cotton + Pigeon Pea	0	0
Soybean + Pigeon Pea	8.33	3.9
Bajara + Pigeon Pea	0	0
Others(specify)	4.17	1.3
Total %	100	100
Total N	**29**	**77**

Among the 29 host farmers, 14 farmers (48%) were motivated by agriculture assistants, 9 farmers (31%) were motivated by FFS facilitators, five farmers (17%) were motivated by VCRMC, and one was motivated by agriculture department staff. The host farmer in comparison area was motivated by agriculture department staff. Regarding honorarium, 9 (31%) of them have received it. The honorarium for 10% of host farmers is in the process, while 59% of host farmers shared that they have not received it. The host farmer in comparison area has received the honorarium. 27 (93%) host farmers find differences in the quality/cultivation of produce from demo and control plot. 25 host farmers see higher yield and observe less pest attack, 22 farmers noted more climate resilience to weather, and 11 host farmers reported less tillage.

The distribution of reasons cited by both host and guest farmers for participating in the FFS in project areas were as follows:

Table 6.25 Reason for FFS participation

Reasons for participation	FFS participants (%)
	Valid N = 106 (Multiple reason)
Was interested to learn new technologies related to agriculture	77
To increase production and income	76

Reasons for participation	FFS participants (%)
To reduce cost of production	80
To learn how to apply fertilizers and pesticides more effectively	65
To utilize water more effectively	38
To save their crop from climate variation (high temperature /low rainfall/very high intensity rainfall etc)	31
No specific reason, was suggested by my friends/family	5
Due to extra income provided for participating in FFS as host farmer	1

On asking if they have attended all technology sessions conducted under PoCRA FFS, 74% of FFS farmers responded positively. Rest 18% FFS farmers could attend on an average 3 to 4 FFS sessions and cited the following reasons for not being able to attend all sessions. Most common reason for not attending FFS was the priority of other personal work.

Table 6.26 Reasons for not attending all sessions

Reason for not attending all sessions	FFS participants (%)
	N = 28
Did not find the sessions useful	4
Had to skip the session due to personal work	43
Had to skip the session due to work in own field	21
Was not aware about the session's timings	14
Found the new technology difficult to understand	4
Total %	100

It was observed that the time of the next FFS session was informed to nearly 51% through SMS or WhatsApp message, 23% were informed by FFS facilitator during FFS session and the rest 26% were informed in person by other project staff such as cluster assistant, agriculture assistant, and Krushi Tai. Nearly 79% of the participants find the timing of the FFS session convenient. 70% of all the sample guest farmers have reported that their queries were satisfactorily answered by FFS host farmers. 43% of all FFS participants, including host and guest farmers, have requested training on topics apart from what is covered under FFS. Some of the key topics on which they expect training are orchard plantation, goatry, certified seeds, and the marketing of agri produce. 92% (97 of 106) of all FFS participants including host and guest farmers think that they have benefitted from attending the FFS session.

Table 6.27 Technology demonstrated in FFS

Technology demonstrated in FFS	Whether received training on technology through FFS?		Whether adopted technology after participating in FFS session		
	Yes	No	Yes, after participating in PoCRA FFS	Yes, but before participating in PoCRA FFS	No
Preparation of pesticide formulations & spraying	90	10	58	33	9
Foliar application of 2% DAP	90	10	51	35	14
Spraying techniques with safety measures	92	8	45	47	8
Seed treatment with bio-fertilizers	86	14	58	28	13
Bird perches (10/acre)	48	52	27	20	53
Irrigation by Drip/Sprinkler	80	20	41	32	27
Integrated weed management	80	20	46	44	9
Crop residue management	85	15	42	49	8
Foliar Spray of micronutrients	75	25	43	35	22
Seed treatment with fungicides	69	31	40	30	30
Installation of pheromone traps (4-5/ha)	49	51	30	13	57
Sticky traps (10/acre)	51	49	31	16	53
Nipping of apical bud	58	42	27	32	41
Application of basal dose of fertilizers	77	23	50	30	20
Thinning & Gap filling	57	43	30	21	49
Preparation and application of Dashaparni extract	59	41	46	14	40
Preparation of Broad Bed Furrow	66	34	36	25	39
Foliar application of Potassium Nitrate	58	42	37	19	44
Preparation of neem based formulations	69	31	50	23	27
Sowing of border crops/Trap crops	54	46	33	22	45
Foliar application of 2% Urea	75	25	53	27	20
Application of Soil amendments	56	44	30	29	41
Draining of excess water	68	32	40	34	26

Technology demonstrated in FFS	Whether received training on technology through FFS?		Whether adopted technology after participating in FFS session		
	Yes	No	Yes, after participating in PoCRA FFS	Yes, but before participating in PoCRA FFS	No
Identification & removal of affected rosette flowers	49	51	29	16	55
Intercultural operation	70	30	43	33	24
Opening of alternate furrow / dead furrow	46	54	18	15	67
Sowing on Broad Bed Furrow (with Planter)	42	58	21	13	66
Sowing across the slope	45	55	26	16	58
Sowing of refugee in cotton	44	56	29	13	58
Use Trichocards / Crysopa (4000 eggs/acre)	33	67	16	16	68
Use of climate resilient varieties	81	19	56	28	16
Intercropping	82	18	37	52	11
Zero- tillage	57	43	21	26	53
Use of green manure	63	37	38	30	32
Soil amendments	58	42	30	27	42
Protective cultivation	63	37	39	30	31

Feedback on BBF Technology: Out of 71 respondents using BBF technology, 62 (87%) of respondents found it to be useful during excessive rain last year. The respondents noted that it helped in the drainage of excess water and helped in root development by avoiding water stagnation.

Of the total FFS participants, including host and guest farmers 66% found that the technologies learned through farmer field school demonstration sessions have been very helpful in reducing the impact of climate vulnerability (less rainfall, high temperature). Rest 34% found the technologies helpful to some extent. All the participants reported that the information provided by the FFS facilitator was useful. Nearly 94% of the FFS participants, including host and guest farmers, are willing to continue using the technologies. 6% of respondents reported that they do not find the technologies useful. The technologies are expensive and difficult to apply in fields.

The distribution of the percentage of FFS respondents, including both host and guest farmers, on the location of selling their agricultural produce is as follows:

Table 6.28 Place of selling agricultural produce

Place of selling agriculture produce	FFS respondents (%)
	Valid N = 106 (Mutiple response)
Directly through Haat or via retail mode	40
Local dealers in village	6
To other traders outside the village	12
In the nearest town or district market	21
Through Farmer Producer Companies	4
Nearest APMC market	29
Government Procurement Agencies (NAFED / SFAC etc)	1
Directly to processer	2
Directly collected from home	1

The mean distance the FFS respondents travel for selling their produce is around 27 km. When asked about the form in which they sell their agricultural produce, 95% always sell it separately, and the rest 5% sometimes prefer to sell separately and sometimes through aggregation. 68% of respondents reported that they store their crops after harvest and 81% of respondents reported that they have adequate space to store their crops.

Feedback from Qualitative Enquiry:

Feedback on Quality and Effectiveness of FFS Sessions

1. Majority coordinators reported quality of session to be good, overall awareness of FFS and adoption of technologies has improved specially in preparing formulations, sticky traps and use of BBF Technology due to practical trainings given to them
2. Effective strategies: Follow up data filled by FFS facilitator in App as well as observing and instructing the Facilitator during the FFS was found to be good strategy for improving quality. Meeting every fortnight also helps in quality. Snacks and refreshments during sessions was also found useful
3. Common challenges: a) Mobilization issues due to Covid b) Uninterested in session because of Payment dues of FFS c) Time management in the Kharif season as farmer is busy

Feedback on Skills of FFS Facilitators

1. Coordinators reported that they themselves check and observe the facilitators and guide them in case of problem. Trainers are accordingly supported by training in KVKs, webinars or through WhatsApp or in monthly Saturday meetings
2. **Steps to improve facilitator skills** : Trainings through retired staff of agricultural department as well as follow up of the observations entered during the sessions in the app

Common indicators to review FFS Facilitators' work by Coordinators: their mobilization skills, ability, punctuality in FFS sessions, accuracy in the observations noted, ability of sharing information, mobilizing the farmer to participate, then adopt the technology.

- Feedback on FFS Application
- Most of the facilitators have not faced any concern with the FFS App
- Some FFS Facilitators also shared that entering information on the App during FFS session becomes a little problematic. Because of the constant use of phone during the FFS session, sometimes farmers think that the facilitator is not sincere in conducting the FFS and using the phone in the middle of the session.
- Networks issues and related problems in using presentations from the app were also cited by few FFS facilitators

Participation of Women Farmers in FFS

- Women usually have no time because they are already busy in their domestic work, moreover some plots are distant from the village
- Eight Facilitators reported conducting the FFS exclusively for the women
- Some women prefer to come with their husbands, and this is not always possible causing less attendance.
- There is a need to sensitize men so that they support women in joining the FFS Sessions
- The participation of women is tried to be increased with the help of Krushi Tai and the SHG members in the village as reported by many SDAOs

Reducing Production Cost of farmers

- Organic methods of farming including BBF as well as Bird Perches, use of neem extract and Dashparni ark was found more useful
- Some technologies include use of compost manure, neem extract use along with seed treatment
- Suggestion for using the biological pesticides as well information regarding not using costly pesticides also done by facilitators

FFS Monitoring

- All coordinators reported having regular meetings, twice a month, with SDAO and FFS Facilitator to review the work and keep track of progress
- The usual days are 1st and 3rd Saturday, except in some cases where meetings are held on Thursday/Friday
- All coordinators shared that they do not face any problem while organizing these meetings

6.6.15. Community Benefits

6.6.16 Natural Resource Management (NRM) Works

This sub-section presents the findings from the concurrent monitoring of the NRM community interventions based on the quantitative interviews with PoCRA NRM intervention beneficiaries, beneficiaries of similar interventions in the comparison area, and from the qualitative interviews with key project stakeholders. The total sample of beneficiaries of community based NRM assets in both project and in comparison villages is 50 respondents. However, to maintain the project to comparison sample ratio of 2:1, we randomly sampled 25 samples from the comparison set and analyzed them. All the assets constructed in project villages were found on the site. Nearly all the assets in project and comparison villages were already constructed. The distribution of community/ NRM works beneficiaries interviewed in project and comparison clusters are as follows:

Table 6.29 Community NRM works done

Community/ NRM works	Project (%)	Comparison (%)
	N = 50	**N = 25**
Agro forestry	-	-
Continuous Contour trenches	-	-
Deep Continuous Contour trenches (CCT)	6	16
Construction of Loose bolder Structures	-	-
Construction of Earthen Nala Bunds	20	36
Construction of Cement Nala Bunds	-	4
Gabian Structure	-	12
Desilting of old water storage structure	-	-
Compartment /graded bunding	74	32

Community/ NRM works	Project (%)	Comparison (%)
Common land (e- class) community farm pond	-	-

When asked whether the planning for the development of community assets is done according to the water balance, nearly three-fourth of the respondents in control and 94% in project clusters said yes, around 2% in project and 16% in comparison responded no and nearly 4% from project and 12% from control clusters were not aware of the development planning.

80% of the respondents in project villages and 64% in the comparison villages shared that social audit has been done in their village. The distribution of rating of the quality of constructed assets reported by the respondents in both project and comparison clusters is depicted in below table, which shows satisfaction on the quality of assets was slightly better in project areas than comparison areas.

Table 6.30 Feedback on the quality of assets

Feedback on quality of assets	Project (%)	Comparison (%)
	N = 50	N = 25
Very unsatisfactory	14	4.2
Somewhat unsatisfactory	6	-
Neither satisfactory, nor satisfactory	-	-
Somewhat satisfactory	48	58
Very Satisfactory	32	37.5
Total %	100	100

Based on the feedback from the respondents, the distribution of benefits accrued through the constructed community NRM works in both project and comparison clusters is as follows:

Table 6.31 Benefits from NRM works

Benefits accrued from NRM works	Project (%)	Comparison (%)
	Valid N = 50	Valid N = 25
Increased availability in water for protective irrigation	78	88
Increase in yield/ production	76	76
Change in cropping pattern	40	48
Availability of water during dry spells	28	28
Increase in area of cultivation during Kharif Season	34	24
Increase in area of cultivation during Rabi Season	34	32
Increase in income	32	32
Have not benefitted till now but may benefit in future	-	4
Do not think will benefit from this NRM work	2	-
Total	100	100

When asked if they have experienced an increase in groundwater level near their farm after construction of these NRM assets, 86% (43 of 50 respondents) in project clusters and 88% (22 of 25 respondents) in comparison clusters responded positively. Rest in both project and comparison clusters are hopeful that it may increase in future. When the respondents in the project clusters were asked about their willingness to be

involved or involvement in the maintenance of these assets post construction, 94% (47 of 50 respondents) responded positively. They would like to contribute to the maintenance activity of NRM works in the following ways:

Table 6.32 Maintenance of NRM works

Maintenance of NRM works	Project (%)
	N=47
Willing to be part of the structure maintenance committee	12.7
Willing to pay for maintenance of structure	63.8
Willing to provide labour support from self or family for maintenance of the structure	23.4

6.6.17. Community Farm Pond (CFP)

Similar to the feedback on NRM assets, feedback was taken from beneficiaries of community farm ponds. The beneficiary sample for community farm ponds includes 18 beneficiaries from the project area. In project villages, it is observed that generally, 3 to 10 members come together to apply for CFPs. In 94% of the project cases, the asset was found on site. None of the farm pond has an inlet-outlet, but had a lining.

Status of application: All the 18 beneficiaries shared that they have received the matching grant on their bank account.

Motivation for applying and application process: Following are the sources of motivation and support for the application process for the beneficiaries in project clusters.

Table 6.33 Source of motivation and support for the application process

Source/ Support	Motivation for application (%)	Application process (%)
	Valid N =18	N = 34
Self	72	33
Family members of the household	39	33
VCRMC members	39	-
Friends or neighbours	39	22
Project staff (including cluster assistant, agriculture assistant, FFS facilitator)	28	28
Gram panchayat members	6	11

Source of funds: *The various sources of funds for 18 CFP beneficiary respondents in project clusters were found to be as follows:*

Table 6.34 Source of fund

Source of fund	Project (%)
	Valid N = 18
Used own funds	89

Source of fund	Project (%)
	Valid N = 18
Took loan from friends/extended family members/neighbours	28
Took loan from money lender	11
Took loan from bank/micro finance companies	39
Took loan from SHG	11

Dimensions of CFP and water availability: The length, width, and height of CFP in the project cluster ranged from 32 to 100 ft, 32 to 100 ft, and 3 to 47 ft. The average duration for which water lasts in the CFP once filled is 157 days.

CFP features and benefits: Nearly 89% of CFP beneficiary uses the asset as per the requirement. Of the 18 CFPs, farm pond display boards are available at 10 sites. All beneficiaries shared that their CFPs do not have an inlet/outlet, and 61% (11 of 18) do not have grass cultivation on their farm pond bunds. All CFPs have a lining on them. A total of 77 acres of land is irrigated using water from these 18 CFPs in the project area. The main source of water for these CFPs is an open dug well. Other sources of water are river, canal, and lake. Almost in all the CFPs, water is filled using a motor pump and pipes. 72% of CFP beneficiaries did not face any issues in accessing the benefit from PoCRA.

Feedback from Qualitative Enquiry on Community Activities

Community Activities – Specific Challenges and Solutions

- **Scope for implementation of community NRM works at a large scale:**
  - Ensuring presence of functional VCRMCs
  - Micro planning and community works should be planned or priority basis for second and third phase villages
  - The site selection and NRM training for the project staff needs to be given on priority
  - Need to expedite implementation of community works in Phase 1 villages
  - Workshop with key stakeholders should be conducted to identity the key impediments and practical solutions and realistic times should be set for their implementation
- **Limited understanding of VCRMC committees and project staff of their role in planning of community work in the village**
  - Capacity building of VCRMCs members must be increased regarding roles related to implementing community activities through exposure visits to the model watershed villages for better understanding and creating.
  - Training related to scientific drainage line surveys and DPR preparation based on Net planning and need based NRM interventions must be given to staff.
- **Awareness related to efficient use of CPR land and E class land**
  - The project may require investments into behaviour change for understanding the benefits of community work on E class and CPR land so that the land can be used efficiently for the purpose of community tank or water harvesting structure.

- **Limited awareness amongst farmers about the benefits of NRM structure**
  - Awareness needs to be created among farmers about the benefits of NRM assets – both at community and individual level through workshop and exposure visits
  - VCRMC meetings and Gramsabhas must take the lead in creating awareness

Table 6.35 Benefits from CFPs

Benefits accrued from CFPs	Project (%)
	N = 18
Increase in income	94
Increase in production	89
Increased availability in water for protective irrigation	61
Change in cropping pattern	61
Availability of water during dry spells	28
Increase in area of cultivation during Kharif Season	44
Increase in area of cultivation during Rabi Season	55
Increased water availability for Rabi season	28

6.6.18. Project Supported FPC Beneficiaries

One of the key components of PoCRA is to strengthen the existing farmer producer organizations or companies in their entrepreneurial ventures by providing them with financial support. This is aimed to strengthen the post-harvest activities and value chain of the major crops and to strengthen the supply chain for climate-resilient crop varieties in the project area. The FPCs that have applied to receive support or have received support through PoCRA were sampled from each district, and feedback of their members was taken to understand the current activities taken by the by FPCs and get feedback on the support received through PoCRA till now.

Two FPCs who have received/applied for support from PoCRA were randomly selected from each district (Except the Parbhani district – since currently there is no FPC supported in Parbhani district by PoCRA). A total of 16 project supported FPCs were covered, and feedback from a total of 46 FPC respondents (21 FPC directors and 25 members) was taken as part of the CM VI round. One FPC in comparison area was covered. The year of establishment of FPCs is as follows: 2014(2), 2015(1), 2016(1), 2018(5), 2019(4), 2020(2), and 2021(2). Almost all respondents shared that their FPC has both male and female members, and agreed that their FPC is operational. During the survey, 72% of 25 members shared that they always participate in general body meetings of their FPCs, 5% sometimes attend it, and the rest 2% rarely attend the meeting. Nearly the same proportion of members participate in the decision-making process of their FPCs. Around 48% of 25 members reported that they get priority for accessing storage facility of their FPC, for 12% of them the priority is not applicable, and the rest 40% shared that they do not get priority access. Nearly 35% of all 46 FPC respondents, including directors and members, have received training on especially custom hiring centres, farm mechanization, seed production, and crop management. The activities which the surveyed FPCs undertake are as follows:

Table 6.36 Activities undertaken in FPCs

Activities undertaken in FPCs	**FPC respondent (%)**
	Valid N = 37
Aggregation of produce	81
Providing agricultural inputs like seeds, fertilizers	57

Activities undertaken in FPCs	FPC respondent (%)
Providing access to market for produce	43
Value addition of agriculture produce like sorting, grading etc.	14
Provide training to farmers on best agricultural practices	14

Some of the key agribusiness activities in which the surveyed FPCs are involved are custom hiring centres, oil extraction units, and guide farmers. Facilities/services which members of sampled FPCs receive are as follows:

Facilities/ Services provided by FPCs	Respondent (%)
	Valid N = 39
Marketing support in selling my agriculture produce	64
Purchasing seeds through FPC	49
Purchasing chemicals fertilizers through FPC	38
Grading and sorting of my agriculture produce with support of FPC	13
Converting my agriculture produce to value added products (E.g Converting into soybean-to-soybean oil)	15
Getting access to equipment/tools for agriculture	54
Access to godown facility	13

67% of the total FPC respondents have sold their agriculture produce through their respective FPCs. The most common crops sold through FPCs are Soybean, Chickpea, and Cotton. 91% of all respondents were aware of business plans prepared by their company for financial support to be received from PoCRA. All the 16 surveyed FPCs have received financial support from PoCRA. 26% of FPC respondents shared that they faced difficulty in accessing the benefit through PoCRA, which are mentioned in the below table:

Table 6.37 Difficulty faced in accessing benefit through PoCRA

Difficulty faced	Respondent (%)
	Valid N= 34
Difficulty in receiving guidance in accessing project benefits	53
Difficulty in preparation of business plan	38
Difficulty in arranging the required documents for application	29
Difficulty in getting pre-sanction for the application	12
Difficulty in getting bank loan	50
Total (%)	100

Challenges faced by FPOs

- Getting bank loans is key challenge reported by many FPOs
- Condition of Non Agriculture (NA) plot for mortgage as well as NA land requirement for setting up a godown was a major challenge faced by the FPCs

Experience with application process and review

- Majority are satisfied with the support received for grant application
- Most of them acknowledged support from Agriculture Assistant, Cluster Assistant as well as Agribusiness specialist of that district
- Some received support for capacity building, machinery procurement, market linkage from PoCRA

Strategy for arranging the balance funds

- Most of FPOs arrange funds through member contribution. Few avail from banks and other sources.
- Strategy adopted was to utilize profit as a balance fund and repayment of loans.
- Respondents reported that the requirements set by the banks were stringent and often unattainable and hence they could not get access to the loans. The documentation requirements and initial banking costs were reported to be one of the hurdles faced.

Suggestions/Support expected from PoCRA

- Vision and Mission building exercise for BOD and staff
- Production planning, demand estimation and loan repayments need to be automated
- Infrastructural support to help in building warehouses, cold storage and godowns

6.6.19. Project Supported SHG Beneficiaries

Another key component of PoCRA is to strengthen the existing self-help groups in their entrepreneurial ventures by providing them with financial support. This is aimed to strengthen the post-harvest activities and value chain of the major crops and to strengthen the supply chain for the climate-resilient crop varieties in the project area. The SHGs that have applied to receive support or have received support through PoCRA were sampled from each district, and feedback of their members was taken to understand the current activities undertaken by the SHGs, and get feedback on the support received through PoCRA till now. One SHG who has received/applied for support from PoCRA was randomly selected from each district. A total of 8 SHGs were covered, and feedback from a total of 18 SHG respondents (9 SHG presidents and 9 members) was taken as part of the CM VI round. The year of establishment of SHGs is as follows: 2012(2), 2017(1), 2018(4), and 2020(1). 83% of respondents shared that their SHG has both male and female members.

Nearly 44% of all 18 SHG respondents, including president and members, have received training on especially custom hiring centres, farm mechanization, seed production, and crop management. Also, 75% of the respondents have also received training on business establishment through the agriculture department. 83% (15 of 18) of respondents shared that they save regularly on a monthly basis, while the rest reported that they are not currently saving regularly. The average monthly saving is approximately Rs. 450. 50% of respondents noted that their SHGs are involved in income generation agribusiness activities such as custom hiring centres. Facilities/services which members of sampled FPCs receive are as follows:

Facilities/ Services provided by SHGs	Respondent (%)
	N = 18
Marketing support in selling my agriculture produce	35
Purchasing seeds through SHG	12
Purchasing chemicals fertilizers through SHG	24
Grading and sorting of my agriculture produce with support of SHG	12
Converting my agriculture produce to value added products (e.g. Converting into soybean-to-soybean oil)	6

Facilities/ Services provided by SHGs	Respondent (%)
	N = 18
Getting access to equipment/tools for agriculture	94
Total (%)	100

All the 8 surveyed SHGs have received financial support from PoCRA. 50% of SHG respondents shared that they faced difficulty in accessing benefits due to insufficient guidance in preparation of business plan and arranging documents.

FPOs and SHGs: Specific Challenges and Solutions

- **Limited Awareness about Risk Management.**
  - FPO doesn't have a clear understanding about risks related to its business and operations. FPO realized importance of identification of risks, their impact on organization and strategies to mitigate them
  - Implementation of risk management matrix and training through project may reduce chances of risks involved
  - Primary business of FPO is agriculture or allied activities, and hence risk analysis and mitigation plan needs to be in place
- **Limited vision for Long Term Business Strategies and Operational Plans**
  - Capacity of the Governing board needs to be developed in terms of understanding their roles and responsibilities, businesses, finances, production, marketing and other operational issues
  - Benchmark of efficiency for each business process needs to be defined and milestone-based approach needs to be followed by staff and management team

6.6.20. Support to FPCs/ SHGs for undertaking Agribusiness

21 FPC directors and 9 SHG presidents have reported that their groups were involved in agribusiness activities. The year of receiving the PoCRA grants is as follow:

Table 6.38 Year of grant for agribusiness

Year of grant	FPC (N=21)	SHG (N=9)
2018-2019	2	-
2019-2020	14	5
2020-2021	5	4

The agribusiness activity-wise percentage of respondents who reported the PoCRA support to their respective FPCs and SHGs is as follows:

Table 6.39 Agribusiness activity-wise support from PoCRA

Agribusiness activity	FPC Respondent (%)	SHG Respondent (%)
	Valid N = 42	Valid N = 18
Custom Hiring Centre	81	89
Godown	21	6

Agribusiness activity	FPC Respondent (%)	SHG Respondent (%)
	Valid N = 42	Valid N = 18
Seed processing unit	-	5
Goat breeding centre	-	11
Oil extraction Unit	7	-
Flour mill	2	-
Total %	100	100

Finance for agribusiness activities: The status of funding for agribusiness activities as reported by the directors of project supported FPCs, and the presidents of project supported SHGs is detailed below.

Table 6.40 Status of funding for undertaking agribusiness activities

Finance head	FPC Range of Amount (Approx.)	SHG Range of Amount (Approx.)
	N = 21	N = 9
Total value of AB project	Rs. 1.9 to Rs. 60 lakhs	Rs. 1.5 lakhs to Rs. 20 lakhs
Bank loan	Rs 8 lakhs to 40 lakhs	None
Self-capital	Rs. 1.98 to 20 lakhs	Rs. 6 to 19.87 lakhs
PoCRA grant	Rs. 9 lakhs to 38 lakhs	Rs. 6.57 lakhs to 12 lakhs

In the case of bank loans, the directors of the project supported FPC respondents shared that the loan installments were being repaid regularly.

6.6.21. Custom Hiring Centre (CHC)

The type of machines available in CHCs of the PoCRA supported FPCs and SHGs as reported by the respondents are as follows:

Table 6.41 Type of machines available in PoCRA supported FPCs and SHGs

Type of machine available in CHC	FPC Respondent (%)	SHG Respondent (%)
	Valid N = 37	Valid N = 16
Tractor large more than 35 HP	87	81
Tractor small up to 35 HP	3	31
Harrow	32	12
Plough	84	100
Multicrop Thresher (30 HP and above)	35	69

Type of machine available in CHC	FPC Respondent (%)	SHG Respondent (%)
	Valid N = 37	Valid N = 16
Multicrop Thresher (Below 30 HP)	16	-
Power weeder	3	-
Cultivator -9 tyne	43	69
Cultivator -5 tyne	11	19
Power Tiller	27	6
Reaper	16	12
Trailor (above 1 brass)	62	6
Trailor (below 1 brass)	-	12
Rotavator	81	94
Blower	13	25
Ridger	5	13
Sillage baler	16	-
Chaff cutter	22	-
Seed drill (BBF) – 9 tyne	51	63
Seed drill (BBF) – 4 tyne	-	13
Combined harvestor	5	-
Turmeric harvestor	3	-
V Pass	24	-
Bed Maker	16	-
Land leveler	11	6
BBF Machine	11	13

All the respondents of FPCs and SHGs shared that the members were provided machines from CHC at lower rates. The various features of CHC services are as follows:

Table 6.42 Features of CHCs of PoCRA supported FPCs and SHGs

Features of CHCs	FPC Respondents (%)	SHG Respondents (%)
Area under CHC service		
	Valid N = 17	Valid N = 8
Within 50 hectares	12	38

Features of CHCs	FPC Respondents (%)	SHG Respondents (%)
50 to 100 hectares	29	50
More than 100 hectares	53	12
Service not provided	6	-
Farmers Serviced		
0 to 50	5	37
51 to 100	24	13
101 to 150	47	13
151 and above	24	37
People trained for operating equipment		
0 Men	-	13
1 to 5 Men	100	62
6 and above Men	-	25
0 women	-	-
1 to 5 women	-	-
6 and above women	-	-
Perceived Benefits		
	N = 37 (Multiple Response)	N = 16 (Multiple Response)
Machines available at discounted rates	92	94
Reduction in cost of cultivation	68	56
Solution to labour issues	38	44
Increase in rural employment	19	44
Difficulty faced by farmers in accessing CHC		
	N = 24 (Multiple Response)	N = 15 (Multiple Response)
Hiring Rates very high	33	40
Machines not made available to all	71	67
Cannot operate the machines	33	40
Skilled labour not available	17	47
Very high demand leads to shortage of availability	12	53

Features of CHCs	FPC Respondents (%)	SHG Respondents (%)
Cost of maintenance very high	54	27
Some machines are non-operational	12	-

According to the respondents, all villagers were aware of the CHC facility and were able to access the same. The display board for CHC was found to be available in all the villages. Details of physical verification and operational condition of the equipments in CHCs visited by the investigators are presented in annexure on page 130.

6.6.22. Godown (Warehouse)

7 FPC directors have reported the presence of godown under PoCRA support. The details of the various features of the godown are as follows:

Table 6.43 Features of Godown (Warehouse) of PoCRA supported FPCs and SHGs

Features of Godown/ Warehouse	FPC Respondents
	N =7
Total Capacity in MT	
500	5
1300	1
5000	1
Capacity utilized in MT	
200	5
1300	1
2000	1
Purpose of godown	
Seed processing and storage	6
Grain processing and Storage	1
Crops stored	
Soybean	4
Tur	3
Gram	3
Wheat	3
Maize	1
Cotton	2

Features of Godown/ Warehouse	FPC Respondents
	N =7
Total Capacity in MT	
Farmer benefitted	
0 to 50	1
51 to 100	2
151 and above	4
Rate for storage (INR/kg)	
10	7
Discount for members	
	N = 10
10% lower rate	9
10-20% lower rate	1
Perceived benefits of warehouse	
Storage available at discounted rates	8
Post-Harvest Losses are reduced	8
Better price to the produce	2
Perceived difficulties in accessing warehouse	
Hiring Rates very high	3
Storage not made available to all members	7
Shortage of storage capacity	2

According to the respondents, all villagers were aware of the warehouse facility, and half of them were able to access the same. The display board for the warehouse was available in all the villages. One warehouse did not have insurance. Details of physical verification and operation condition of the godowns visited by the investigators are presented in annexure on page 130.

6.7. Democratic governance

75% (124 of 164) of respondents in project clusters were aware of the village level micro-planning (as part of PoCRA project) that was conducted in their village to decide what watershed management activities should be done in their village. 81% (101 of 124) of them had participated in the development of their village's micro-plans developed as part of PoCRA project. 46% (46 of 101) of the respondents in the project village found the water budgeting application used in the micro-planning process useful, 50% (50 of 101) of the respondents found it very useful, while the rest did not find it useful. 73% (124 of 164) respondents in project villages feel that VCRMC represents all sections of the society, 12% (20 of 164) say it is not representative, and the rest 12% do not have a say.

6.8. Access to other government schemes

The distribution of access to other government schemes in both project and comparison clusters is presented below. Beneficiaries from both project and comparison are particularly related to agriculture credit and insurance schemes. Pradhan Mantri Fasal Bima Yojna (88% in project and 80% in comparison), followed by Kisan Samman Yojana (29% in project and 28% in comparison), were the most popular among all Government schemes. The awareness and accessibility among the farmers to other Government schemes should be increased for better percolation of benefits.

Table 6.44 Access to other government schemes in project and comparison

Access to other government schemes	Project (%)	Comparison (%)
	N = 378	N = 200
Solar Water Pump Scheme	4	4
Pradhan Mantri Fasal Bima Yojna	88	80
Jalayukt Shivar Abhiyaan	2	8
MGNREGA	23	38
Pradhan Mantri Kisan SAMPADA Yojana	14	12
Pradhan Mantri Krushi Sinchai Yojana (PMKSY)	3	6
National food security mission	11	7
KIsan Samman Yojana	29	28
Total (%)	100	100

6.9. Project knowledge

When asked about their general awareness about the project through various mediums, 77% of respondents in project clusters used Facebook page/Youtube channels of PoCRA, 79% respondents were aware of project display boards, and 20% of them were aware of the VCRMC board. Nearly 6% of respondents were aware of the board presenting the water balance activity of the village. Also, around 27% of respondents were aware of the project through participation in exposure visits and training under PoCRA. Thus, it reflects the importance of social/digital media as a medium to receive knowledge about PoCRA project.

Table 6.45 Medium through which knowledge of project received

Knowledge on project	Project (%)
	N = 425
Use of Facebook/youtube	77
Participation in an exposure visit	30
Attended training from PoCRA	27
Board detailing activities under the project	10

Knowledge on project	Project (%)
	N = 425
Board presenting the water balance activity details of your village	6
Project information board	79
VCRMC Board	20

6.10. Project satisfaction

As the following table reflects, high satisfaction was observed when asked about various activities undertaken under PoCRA project. Apart from village micro-plan activity, in all other activities, majority of the respondents were found to be satisfied. More than four-fifth of the total respondents were either somewhat satisfied or very much satisfied. Dissatisfaction (very unsatisfactory or somewhat unsatisfactory) was reported in one-tenth or less than one-tenth cases.

Table 6.46 Feedback on project satisfaction

Concerns	Very unsatisfactory	Somewhat unsatisfactory	Neither satisfactory or unsatisfactory	Somewhat satisfactory	Very Satisfactory
Village micro-plan rating (N = 425)	3	3	1	58	35
Process of accessing benefits (N =450)	3	2	1	55	39
Work of VCRMC (N = 425)	5	1	1	40	53
Support from Project staff (N = 450)	9	2	3	51	35
Knowledge of FFS facilitator (N = 318)	4	2	2	55	37
Work of Krushi Tai (N = 425)	4	1	1	40	54

6.11. Feedback from Qualitative Enquiry

6.11.1. VCRMC

The key agenda of the meetings is to discuss and approve to the application of the farmers. The meeting are also conducted to form the VCRMC committee as the newly elected Panchayat body is formed in many villages.

- **Frequency of meetings:** The meeting dates are decided in the previous meeting of VCRMC. Meetings are held once a month, mainly for scrutiny and approvals to the applications.
- **Documentation:** Since some VCRMCs were newly formed, they had less awareness about PoCRA project, and documentation is independently maintained by the AA. Proceedings of the meeting were mostly maintained by AA/CA in most VCRMCs. The newly formed VCRMCs were found to be learning the documentation process.

- **Resolution of complaints:** All VCRMC mentioned they receive all complaints orally and try to resolve them based on their personal rapport with farmer.
- **Financial transactions**: Except for two out of 29 VCRMCs, rest have not done any financial transactions because either they have not received any funds or the commitees were in the process of opening new bank accounts with new signatory. Two VCRMCs mentioned that the financial transactions are being done from the funds which was received in last installment to old VCRMC.
- **Prioritization criteria:** All VCRMCs are aware and convinced with the current prioritization criteria. However, few have expressed their concerns related to OBC farmers and the landless who are not included in the priority list.
- **Capacity building training sessions attended**: Only one VCRMC had undergone an initial training that introduced them to different components of PoCRA and the role of VCRMC. It was also found that 10 members of one VCRMC attended the training.
- **Participation of women:** Women respondents positively responded to their involvement and participation in the decision-making process and work of VCRMC.
- **Reasons for delay in approval to individual grant application:** Uploading of the incorrect documents of farmers and delayed spot verification by AA results in the delay in approval to individual grant application.
- **Efforts for making village climate-resilient:** The plantation drive was the most common response from the member when asked about the efforts for making villages climate-resilient. Some VCRMCs mentioned that minimal use of plastic and ban on axe is also adopted in their villages.
- **Motivating farmers receiving presanctions but not starting work:** Farmers can be supported through awareness, guidance, connecting them with financial stakeholders or facilitating linkage with shops for asset purchase on credit/based on faith and referring them for capacity building sessions.
- **Awareness about the environmental safeguards:** Awareness about the environmental safeguards was found to be limited to only not felling of trees as well as tree plantation drives in the village.

6.11.2. Feedback from Project Specialists

The project specialists shared that they are satisfied with the current status of the project implementation and the NRM works which are in progress. All the PS were found to be aware of the environmental safeguards checklist specified in ESMF guidelines complied as part of the project implementation through village development plan. The knowledge of checklist was found satisfactory as many project specialists mentioned about not felling of trees during NRM works, flood line check during construction of checkdams and godown. GSDA guidelines were also followed in some cases as reported by the PS. It was also reported that the guidelines of ESMF are followed in the villages during implementation of individual and community works. All the project specialists mentioned that they have clarity about the guidelines of the project.

It was suggested that some of the activities under PoCRA which were stopped should now be reinitiated since those were very popular among the farmers. There was demand for restoring the closed activities such as pipes and motors and there was demand for solar pumps and farm fencing to mitigate the menace due to wild animals. In Jalana there was demand for adding mushroom cultivation as an activity. Also, PS from Osmanabad suggested that project must also carry out NRM work in the forest area which are near to farm fields. To increase the participation of women in the project, it was observed that the FFS were conducted for the women exclusively as well as guidance was provided to women and vulnerable groups for formation of small teams in the village.

The activities related to updating the portal with VCRMC details were found to be conducted regularly. The main responsibility for updating the data of VCRMC is with the CA and AA with support from the PS HRD. The frequency of field visits of the PS HRD was found to be 4-5 days per month. The key task is to visit VCRMCs and support them. There were no exposure visits arranged in Aurangabad, Beed and Nanded. Other districts have conducted atleast 1 exposure visit. Most exposure visits (around five) were conducted in Hingoli. Every exposure visit covered around 50-70 farmers for capacity building. The PS HRD mentioned that they attend the VCRMC meetings regularly and the frequency of VCRMC meetings attended in last 6 months was found to be 5-10 in some cases while the online VCRMC meetings were 25. They mentioned that on an average, they spend 4-5 days in visiting the villages in a month. It was also reported by the PS that in PMG Disha, the trainings are arranged by CA for a batch of 20 women and they are enrolled under the project. The training related to NRM works was attended by all the PS Agriculture. However, they suggest revision in the training content by including training on recharge shaft.

6.11.3. Feedback from Agriculture Assistants

The problems faced while working as non -executive member is majorly in constituting the committee especially in COVID times when there were problems in organizing the Gram Sabha and selection of the members. It was reported that Krushi Tai's work was regularly monitored, and proper guidance was given to regularize the work. It is found that communication through Krushi for creating awareness was the most effective strategy used to increase the participation of women and marginalized sections i.e., SC/ST/small farmers/widows. The main reason for the delay in spot verification as well as approval was mentioned as the workload reported by some AA. Some AAs reported that the farmers do not cooperate for spot verification when the AA is in the village. All the AAs opined that the guidelines are very clear and there is no need to change. It is observed that the activity of micro-irrigation was having the highest demand among the farmers, especially the drip and sprinkler because only these activities for water and irrigation are currently present in project. It is followed by horticulture, the second most popular activity amongst the farmers. The suggestion to add new activities in the project were the solar pumps as well as individual onion storage structure and fencing. However there was also major demand for restoring the closed activities especially the community farm pond from many AAs.

For the landless, the activity of goat rearing was suggested to be restarted by most of the AAs. Some AAs reported problems in the implementation of PoCRA, such as lack of farmers' interest due to upfront investment and their lack of knowledge regarding the process of implementation such as documentation and guidelines. In the sampled villages, only 4 villages were covered under the NRM works. When asked about the delay in the carrying out the NRM works, it was observed that the farmers do not agree for the consent letter on Rs. 100 stamp paper, as well as in some cases due to standing crops the machinery cannot reach the spot. It was also found that the demand for drainage line treatment work is most usual among the NRM works in which preference is given for Earthern Nala bund followed by the Cement Nala Bund for percolation of groundwater. It was found that agricultural assistants had good knowledge of environmental safeguards and most of the AAs said they felt that plantation as well seed of grass on the farm pond may help reduce soil erosion. Some said that they motivate and train people to safely dispose the pesticide bottles after use. The AAs stated that the activities of carbon sequestration such as horticulture and bamboo plantation are in good demand based upon the water availability in the villages. Some AAs suggested that there is need for training the farmers in the villages where there is a large number of horticulture plantations under the project.

6.11.4. Feedback from Agriculture Supervisors

The best integrated pest management (IPM) technique suggested by most of agriculture supervisors was the use of neem extract formulation for spraying in the crop to avoid pest infestation. Some supervisors also mentioned that the awareness and adoption of burying the empty pesticide bottle has also increased in the villages. According to agriculture supervisors, the drip and sprinkler were the most useful technologies given under the project, followed by horticulture plantation and farm mechanisaton. There was no problem in understanding the guidelines, and all guidelines are clearly mentioned. Almost all the agriculture supervisors (AS) mentioned that they do not have any issues in the monitoring of the works but one AS reported that there is a problem of mobile network during the work verification in the villages. All the supervisors expressed satisfaction on the digital applications and feel that they are easy to use. It was suggested by the supervisors that the farmer trainings must be arranged at the village level to increase the capacity of the farmers. Almost all the supervisors said that they do not face any major problem in the project implementation.

> **Reason for delay in approval and registering completion of work:** In many cases the applicant does not have land in the project village though he is resident of village under PoCRA, leading to delay and further cancellation of application. The shortage of manpower also sometimes delays the process of presanction and spot verification.
>
> - Agriculture supervisor

6.11.5. Feedback from Cluster Assistants

Many CAs reported that the farmers are ready for compost pits of NADEP and Vermicompost, but some farmers feel it has high cost than the estimate as well the compulsion of domestic animals. The most demanded activity was found to be the irrigation assets such as drip and sprinkler as farmers perceive that the water use efficiency will increase through these assets. The reason for delay in approval in application was reported as workload, and in some cases it was reported that the VCRMC meetings do not take place often and therefore process is delayed. When asked about the communication with Krushi Tai, the CAs mentioned that the Krushi

Tai is the main key point person and she is always present whenever needed for help such as meeting farmers, especially women farmers. CA's awareness regarding environmental safeguards was limited to avoiding tree felling during the construction of NRM works.

6.11.6. Feedback from FFS Facilitators

FFS Facilitators are involved in mobilizing farmers for FFS, giving farmers information about the latest technologies as well as training them for reducing the cost of cultivation and increasing the income. Some facilitators also shared that it was their responsibility to make the village climate-resilient through the use of technology. Almost all the facilitators said that they train the farmers for the disposal of empty pesticides in the FFS. The most used disposal method was found to be burying of the bottles in the ground. Neem extract formulation was the most demonstrated activity as reported by the facilitators which was followed by bird perches, pheromone traps, seed treatment as well as BBF technology.

Though FFS exclusively for the women was conducted in most of the villages, the main challenges found in arranging the women's FFS was found that those women give priority to domestic work rather than FFS as well as in some cases, women also prefer to come with husband. The traditional techniques used by the farmer to fight climate change are spraying intensively to avoid pests, intercropping and use of farm yard manure.

The FFS facilitator shared that the farmers are aware of the global warming phenomenon to some extent. There was variation in the use of organic farming and the use of organic fertiliser was found to be between 2-50% in the villages. The awareness regarding the use of banned pesticides was found to be satisfactory in the villages, as reported by the facilitator. Special efforts taken by the facilitator to reduce the production cost was found to be encouraging for the use of Nimboli ark as well as seed treatment and use of zero tillage in the field.

6.11.7. Feedback from FFS Coordinators

FFS coordinator helps in facilitation of FFS activities in the project villages which included activities mainly related to note down the observations from FFS app, check the attendance of guest farmers, preparation of timetable for the FFS well as coordination and skill development of the facilitators. Other responsibities mentioned by them were the preparation of booklets, arrangement of meetings and trainings for the facilitators and monitoring work of facilitators. The timetable for the FFS is decided based on the season of the crop as well as, in some cases, it is prepared by the SDAO and given to FFS coordinators. The schedule is decided 8 days before the FFS for a village, and farmers are informed with the help of KT as well as on the WhatsApp group. The method adopted for improving the skills of the facilitator is by enhancing their knowledge during the meetings conducted twice a the month. Demo sessions are also conducted exclusively for the facilitators. The monitoring method adopted by the coordinators for evaluation of work is to review the observations communicated by the facilitator in the FFS sessions on every first and third Saturday of the month at the SDAO office. Other than a meeting, they are trained through webinars and WhatsApp and also they are given demonstrations on the field.

The efforts made by the FFS coordinator to promote improved agriculture practices were mainly motivating farmers for the use of climate resilient seeds along with the BBF technologies. Most FFS coordinators reported less attendance of women as compared to men because of their involvement in domestic work.

The most used technology adopted by farmers after the FFS session is IPM, in which formulation of Nimboli Ark was mostly used by farmers followed by BBF technology and intercropping. Some coordinators reported that they have worked on preparing the booklets related to SR technology, zero tillage and use of machinery for agriculture. Coordinators also expressed need for the training of the facilitators through KVK and retired scientists of Agriculture stream. Other than a meeting, they are trained through webinars and WhatsApp as well as demonstrations on the field.

6.11.8. Feedback from Krushi Tai

The major motivation for Krushi Tai to work under the project comes through encouragement from gram panchayat and other officials. Few were self-motivated and wanted to help farmers. Some of them were keen to learn advanced farming techniques and thus took the responsibility of Krushi Tai. Most of the Krushi Tais see their role in mobilizing farmers, disseminating information regarding the project, and guiding farmers regarding the project and farm-related activities. Only four of the interviewed Krushi Tai's were aware that the project has initiated digital Saksharta program (PMGDISHA-Pradhan Mantri Gramin Digital Saksharta Abhiyan) for all women stakeholders of the project. Out of four KTs aware of this program, only three have been enrolled in this program. The main challenges faced by the KTs were reported as the conflict of timing for domestic work as well as network issues for attending trainings. Also, all KTs said that they received help from family members, which was limited to pick up and drop at farmer site as well as meeting venue. One KT

mentioned that they face challenge in attending the meeting when the village is in a group panchayat, and a lot of traveling is involved. Eight Krushi Tais interviewed knew about the beneficiary priority criteria in the DBT app.

Training Received by Krushi Tai

- Only two of 15 Krushi Tais acknowledged that they had undergone any training under the project. One KT mentioned having attended the online webinar.
- No Krushi Tai has been part of an exposure visit under the PoCRA project.

Past Experience and Motivation Factors

- **Experience:** All of the Krushi Tais were working for the first time in the project.
- **Motivation factor:** Encouragement from Gram Panchayat and other officials. A few were self-motivated and wanted to help the SHG members.
- **Support from family:** All Krushi Tais received support from their family. Assistance was in the form of travel and help in arranging meetings.

Awareness on Project

- **On their role in project:** Almost all of the KTs see their role in mobilizing farmers, disseminating information regarding the project, and guiding farmers regarding the project and farm-related activities. Only 6 KTs acknowledged they participated in PoCRA Micro-Planning.
- **On performance evaluation criteria**: Most of them (10 out of 15) were aware of the specific indicators on which their work is reviewed. Reported evaluation criteria included the number of meetings arranged (most common response).

Operational Aspects

- **Mobilization activities undertaken by KTs:** Generally done through informal conversation and door-to-door meetings to share information about PoCRA and the potential benefits from the project.
- **Challenges faced:** One Krushi Tai expressed concern about network issues in the village due to which she was facing problem in contacting the farmers.
- **Payments of Honorarium of KTs:** None of 15 Krushi Tai's have received their first remuneration as Krushi Tai. All 15 Krushi Tais were aware that VCRMC is responsible for their monthly remuneration that is supposed to be paid quarterly.

6.11.9. Feedback from Taluka Agriculture Officers

The challenges faced by the TAO were mentioned as the low availability of the manpower in the department resulting in the workload. Also, non-availability of computer and printer at the Taluka level is also creating the problem for giving pre-sanctions and the pendency of work has increased. One TAO said that the activities like well recharge and compost if done in bulk or community will reduce the skilled labour cost of the activity and would be helpful to the project. All of the TAOs said that they do not face any problem in spot verifiacrtion as well as post-work verification. All TAOs felt that the project guidelines are clear and need no change.

6.11.10. Feedback from Sub Divisional Agriculture Officers

All the SDAOs mentioned that there was clarity in the guidelines and there is no need to review or change any of the guidelines. The strategies adopted for increasing women's participation was found to be the women FFS arrangement by announcement on loudspeaker in the villages and the motivation of women with the help of village-level staff in the Gram Sabhas as well as meetings. The help of SHG was also being taken in Jalana as reported by the SDAO. In addition to current activities Oyster (pearl) farming must be included for which there is a training institute in Aurangabad, this will boost the farmers income. There is demand for inclusion of solar pump in the project. The main challenge faced by the project is the shortage of staff for the implementation of activities. One SDAO suggested that the 4 villages must be maximum the limit for one CA instead of 14. SDAOs feel that there were problems in giving the online training in many places and the trainings which are taken offline have higher impact, so offline training must be conducted while taking all necessary precautions.

6.11.11. Feedback from DSAO

It is shared that there is need for increasing the staff for mitigating the grievances from the farmers regarding the delay in the pre-sanction and the spot verification activity. It was reported by Nanded DSAO that the district was too big and in total of 15 districts, nine TAO post are vacant. The remaining TAOs faced problems in documentation due to lack of computers and printers. The participation of women can be ensured in the project by at least keeping some activities reserved only for women farmers. The appointment of the KTs has also been helpful for increasing the participation of women as mentioned by the DSAOs. All DSAOs shared that the guidelines were clear and no problem has occurred for this activity. Many DSAOs shared that fencing activity, if given to the community can be helpful and must be added to project. The main challenges mentioned were the fewer CAs in the project which can be increased or the cluster size must be decreased..

6.11.12. FPO

Out of the 16 interviewed FPOs, 15 of them were registered in the time span of 2018 and later, indicating that there was awareness about the project activity of grant for Agribusiness activity. Out of the 16 interviewed FPCs 14 were engaged in custom hiring center and others. Two FPCs were engaged in floor mill unit and cold press oil extraction unit. The member size of FPO ranged from 10 to 1500 members. Many FPOs reported that they were engaged in the procurement and selling of cereals before starting the agribusiness activity. Majority of the board directors reported that they had taken training for the business at some point after starting the activity.

Many FPOs stated that they give special discounts on services to women members, which is generally an additional 5-10% less than the actual market rate, and some FPOs said that they give training to women for skill development and strengthening. In the case of custom hiring centers, all machinery and tools were found in good condition. The member of the CHC floor mill are delivered the services which are generally 5% less than the market rate. Some FPOs said that they give upto 30% discount to the members of CHC. The FPOs reported that they did not find any specific challenge in fund arrangement as the members have gathered the amount for establishing the business. The waste management was not the issue in case of CHC but the the other FPOs in mill and oil extraction efficiently used the waste in the form of selling the oil cakes as well as proper disposal of floor mill waste.

Many FPOs also expressed the challenge that they are not getting the support from banks for expansion of the business as banks are asking for properties as mortgages. The major help received was from the project staff as well the Agriculture department for the preparation of the business proposals, and many FPOs also said that the Chartered Accountant also helps in the preparation of the business plan. The waste was managed by making biogas as well as compost by many of the FPOs. Most FPCs said that the profit is not shared among the members, but utilized for the expansion of the business. Some also use it for paying off the debt of the FPC. The FPC directors expected help of the Agriculture department for getting the loans for expanding the current business activities.

6.12. Key Experts Field Visits

6.12.1 Agronomy

Visit to Chinchadgaon village, Vaizapur taluka Aurabgabad district and impact of PoCRA project activities

On 28.1.2022, Chinchadgaon was visited. This village is a medium-sized village located in Vaizapur Taluka in Aurangabad district. As per 2011 population census, 360 families with 1149 members are staying in this village. Out of which 902 are males and 847 are female. The literacy rate of Chinchadgaon village is 73.82% compared to 82.34% of Maharashtra. In Chinchadgaon male literacy rate is 84.94% while female literacy rate is 62.02%.

In Chinchadgaon village, out of total population, 1004 are engaged in work activities. 99.30% of workers describe their work as Main Work (Employment or Earning for more than 6 Months) while 0.70% are involved in marginal activity providing livelihood for less than 6 months. Of 1004 workers engaged in Main Work, 689 are cultivators (owner or co-owner) while 253 are Agricultural labourer.

As per Maharashtra Agricultural Census on Taluka wise agricultural data of 2011-12 to 2015-16 (www.mahaagric.gov.in), the productivity of major field crops are very low. On an average of five years data on productivity of major field crops in Vaizapur taluka are 632.2 kg/ha bajra, 1356 kg/ha maize, 485.2 kg/ha red gram, 350 kg/ha black gram , 601 kg/ha green gram, 1575 kg/ha soybean , 481.8 kg cotton lint/ha (1417 kg seed cotton yield). These crops were grown under rainfed situation during kharif season. That time during

Rabi season, only limited crops with limited area were brought under cultivation due to non-availability water resources structures. Under such constraints, the productivity of Rabi jowar was 288.9 kg/ha, wheat 647.8 kg/ha and Rabi maize 525 kg/ha. The cultivation of high value cash crops were not grown by the farmers. However, due to introduction of PoCRA project in the year 2018, and development of water resources structures in combination with adoption of advanced crop production technologies in one of the identified village i.e. Chinchadgaon, the productivity of major kharif and Rabi crops has been improved significantly. The detailed activities are summarized in the following text for reference.

Rainfall pattern of Aurangabad district: The scenarios of long term normal rainfall distribution pattern of this district is 623.5 mm from South West Monsoon, 83.5 mm from North East monsoon(October -December), 3.8 mm from Winter (Jan-March), and 23.3 mm from Summer (April May) with annual rainfall of 734.3 mm in 39 rainy days. During kharif 2021, the monsoon rainfall from 2.6.2021 to 29.9.2021 was 1000.5 mm. This excess rainfall against the normal rainfall, was used effectively as supplemental irrigation to kharif standing crop as well as the present Rabi crops. During October 6, 2021 to December 29, 2021, the total rainfall was 128.5 mm, which was quite good. This rain water has enhanced more area under cultivation due to significant amount of ground water recharge in constructed open well (about 7-10 ft below the soil surface). Even after pumping, the recharge of the open well is quite high as the water movement in the aquifer is good.

Table 6.47 Weekly rainfall pattern during Kharif 2021

Sr no.	AURANGABAD		
	Weekly rainfall with date	Rainfall received , mm	% deviation over normal rainfall
1	2.6.2021	34.1	288
2	9.6.2021	59.1	139
3	16.6.2021	12.5	-63
4	23.6.2021	15.8	-48
5	30.6.2021	53.8	45
6	7.7.2021	0.6	-98
7	14.7.2021	109.8	281
8	21.7.2021	36.6	9
9	28.7.2021	22.3	-45
10	4.8.2021	7.6	-78
11	11.8.2021	5.5	-87
12	18.8.2021	58.4	118
13	25.8.2021	82.2	131
14	1.9.2021	62.7	70
15	8.9.2021	149.9	285
16	15.9.2021	22.2	-32
17	22.9.2021	61.8	89

Sr no.	AURANGABAD		
	Weekly rainfall with date	Rainfall received , mm	% deviation over normal rainfall
18	29.9.2021	205.6	433
19	6.10.2021	64.4	224
20	13.10.2021	18	2
21	20.10.2021	23.8	30.1
22	27.10.2021	0	-100
23	3.11.2021	0	-100
24	10.11.2021	0	-100
25	17.11.2021	0	-100
26	24.11.2021	25.6	218
27	1.12.2021	0	-100
28	8.12.2021	5.1	30
29	15.12.2021	0	-100
30	22.12.2021	0	-100
31	29.12.2021	1.6	36

Agricultural activities in village Chinchadgaon:

The following activities under the PoCRA projects have been/are being implemented in this village:

1) Apiculture: nil
2) Back yard poultry: nil
3) Vermicompost: nil
4) Drip irrigation: 82 beneficiaries
5) Farm mechanisation: nil
6) Farm pond: 83
7) Farm pond lining: 4
8) Promotion of BBF/zero tillage or minimum tillage: nil
9) Horticulture plantation/agro-forestry/island fisheries: 15
10) Others: nil
11) Irrigation water conveyance pipes: 34 beneficiaries
12) Planting material in polyhouse/shed-net: nil
13) Poly house/poly tunnel: nil
14) Recharge of open dug well: nil
15) saline and sodic soil land/farm pond/sprinkler water pump /FFS: 32
16) Seed introduction: nil
17) Sericulture: 11

18) Shed net house: 15
19) Small ruminants: 5
20) Soil and water conservation practices: nil
21) Sprinkler irrigation: 118
22) Water pump: 14
23) Well: nil

Adoption of agro-technology: Under this component of Climate-Resilient Agriculture Technology, the farmers have been using improved, high yielding and resistant to adverse climatic aberration varieties. Recently the improved new and certified varieties instead of old and traditional low yield potential seeds/varieties have been replaced by the farmers. As an example, in case of soybean, the farmers have started cultivating summer soybean varieties like MAUS 71, MAUS 158, MAUS 612 and using the soybean seeds only for seed production for coming kharif season. Other improved crop production technologies like irrigation methods (pressurised irrigation instead of flood irrigation), protective irrigation, shed-net unit with high value cash and ornamental, olericulture crops, integrated fertiliser management, integrated pest management, crop residue management, soil and water conservation technologies, mulching are also being used by the farmers of this village because of significant water resources structures available with them for intensification of all activities.

Soil type and fertility status: The farmers of this village (Chinchadgaon) have received soil health card from Taluka Agriculture Officer as narrated by Sarpanch, members of the Gram Panchayat as well as the farmers of this village. After reviewing the soil health card of one of the farmers, it has been observed that the nutrient status on an average was found to be low to medium in available nitrogen, medium to high in available phosphorus and medium to high in available potassium. Regarding other micro nutrients like Sulphur, Zinc, Boron, Iron, it was low and for Manganese and Copper, it was medium. Most of the farmers are not adopting the guidelines of the soil health card and using inorganic fertilisers like neem coated urea, DP and MOP as per the recommendations provided by the state agriculture department.

Management of soil fertility status: For maintaining soil fertility status in sustainable form, the farmers are applying FYM every year as per recommended dose , growing leguminous crops like soybean, green gram, black gram, red gram during kharif season and chick pea in Rabi season in cropping system. Since the contribution of the major plant nutrients is very much limited from these leguminous crops (maximum up 35 kg N/ha per season), the farmers are supplying inorganic fertilisers to harvest potential yield of kharif, Rabi as well as high value cash crops. They are also using biofertilizer like Azotobactor in case of non- legume crops and Rhizobium culture in case of leguminous crops to enrich atmospheric nitrogen fixation capacity in soil. In case of vegetable and high value cash crops, the farmers are using FYM, humic acid as well as crop growth stimulants through soil application as well as through drip system and keeping their soil nutrient status in a balanced form. Growing of green manuring crop like Dhaincha and Sun hemp during kharif season and burying the same in the field after 35-45 days is also an alternative solution for keeping the soil in sustainable form. In the PoCRA adopted villages, the farmers are exploiting soil nutrients by growing nutrient exhaustive crop in cropping system. Hence, it is highly desirable to analyse soil fertility status every three years and provide suitable guidance for keeping the soil in sustainable form through technical support from the state department of agriculture. Sometimes, the standing field crop suffers from major and micro nutrient deficiency due to low mobility/non- availability, then spraying of the nutrients in appropriate concentration leads to improvement in crop yield. In case of cotton, when nitrogen and phosphorus deficiency is observed (in case of leaf reddening), the farmers are generally advised to use 2% DAP or 1% Urea and 1% Magnesium sulphate as spray solution and reduce the intensity of leaf reddening in cotton crop. Due to moisture stress and nutrient stress, shedding of squares and flowers occurs. Under such conditions, it is suggested to spray NAA 4.5 SL @ 5 ml per 10 litre of water and control natural shedding of squares and flowers. In this way, the farmers are keeping their cultivated land sustainable.

Integrated pest management: Most of the kharif and Rabi crops are affected by sucking pests like aphids, jassid, white bug, mealy bugs. To control these pests, the farmers are using biopesticides like NSKE/neem oil with appropriate quantity and spraying at specific time interval during crop growth period, unlike other high cost synthetic pesticides. They are hardly spraying 2 times of the biopesticides instead of 5-6 times of chemical pesticides. The cost of biopesticides comes to Rs 450-500 and chemical pesticides Rs 800- 900/per spraying. During initial crop growth period, use of biopesticides and insect/pest stickers saves considerable amount of money towards synthetic pesticide cost. In case of chick pea which is major Rabi crop of this area, the farmers install pheromone traps, places bird perches above crop canopy at regular interval in the field at the rate of 8-10/acre to attract predatory birds and controlled pod borer.

In case of cotton borers (american boll worm, pink boll worm in cotton, and stem borer, pod borer in other cereal , oilseed and pulse crops), the farmers are growing pest trap crops, surrounding the main field crop as well in between rows of main field crop in appropriate ratio and avoiding crop damages due to stem borers, cotton boll worm. When the intensity of pest is quite high, the farmers are using synthetic pesticides and controlling the intensity of pests. Use of Pheromone traps in case of cotton pink boll worm saves significant amount of money against the use of synthetic pesticides like Propenofos/Cloropyrifos/Quinolfos at the rate of 20-25 ml per 10 litre of water. Use of such pesticides damages the multiplication of beneficial insects as well as reduces microbial activities in the soil.

Other crop residue management also played significant reduction in control of pests. In case of cotton crop, they destroyed the boll rot diseased crop debris, pink bollworm infested bolls and leftover from the fields to check carryover and reduction of inoculum of the pathogens and pests. It also avoided stacking of cotton stalk on the field bunds or at home. In some of the villages the stalks were shredded and used for composting at the earliest where the cotton shedding machines were available on contract/hire basis. At cotton collection and storage centres cleanliness and mass trapping (pheromone traps) for pink boll worm adults have been done to reduce carry over during next year. The farmers made deep ploughing and exposed the soil to high temperature and sun, as well as predatory birds and controlled the pink boll worm for further spreading. These advisories were given at weekly intervals to the farmers through the Agriculture Department.

Implementation of BBF technology: The farmers of this villages are well aware about the importance of advance crop production technology. Through the modern technology, lot of benefits with respect to water conservation, fertiliser and labour cost , improvement of soil aeration in case of heavy soil under heavy flooded waterlogged situations has been observed but due to non-availability of the equipment at gram panchayat level, they have not taken up this BBF method of planting. The major issues for non-adoption of this technology on a wider scale is due to light type of soil where the soil is originally well-aerated. Even during heavy rainfall period, the stagnation of water is negligible. While discussion, the farmers informed that the ATMA has made a group of 11-12 farmers and provided one set of BBF implement. This equipment can be used on contract basis in coming year to spread BBF technology in kharif soybean as well as in kharif maize crop as these are being grown under flat bed system by drilling method or by tractor drawn seed driller. The ATMA group is providing BBF planter at the rate of Rs 1300 per acre and the farmers of the adjoining villages are using this implement in kharif maize. The cost for operating this equipment comes to Rs 1300/per acre. In future, soybean and maize can be covered in BBF during next kharif season 2022.

Implementation of shade net unit: In this village, the beneficiaries have been effectively using shade net under controlled environmental condition for growing high value vegetable crops like green chilli, capsicum as well as flowers (Olericulture). Some of them are using shade net unit for vegetable seed multiplication as seed industries are in high demand. In this village about 15 shade net units, having total area of one acre each, have already been installed by the farmers with financial support from PoCRA. So to assess the economic performance of the shade net unit, Consultant, Agriculture Assistant, CA, and Gram Panchayat Sarpanch visited one of the shade net units of Shri Bhagvan Namdeo Kadam. Last year he had taken the same crop for a long period and after harvest, he kept the shade net unit without crop till planting of recent Capsicum on 8th November 2021. Last year the same farmer earned Rs 1.50 lakh as net profit from one acre area of this unit. Had he continued second crop like watermelon or muskmelon after harvest of the capsicum, he would have earned substantial farm income from this small unit. This year, the same famer is willing to take second crop after harvest of this standing crop of capsicum. In general, the farmers are intensively cultivating high value cash crop with heavy amount of fertiliser (organic and inorganic) through soil application and through fertigation. However, they have not reported the exact quantity of inputs added through soil as well as through drip system. With regards to the irrigation water applied, they are not properly following the guidelines. 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 as per evaporative climatic water demand (ETcrop). So to understand the accuracy of water application to be added in capsicum as well other crops, the following equation is to be followed and applied at field level –

Irrigation water in litre per plant (in litre) $\frac{(Lateral\ spacing x\ emittor\ spacing\ )x\ Crop\ coefficient\ Kc\ \ x\ ETo)}{Uniformity\ coefficient\ (90\%)}$

Suppose

i) The lateral spacing is 1.5 m,

ii) dripper spacing is 0.45 mso the total wetted area is 0.675 sq. m. If two rows are covered with single emitter (in case of paired row planting), the wetted area will be doubled.

iii) Crop efficient of the capsicum as per FAO 56 Irrigation and drainage bulletin no. 56 is 0.60, 1.15, 0.70 during initial, mid and maturity stages, respectively.

iv) Calculation of reference ETo is to be done as per FAO 56 PM method or any standard temp based method, which shows minimum error over FAO PM method. The easiest way of ETo estimation method is Hargreaves method. The suggestion over this approach has been given in FAO 56 Irrigation and drainage bulletin as this method requires temperature and radiation values for ETo calculation.

v) The time of pump operation is calculated by using discharge rate of emitter (litre per hour) and number of emitters in one acre area, or the area covered under drip irrigation.

vi) Final calculation for irrigation water to be applied at 3 days interval is = {(1.50m x0.45 m) x1.15 Kc x 15 mm ETo of three days } divided by 90% uniformity coefficient of drip design.

vii)Total amount of irrigation water per emitter will be = 12.937 lit. If the number of available emitters in the cropped area is multiplied with this amount of irrigation water, we can get the values of total water to be applied to the crop at three day intervals. The time of operation of the electric motor is then calculated based on discharge rate of emitter. Suppose the discharge rate of emitter is 2 litres per hour, then the time of operation of the pump will be 6.47 hours (12.937 litre divided by 2 litre per hour).

For calculation of irrigation water, to be applied in any crops through drip, sprinkler and flood irrigation method, the following observations including meteorological parameters are needed.

Drip: Lateral spacing, drippers spacing, discharge rate of the drippers, pressure head at delivery points of pump, crop coefficients, ETo (calculated based of meteorological parameters, rainfall), uniformity coefficient of the drip design, time of operation, area irrigated, irrigation days interval. In horticulture crops, the additional data on shaded area during noon time may be considered.

Sprinkler : Discharge rate of electric pump and sprinkler riser, water distribution uniformity, no. of riser, pump operation period, area covered, ETo, crop coefficient.

Surface Irrigation (border strip, check basin, ridge furrow, alternate furrow, alternate irrigation in alternate furrow): Discharge rate of water at field level, total time of operation in hrs, area irrigated, ETo and crop coefficient.

Note: The values of crop coefficient at 10 days interval is also derived by calibration with FAO-CROPWAT mode. With the help of this model the KC value has already been done for cotton crop for 180 days growing period by Dr. R. B. Singandhupe under various climatic conditions and soil types. In other field crops including vegetable and horticultural fruit crop, it can also be derived for irrigation scheduling and assessment of WP of different crops being grown in project implemented areas.

Figure 6.3 Shade net unit at village Chinchadgaon in one acre area with capsicum. Farmer's name: Bhagvan Namdeo Kadam.

To ensure an additional income from the Farm, the farmer has been growing onion and maize during Rabi season under drip system. In case of maize crop, the same farmer produced 40 q/acre under drip irrigation and about 30 q/acre in flood irrigation system in 125 days crop duration period. Under rainfed condition, the same farmer was harvesting only 10-12 q/acre but due to introduction of irrigation facilities, the same farmer is now harvesting very good grain yield and earning more income. This has happened due to PoCRA project activities.

In the adjoining area , Shri Vijaya Namdeo Kadam took benefit of PoCRA project for installing solar operated 3 Hp pump by paying Rs 16500 out of total cost of Rs 3.00 lakh. Rest of the amount was paid through PoCRA

project. He also got substantial benefits in term of subsidy through sprinkler and drip irrigation sets. During kharif season, he had grown maize in 4 acres (additional 2 acres on lease), cotton in 1 acre and onion in 2 acres area. Before introduction of the PoCRA project the same farmer use to harvest 5-6 q/acre of seed cotton, 10-12 q/acre maize and onion (not reported by the farmers but now onion bulb yield comes 20-25 q/acre). Last year he had grown onion in his field under drip irrigation and provided irrigation water through drip as well as through sprinkler. This year also he has brought the whole area under onion crop with 0.18 acre under wheat crop. Last year he harvested wheat crop to the extent of 10 q/acre. Earlier the same farmer used irrigation water by flood method and about 50% irrigation water was being applied by him in all mentioned crop whenever it was needed due to long dry spell during kharif and Rabi season. In onion, he has applied pre-sowing irrigation and plantin of seedling has been completed. When we enquired about the irrigation scheduling criteria, he explained in the following ways. Once the seedlings are well established in the field, he was applying second irrigation at 15 days interval, third and subsequent rounds of irrigation at 8 days interval with total number of irrigation rounds of 6 + 1 pre-sowing irrigation. Then he terminated the application of water after 90 days of planting and allowed the onion bulb to dry in field for 15-20 days. At present in Rabi season he is using 3 Hp solar operated pump for irrigating onion crop, which was supported through PoCRA project. Last year, he harvested 50 tonnes per acre and earned gross income of Rs 2,50, 000 (at the rate of Rs 25000 per tonne). When enquired about scheduling of irrigation as well as quantification of irrigation water delivered to onion crop, he was totally unaware , but he narrated that about 6 hrs with discharge rate of 4 litre per hour is required to cover one acre onion crop with different lateral, emitter and 9 days ET values. Still he is missing some of the parameters like crop coefficient values being used in different growth periods and uniformity coefficient. In this way, irrigation water comes to 24 litre per emittor. Use of drip/sprinkler irrigation in onion is highly effective with respect to saving irrigation water and improvement in bulb yield. This year he has covered large area under drip system and he may earn lot of money from his available cultivated area. In this village the onion storage facility with total capacity of 50 tonnes has been created by the group of farmers. If more number of such storage structures are created by the state agriculture department through various schemes, the farmers may keep their produce and sell once the market rate has increased reasonably.

Operation of solar pump: He has installed solar pump in open well. This open well was constructed by him 20 yeas ago. The depth of the open well is about 40 ft and diameter is 25 ft. The water level from the surface at present was 7-8 ft. Earlier due to non-availability of sprinkler and drip units, 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 large number of consumers, the farmers are facing severe problem to operate their irrigation pump during day time. This set up has given very good advantage to this farmer for bringing more area under irrigation. 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. They are paying Rs 10,000 per year as electric supply charges to the distributor but they are not receiving electric supply during day time.

Figure 6.4 solar pump of 3 hp being used for irrigating 5 acres of land in Rabi season by the farmers under pressurised irrigation system. In wheat crop (0.18 acre area) he has installed sprinkler (back side of the farmer) for irrigation.

Constraints in electric power supply for irrigation and its alternative : In this area, sufficient amount of well water is available for growing Rabi as well as summer season crop, because of development of farm pond as a secondary reservoir and construction of cement bandhara on drainage nala. When all government officials, and consultants visited and discussed with one of the women farmers who leads a farming family, she informed that she is cultivating mulberry for rearing silkworm and harvesting hardly 3 cycle of silk cocoon

only during kharif season and not harvesting during Rabi season due to lack of power supply in proper time for irrigating mulberry plant as the leaves are used as feeding material. She has constructed one open well with her own expenses. The depth of the well is 35 ft depth. On that day, the water level of the well was hardly 8-10 ft depth. She urged the government officials to make necessary arrangements and provide electric supply through any type of electric source so that the available water resources can be used in sericulture as well for growing Rabi crops under pressurised irrigation system. While answering, agriculture assistant promised to initiate the official formalities for providing solar pump of suitable horse power as per the guidelines of the government in other schemes as well. Further he said that a lot of famers have been demanding additional open well in this area, however as per the guidelines of Ground Water Development Agency, Government of Maharashtra as well Central Ground Water Board, Government of India, if the village comes under over exploited zone (>85% ground water development), the agency may not approve for additional open wells in such area. Hence we suggested to the farmers to avail the facilities of solar power pump, if government sanctions from other schemes. As per guidelines, only 2-3 open wells are permitted, but in this village, a lot of open wells are available as the farmers have constructed them, pumping the open well water and storing in developed farm pond.

Farm pond: In this village, substantial number of farm ponds (about 83 in numbers) 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. Shri Vijaya Kadam has received Rs 2.50 lakh i.e. Rs 1.80 lakh for lining material and Rs 0.70 for excavation of pond. Total cost of this dimension of farm pond was Rs 3.50 lakh. So he contributed about Rs 1.00 lakh and developed very effective water reservoir for irrigating his field crop. Out of total farm ponds, only six ponds are lined and the remaining are unlined. Due to unlined farm pond, the seepage loss of water occurs to the extent of 3 mm per day depending upon the soil textural class at the bottom portion and inside area of the pond and wetted area. To avoid such water loss, lining of the pond is essential. Regarding water loss through evaporation from open water body, the extent of 18% water loss occurs through evaporation. Increasing storage capacity by deepening the farm pond will not change the quantity of water loss through evaporation but will increase more area under irrigation. Growing of trees like eucalyptus, teak, poplar and other tall growing trees , surrounding the farm pond is also urgently required to reduce water loss from open pond. If the wind speed is reduced by 25% through wind barrier then evaporation loss from open water body is reduced by 5%. So to enhance water use efficiency of the farm pond, implementation of such practices is essential at field level. The provision for making compound surrounding the farm pond is required to protect fish from theft.

At present the farmer is pumping well water with solar operated pump and re-filling water to its capacity of 2700 ml in 100 hours when it is totally empty. He is refilling very frequently and again irrigating the crops by gravity flow method. In some Rabi crops he is irrigating by flood irrigation which is not practically advisable as irrigation application efficiency is about 70% and rest of the irrigation water goes as percolation loss. Hence use of pressurised irrigation is highly economical as field application efficiency is 90-100%.

Figure 6.5 the farmer (Vijay Namdeo Kadam) has made farm pond (30mx30mx3m), using this pond as secondary reservoir refilling water from open well through solar oprated pump and using during Rabi season. Thelining of farm pond saves seepage loss , however evaporat

On 29.1.2022, Rui village was visited where the impact of the PoCRA project on various agricultural activities and how the livelihood of the farmers were changed because of financial assistance provided to small and marginal farmer of the village since inception of the project was studied. For monitoring the impact of the project, Agriculture Assistant Shri K K Pawar, Cluster Assistant Shri P N Mune and Krushi Mitra Shri A A Navale accompanied and reviewed the project activities. With respect to village details, this village is located some 29 km away from district headquarter Beed. Rui is surrounded by Beed Taluka towards South, Wadwani Taluka towards South, Majalgaon Taluka towards East, Ghansawangi Taluka towards North. As per population Census of 2011, total population is 2665 and number of houses are 504. Female population is 47.4%, village literacy rate is 61.3% and the Female Literacy rate is 26.1%. Working population is 60.4%, schedule tribe and schedule caste population is 3.8 and 6.4% respectively.

As per agricultural census of Government of Maharashtra on crop yield status for the period from 2011-12 to 2015-16 (www.mahaagric.gov.in), the crop productivity of major field crops, on an average of five years statistical yield data of Georai taluka, is 746.9 kg/ha kharif jowar, 1149 kg/ha kharif maize, 402.5 kg/ha red gram, 520 kg/ha green gram, 556 kg/ha kharif ground nut, 1123.6 kg/ha soybean, 287.7 kg/ha cotton lint (846.3 kg/ha seed cotton yield), 50.2 kg/ha sugarcane (annual crop). These crops were grown under rainfed situation during kharif season. During Rabi season, only limited crops with limited area were brought under cultivation due to non-availability water resource structures. The yield of Rabi crops were 487.5 kg/ha Rabi jowar, 652.8 kg/ha wheat , 341.3 kg/ha chick pea , 862.0 kg/ha Rabi maize. The cultivation of high value cash crops were not adopted by the farmers. However, due to introduction of PoCRA project in the year 2018-19, and development of water resources structures in combination with adoption of an advance crop production technologies in one of the identified village i.e. Rui, the productivity of major kharif and Rabi crops has been improved significantly. In this village, sericulture is the prime agriculture enterprises which have been adopted by all category of the farmers, irrespective of their land holding and earning substantial amount from this activity.

Rainfall pattern of beed district during kharif 2021: The long term rainfall of this district is quite low as compared to the atmospheric crop water demand. The normal rainfall distribution pattern of this district is 605.4 mm from South West Monsoon (June-September), 94.4 mm from North East monsoon (October- December), 6.5 mm from Winter (Jan-Feb), and 37.1 mm from Summer (March - May) with annual rainfall of 743.1 mm which is received in 31 rainy days. During this kharif 2021, the monsoon rainfall (from 2.6.2021 to 29.9.2021) was 809.2 mm (table 2, fig. 2). This excess rainfall against the normal rainfall, was used effectively for supplemental irrigation to kharif standing crop as well as Rabi crops. During October 6, 2021 to December 29, 2021, the total rainfall was 289.2 mm which was quite good. This rain has enhanced more area under cultivation due to significant amount of ground water recharge in constructed open well. Even after pumping, the recharge of the open well is quite high as the water movement (recoup of well to its original water level) from the surrounding aquifer was good.

Table 6.48 Weekly rainfall pattern during Kharif 2021

Sr no.	BEED		
	Weekly rainfall with date	Rainfall received , mm	% deviation over normal rainfall
1	2.6.2021	37.6	30
2	9.6.2021	51.7	91
3	16.6.2021	50.9	34
4	23.6.2021	16.6	-37
5	30.6.2021	35.5	15
6	7.7.2021	19.6	-25
7	14.7.2021	90.7	240
8	21.7.2021	43.3	78

Sr no.	BEED		
	Weekly rainfall with date	Rainfall received , mm	% deviation over normal rainfall
9	28.7.2021	33.6	-9
10	4.8.2021	1.1	-96
11	11.8.2021	0.20	-99
12	18.8.2021	67.8	178
13	25.8.2021	78.4	125
14	1.9.2021	79.2	117
15	8.9.2021	164	315
16	15.9.2021	7.3	-81
17	22.9.2021	31	-28
18	29.9.2021	182	325
19	6.10.2021	69.1	177
20	13.10.2021	19	-13
21	20.10.2021	19.1	22
22	27.10.2021	0	-100
23	3.11.2021	0	-100
24	10.11.2021	0	-100
25	17.11.2021	0	-100
26	24.11.2021	0	-100
27	1.12.2021	0	-100
28	8.12.2021	0	-100
29	15.12.2021	0	-100
30	22.12.2021	0	-100
31	29.12.2021	0	-100

Cropping pattern: In this village ,earlier the farmers were growing soybean, cotton, green gram, kharif maize under rainfed condition and were harvesting very low crop yield. The present scenarios on crop productivity is cotton 5-6 q/acre, soybean 7-8 q/acre, kharif jowar 2-3 q/acre. During Rabi season, they used to grow chick pea and harvest very low yield. Maize is now growing only for fodder purpose and water availability has increased for Rabi – summer fodder crop.

Agricultural activities in Rui: The following activities under the PoCRA projects have been/are being implemented in this village:

1) Apiculture: nil
2) Back yard poultry: nil
3) Vermicompost: nil
4) Drip irrigation: 117 beneficiaries
5) Farm mechanisation: nil
6) Farm pond: 21
7) Farm pond lining:12
8) Promotion of BBF/zero tillage or minimum tillage: 2
9) Horticulture plantation/agro-forestry: 45
10) Fishery: nil
11) Pipes: 43
12) Planting material in polyhouse/shade net :nil
13) Recharge of open dug well: nil
14) Saline and sodic soil land/farm pond/sprinkler water pump/FFS: 9
15) Seed introduction: nil
16) Sericulture: 57
17) Shade net house: 1
18) Sprinkler irrigation: 6
19) Water pump: 29

Adoption of agro-technology: Under this component of Climate-Resilient Agriculture Technology, the farmers have been using seeds varieties that are improved, high yielding and resistant to adverse climatic aberration. Recently the improved new and certified varieties instead of old and traditional low yield potential seeds/varieties have been replaced by the farmers. Other improved crop production technologies like sericulture (mulberry cultivation, rearing of silkworm, etc.) Irrigation methods (pressurised irrigation instead of flood irrigation), protective irrigation, shade net unit with high value cash, integrated fertiliser management, integrated pest management, crop residue management, organic farming, mulching are also being used by the farmers under different PoCRA adopted villages. They have sufficient amount of irrigation water for adopting such package of practices. Krushi Mitra of the village is giving all types of technological inputs to the farmers through training. He has recently organising 8 classes during kharif and 6 classes during Rabi season. Other government officials as well as KVK officials are imparting training on various agri-enterprises. Recently due to availability of sufficient irrigation water from the farm pond and pressurised (sprinkler irrigation) system, the farmers are growing summer soybean. This year about 15 acres of area has been brought under this crop. The sale price of summer soybean is Rs 9000-10000 per quintal. If the progressive farmers harvest about 7.0 q/acre seeds, then the farmer may earn total income of Rs 54000-7000. Intercropping of cotton-moong and soybean-red gram is also profitable under adverse climatic aberration. At present about 60 % cultivated area of this village is under sericulture and very limited area is in seasonal cereal, pulses and vegetable crops. In horticulture plantation/agro-forestry activity of PoCRA project, the farmers have been growing high value cash crops like onion and earning substantial income.

Soil type and fertility status: In this district, about 29.53%, 11.63% and 58.85% of the cultivated area is deep black soil, medium deep black and shallow black soil, respectively. Since the shallow black soil is dominating in this area, it very essential to analyse the nutrient status, needs and precautionary measures to be adopted for maintaning fertility status in stable form. In this village all farmers have received soil health card from Taluka Agriculture Officer. The soil analysis is done at district soil testing laboratory, Krushi Vigyan Kendra. Based on the status of their soil, the farmers are using organic and inorganic fertiliser to keep their soil in good health. After reviewing the soil health card of one of the farmers shri R R Yavale, it has been observed that the nutrient status, on an average was found to be low to medium in available nitrogen (112 kg/ha), very high in available phosphorus (47.67 kg/ha) and very high in available potassium (666.44 kg/ha). Regarding other micro nutrients like Sulphur, Zinc, Boron, Iron it was low and for Manganese and Copper, it was sufficient. Most of the farmers are not adopting the guidelines of the soil health card and using inorganic fertiliser like neem coated urea, DP and MOP as per the recommendations provided by the state agriculture department.

Management of soil fertility status: For maintaining soil fertility status in sustainable form, the farmers are applying FYM every year, growing leguminous crops like soybean, green gram, black gram, red gram during kharif season and chick pea in Rabi season in their cropping system. Since the contribution of the major plant

nutrients is very much limited for these leguminous crops, the farmers are supplying inorganic fertiliser to harvest potential yield of kharif, Rabi crops as well high value cash crop. They are also using biofertilizer like Azotobactor in case of non-legume crops and Rhizobium culture in case of leguminous crops to enrich the soil with atmospheric nitrogen fixation in soil. In case of vegetable and high value cash crops, the farmers are using FYM, humic acid as well as crop growth stimulants through soil application as well as through drip system and keeping their soil nutrient status in a balanced form. In the PoCRA adopted villages , the farmers are exploiting soil nutrients due to intensive cultivation. Hence it is highly desirable to analyse soil fertility status every three years and provide suitable guidance for keeping the soil in sustainable form through the technical officials of the state department of agriculture. Sometimes, the standing field crops suffer from major and micro nutrients deficiency due to low mobility/non- availability, then spraying of the nutrients in appropriate concentration leads to improvement in crop yield. In case of cotton, when nitrogen and phosphorus deficiency is observed (in case of leaf reddening), the farmers are generally advised to use 2% DAP or 1% Urea and 1% Magnesium sulphate to reduce the intensity of leaf reddening in cotton crop. Due to moisture stress and nutrient stress, shedding of squares and flowers occurs. Under such condition, it is suggested to spray NAA 4.5 SL at the rate of 5 ml per 10 litre of water and control natural shedding of squares and flowers. In this way, the farmers are keeping their cultivated land sustainable.

Implementation of BBF and Zero Tillage Technology: This ensuing kharif season 2022, the BBF in Soybean, and Zero tillage technology in cotton will be implemented as reported by Agriculture Assistant.

Sericulture unit: In this village, about 57 sericulture units are working effectively and the farmers are earning very high net return. When all government officials and consultants visited one of sericulture units supported/financed though PoCRA project to Shri Sachin Abhiman Kharwade, Rs 2.93 lakh was given for construction of sericulture unit and rest of the items, required for this unit was provided by the farmer himself. He reported that about Rs 4.00 lakh is required to create 20 ft x 50 ft size rearing house. The following infrastructure for rearing of the silkworm from insect stage to silk cocoon is described for reference.

Rearing of silk worm: For completing one cycle of rearing , about 1.5 lakh silk worms are required. The total cost of the worms comes to about Rs 4500, other cost like insecticides and labour cost comes to Rs 7500. As per his version, the total expenditure for one rearing cycle comes to Rs 12000. After 22 days of rearing silkworm in this unit, the farmer harvest 1.5q of cocoon and sell to the retailor/traders at Rs 80000/q, earning gross return to the extent of Rs 1,20,000 and net return Rs 108,000. The same farmer completes six cycle of rearing this silkworm and earnng Rs 6,48,000 annually, provided the mulberry plants are available with the farmers for feeding green leaves to the silkworm.

Mulberry plantation: The same farmer has planted mulberry stem stock in 3 acre of his own land and also constructed farm pond of size 30mx30mx3m through PoCRA project, however the lining of the farm pond has been done by his own resources. Since the available water is limited and he is growing mulberry for sericulture throughout the year, ample amount of water is needed to supply mulberry leaves throughout. He has also purchased drip system and is irrigating plant at 15 days interval, however he is not following the irrigation scheduling criteria and amount of irrigation applied to the crop properly. The irrigation water calculation explained in details of water needs of the crop at specific days interval has been given in this report.

Figure 6.6 Silkworm rearing house and Mulberry plantation under drip irrigation system

Besides this sericulture enterprise, the farmers of this village are doing onion seed production on large scale basis and providing their produced certified seeds to the registered seed company and earning substantial money. One of the farmers, Mrs. Rukmini Chagan Ghatge, from her 0.8 ha area, harvested 8 quintal certified

seeds, sold to one of the seed companies at Rs 50,000 per quintal and earned gross income of Rs 4,00,000 from this cultivated area.

Horticulture and Agroforestry Activities : In horticulture/plantation area of sweet lime which is 4 years old, one of the farmers has grown chilli, ground nut and onion under drip in combination with sprinkler irrigation till the fully canopy is developed. He is generating additional income from the intercrops grown in sweet lime field. He has not elaborated the expenditure details and the net income generated from this enterprises.

Recommendations/Suggestions

1. Since the electric supply is highly irregular, provision of solar pump be made available from PoCRA or any other central govt. schemes. 5 Hp Solar operated pump may be made available as 3 Hp pump never supports the use of sprinkler irrigation with 8 riser.
2. Provision of electric pump to the eligible beneficiaries may be given.
3. More number of sericulture unit may be given in Georai Tehsil (Beed district) as the farmers are highly trained. The marketing network is also very effective. More subsidy (about Rs 4.00 lakh) may be given for construction of silkworm rearing house.
4. Creation of Community Farm pond in Georai Tehsil.
5. Fencing provision may be made towards surrounding of farm pond to avoid entrance of stray cattle and wild animals particularly during summer season.
6. Live fencing in individual farm area.
7. Shade net unit should be of 0.50 acre area instead of 1 acre as the marginal farmers cannot afford to bear their cost share.
8. Farm Producing Company on Gur preparation from sugarcane, marketing may be introduced as sugarcane in Georai block is dominated due to irrigation supply from Jayakwadi irrigation project. They are harvesting 130-140 tonnes/ha.
9. Major part of the district is underlain by Deccan Trap Basalt, where only dug wells are the most feasible structures for ground water development.
10. The overall stage of ground water development of the Beed district is 50.98%, thus there is a scope for further development of ground water resources particularly in all the talukas.
11. The existing dug wells may also be used for artificial recharge of ground water provided source water is free of silt and dissolved impurities/toxic elements.
12. The existing village ponds/tanks need to be rejuvenated to act both as water conservation and artificial recharge structures.

6.12.2. Agrieconomy

During the last week of January, 2022, two villages namely Chichardgaon, Taluka Vaijapur in Aurangabad and Rui, Taluka Georai in Beed district were visited by agro-economist Dr. Dalbir Singh. The purpose of the visit was to (i) assess the changes in economic conditions in terms of land ownership, patterns of income and consumption expenditure, saving and investments among beneficiaries, (ii) examine the strategies followed by the beneficiaries for strengthening input supply chain and marketing of farm produce (iii) access to credit institutions.

The participatory approaches such as group discussion, interaction with the project implementation staff at field level and senior management staff were followed to collect the required information regarding impact of project activities at ground level and problems in project implementation.

1. Varying natural resource base and implementation of project activities

Under the provisions of PoCRA, certain activities were planned and implemented across the villages keeping in view the available natural resources and requirement of the farmers. In these two villages, about twelve types of activities were implemented (Table 5). It is also noticed that there exist wide variations in the implementation of the activities across the villages. It can be stated that these variations were because of variations in the natural resource base as in village Chichrgaon, there exist variations in water resource and the farming were more concerned with the water conservation storing based activities. Hence, requirement and practice of installing of water ponds was larger as compared to Rui village. The status of water, both ground and surface was considerable as compared to that of Chichardgaon. Rui village was located in the canal command area. In water scarce village, the activities like drip irrigation farm ponds and the PVC pipes occupy considerable position as compared to that of Rui, known as water endowed village. There are substantial number of shade nets. In water endowed village, people were least concerned with the shade net activities. In Rui village, the farmers preferred to shift from traditional cropping pattern to other commercial activities like sericulture. There are enough sources for feeding silkworms. The households in the project area

also benefited from equipment like motor pumps and PVC pipes. The horticultural activities were also implemented in this village. Largely, the sericulture activities were preferred by the farmers. It was found that some of the farmers have shifted from traditional cropping system to sericulture[15]. The farmers reported that since more than a decade, the farming of sericulture is going on. But in recent years, this enterprise expanded considerably because of its economic viability. Therefore, it can be stated that the demonstration effects have contributed a lot in scaling up this activity.

The groups of farmers also reported that some of the activities under the project have been closed down, while they have legalised the importance of these activities in efficient farm operations. It was found that keeping in view the farmers' interest such activities should restart and new activities can be initiated such as solar initiatives[16]. In case of close down of certain activities in the project area, farmers were of the view that a uniform decision is not a rational decision of the concerned authority. Some of the knowledgeable and progressive farmers reported and suggested that to deal with certain irregularities in programme implementation, a proper and effective monitoring can be initiated rather than closing down the activities. This decision has affected some interest of farmers.

Table 6.49 Details of activities Implemented in the project villages

Activities	Chichardgaon Aurangabad District.	Rui Beed District
Sprinkler	118	6
Drip	82	117
Farm Ponds	32	12
Farm Ponds Individual	4	21
BBF	0	2
FFS	0	9
PVC Pipes	34	43
Motor Pumps (Well)	14	29
Horticulture	15	45
Sericulture	11	57
Shade Net	15	1
Small Ruminats	5	0
All	414	342

Source: From the record relating to project implementations

It is found that some of the activities like lining of nalas have given desirable results especially in recharging the aquifer that further expected outcomes as improvement in reliability of water sources.

[15] *It was noted during the interaction with groups of farmers. They reported that sericulture activities were economically viable as compared to other activities. This can be verified from the fact that as per the available project record there were about 57 households were following sericulture. But ground a reality shows that there more than one hundred households were associated with sericulture enterprises. They reported that this activity has been scaled up as experienced and leaning from other sericulture farmers.*

[16] *In Chichadgaon village, about 4-5 famers were benefitted with installation of Solar energy system through other government scheme that proved one the viable intervention as an alternative of energy requirement.*

1. Impact of PoCRA on Land Ownership and Economic Conditions of the Target Groups

In the present section, an attempt has been made to understand the impact of PoCRA on land ownership and economic conditions of the households in project areas. As per the guidelines of the project, only marginal and small famers were eligible for getting the expected benefits of programs. The farmers experienced substantial benefits from project intervention. Hence, they worked out the way to be eligible for the same. To understand the facts, efforts have been made to analyse the agriculture census data at village level. The information relating to changes in land holdings was considered before and after the project intervention. The analysis shows that the land ownership is not only changing due to the project intervention but also due to other institutional factors. But, the fact reveals that in case of marginal and small farmers, the PoCRA intervention is responsible to some extent along with other institutional factors like inheritance property rights. In certain cases, negative change in the operational holdings has emerged that can be because of the inheritance property right. It shows that there is no addition in the size of holdings.

To be eligible for getting the benefits of the program, the households have changed the land ownership within the households through division of land in the name of females. There are substantial changes in the land ownership in case of females (Table 2). In certain project villages, a considerable change can be noticed[17]. Interestingly, similar changes can be noticed in cases other than marginal and small farm sizes. It shows that resource rich farmers have added land holding. It can be through purchasing of land and other regions. In case of these farm sizes, the land has been named in the name of females. There are certain financial concessions during land registration in the name of females[18].

Table 6.50 Changes in land ownership before and after the project

Categories of Farms	Before the Project			After the project			Proportionate (Percent) Change	
	Number of Holding	Distribution Of Holdings	Average Size of Holdings	Number of Holding	Distribution Of Holdings	Average Size of Holdings	No. of Holdings	Area
	Overall							
Marginal	51.40	19.79	0.51	57.31	19.97	0.41	29.45	3.10
Small	30.06	32.08	1.42	25.92	30.07	1.36	0.10	-4.19
S-Medium	14.43	29.01	2.67	12.95	30.08	2.67	4.20	5.95
Medium	3.88	15.98	5.48	3.61	17.09	5.54	8.00	9.26
Large	0.23	3.13	18.07	0.21	2.78	15.86	3.53	-9.16
Overall (No.)	474	630	1.33	550	643	1.17	16.09	2.19
	Female Farmers							
Marginal	59.19	27.54	0.50	64.10	27.16	0.40	118.36	74.69
Small	28.85	37.49	1.39	24.35	35.39	1.39	70.18	67.25
S-Medium	9.94	23.85	2.57	9.61	25.81	2.53	94.83	91.73
Medium	1.89	9.43	5.34	1.86	10.49	5.31	98.03	96.91
Large	Neg.	1.68	15.15	Neg.	1.15	13.91	35.82	21.48

[17] See the Monitoring and Evaluation report of PoCRA, 5th Round

[18] As per the provisions, there are certain financial concessions in land registration in the name of females. These provisions were framed by different state governments with a view of women empowerment.

Categories of Farms	Before the Project			After the project			Proportionate (Percent) Change	
	Number of Holding	Distribution Of Holdings	Average Size of Holdings	Number of Holding	Distribution Of Holdings	Average Size of Holdings	No. of Holdings	Area
Overall (No.)	41	44	1.07	83	78	0.94	101.63	77.16

Source: Worked on the basis on Agricultural Census and discussion with the Farmer' Community.

Changing Living Style of the Target Groups

Asset ownership is one of the indicators of assessing the living style of the households. In this context, an attempt has been made to understand status of assets and social services before the project intervention and assets created after the intervention. The assets include construction of pucca houses, purchase of land, means of transportation and agricultural implements.

The field investigation reveals that there was a considerable expansion in the household assets after the project intervention. Before the project, only about 15 percent of the beneficiaries had the pucca house and after the project, about 90 percent of them have been given priority for the construction of pucca houses.

Interestingly, some of the farmers in limited proportion i.e. about two percent have created land assets within the villages. Often, farmers focus on agriculture sector with a view to increase agriculture production considerably. They purchase two types of implements – major and minor. These implements are necessary for accomplishing the different farm operation. Before the PoCRA implementation about 17 percent of the farmers were having minor implements especially that are used in present and improved farm practices. But after the implementation, largely the farmers i.e. 96 percent have purchased the required implements. The major implements include tractor and tractor driven implements, and pump-sets. More than one-third farmers i.e. 35 percent have major implements that are required for major farm operations. The availability and access to the transportation facilities make the villagers comfortable and improve the working efficiency. Here, we are talking about the four wheelers and two wheelers. There was a negligible proportion of the beneficiaries having four wheelers (Table 3). After the completion of three years of project implementation, nearly 3 percent of them were having four wheelers. But, there was a substantial expansion in the proportion of the beneficiaries having two wheelers i.e. 96 percent[19]. It shows that project has contributed a lot in improving the household income considerably. It can also be inferred that households/beneficiaries use/invest in improving the living style and scaling up the farm based activities.

Table 6.51 Status of household assets in the selected villages

Particulars	Proportionate Distribution of Assets	
	Before the Project	After the project
Household assets		
Construction of House	15.2	89.67
Land	0	1.74
Agriculture Implements		
Minor	16.8	95.79
Major	1.51	35.2
Transportation Facilities		
Four Wheels	0.11	2.6
Two Wheels	9.15	90.85

Source: Focus Group Discussion with the Farmers.

Role of the PoCRA in the lives of Women Headed Households: Case Studies

Women, particularly women-headed households, are considered as a vulnerable section of the society as they have to not only accomplish activities within the households but also manage livelihoods. In such scenarios,

[19] These information and facts were emerged during the discussion of with group of farmers, representative of PRIs, project implementation staff.

development project like PoCRA can play an important role in socio-economic upliftment of vulnerable groups like women. In this regard, an attempt has been made to understand the performance of project interventions in the lives of women-headed households through conducting case studies.

1. Case Study: Chichadgaon Village

In Chichadgaon village, Ms. Maya Bag is heading her household since the last 15 years after the demise of her husband. She has three kids, two sons and a daughter, who are all grown up and farming their own land of 1.21 hectare. The daughter has gotten married. She is linked with PoCRA activities like sprinkler, drip irrigation and pump-set. She reported that before the project intervention, her source of livelihood was wage employment on other's farms and MNREGA. She was also burdened with indebtedness from money lenders. She reported that PoCRA intervention has absolutely changed her life. After the project intervention, the household income has increased substantially, i.e. more than three times. As the household income increased, her living style has also changed considerably. It is noted that after considerable household savings, she constructed a residential house (Pic I) and installed storage facilities (Pic II) at the farm[20]. She also reported that the wedding of her daughter was held recently. At present, she has loan of amount of around Rs 60,000 from formal institutions like commercial banks. She also reported that initially there was a bundle of challenges related to livelihood which resolved after the PoCRA implementation. Her two sons also engaged in agriculture activities and engaged in commercial crop cultivation. She also told that in the absence PoCRA, her life would have been miserable and full of struggle. At present, her lifestyle is more comfortable rather than before.

Figure 6.7 Discussion with women who are heading households in Chichardgaon village, Aurangabad district

[20] Ms. Maya Bag, availed the help in constructing storage facility under the government scheme known as kusum Yojana.

2. Case Study II: Rui Village

In Rui village, Ms. Khushivarti has been heading the household for a long time, since her husband started business in the city. She is linked with the PoCRA activities such as sericulture, drip and farm pond. The household owns land of 1.21 hectare. Before the project intervention, the traditional cropping pattern such as cotton, wheat, Juar and Tur was followed by the farmers. Due to absence of assured irrigation, the crop production was not viable. After the project intervention, the cropping pattern was replaced by single crop i.e. sericulture. It was reported that keeping in view the viability of sericulture farming, she has taken the decision to replace the traditional crops with sericulture[21]. It shows that when the crop cultivation is not found profitable, the farmers avoid such crop cultivation (Pic. I). She also reported that uncertain markets for traditional crops are also one major reason of such shift. Further, she reported that saving from sericulture farming was reinvested on farm operations. She has given the first preference to education and construction of house (Pic. II). Her son is pursuing MBBS degree. She also initiated house construction on farm site rather than within the village.

Simultaneously, a discussion was also held with some women labourers deployed on the farm. They reported that PoCRA has played an important role in generating employment opportunities for landless households. They expressed that there is doubt that gender variations exit in wage rate. But there is availability of long-term employment opportunities within the village or in adjacent village. She reported that not only farmers but labourers' livelihood issues have also been resolved considerably.

Figure 6.8 Discussion with Women heading households in Rui village, Beed District

[21] Ms. Khushvarti, reported that experienced taken from the other farmers within and adjacent village she took the decision to follow the sericulture enterprises. Hence, demonstration effect has played a crucial role crop/ enterprises diversification.

3. Marketing Strategies

This section deals with the strategies followed by the farmers to sell the farm produce at remunerative prices. It was found that formal agriculture marketing facilities were missing near the villages. The facilities were available at a distance of 15-30 km that involve high transportation cost that resulted in minimising the farmers' profits. To understand the market margin received by the farmers, selected crops were considered for in-depth verifications. During the discussion, only those crops were considered, which have markets nearby the villages. About six crops were considered including wheat, juari, maize, soyabeen and pulses including tur and moog.

With certain exception of soyabeen production, the farmers failed to yield expected benefits in the prevailing marketing system. They were not satisfied with the auction at prevailing price for various farm products. It is noted that the farmers were better off in case of soyabeen crop that was economically viable. In case of other crops, they were facing losses at varying rates. The losses were substantial in case of moong with 55 percent followed by juari (small millets) crop and wheat crop production (Table 6.52). The gap was very limited in case of tur. The farmers expressed their concern that it was their compulsion to accept lower offered price for marketable produce. They also face the challenges in prevailing marketing system especially without MSP. In case of other crops like vegetables and fruit, there was no assured price mechanism and they have to manage accordingly. There are various types of risks and uncertainties that hamper the expected benefits to the farmers.

Table 6.52 Gaps between minimum support price attained by the farmers

Crops	MSP (Rs/Qtl)	Price Attained (Rs/Qtl)	Difference	Proportionate Difference
Wheat	1975	1736	-239	-13.77
Juari	2758	1883	-875	-46.44
Maize	1860	1755	-105	-5.96
Soyabeen	3950	6078	2128	35.01
Tur	6150	5867	-283	-4.83
Moong	7275	4667	-2608	-55.88

Source: CACP, Project records and discussion with the Farmers.

The price variations are dictated by seasonal variations and nature of demand for and supply of farm produce. To deal with such challenges, availability of storage facilities is important. With the help of project interventions the households have access to such facilities. Presently, the villages have the average capacity of about 5 to 7 thousand metric tonnes capacity storage facilities. At the farm level average capacity of storage structures was 40 to 50 tonnes (Pics. I&II).

It was observed as well as reported by the groups of farmers that storage facilities were available at the village levels. But, there is a lot of work to be done relating to storage activities. It was also noted that some of the progressive farmers have also installed these facilities to deal with price fluctuations and getting remunerative prices of the farm products.

Figure 6.9 Storage facilities in Chichadgaon in Aurangabad district

In the absence of efficient marketing facilities, the farmers diversify towards such farm practices that could be viable and efficiently market-oriented. The farmers experienced that sericulture enterprise is more profitable and has an assured market that resulted faster shift towards this enterprise in Rui village. There is no problem in marketing of sericulture products.

The concept of value chain is still missing in the project area. After the intervention in providing storage facilities under other government schemes, the problem is still going on. There is need to give due attention to resolve the problem relating to storage facilities, only then the concept of value chain can be initiated.

4. Access to Credit Institutions

Access to the credit facilities is one of the indicators of success of the development projects. In the present context, an attempt has been made to identify the different credit institutions and their performance in the implementation of PoCRA activities.

Formal Credit Institutions: Commercial banks and cooperative societies can be treated as formal credit institutions. These institutions are the major source of loan to the farmers. The field investigation reveals that slightly more than three-fourth of the total beneficiaries have taken loan from the banks. The main purpose of the loan was farm operations followed by education purposes. More than one-third of them have taken loan from the banks for higher education. It shows that village communities are more concerned with higher education. About 8 percent of beneficiaries have taken loan for other purposes such as business and so on. The role of cooperative societies was found as limited as compared to that of commercial banks. It was because of the fact that cooperatives charge higher rate of interest. Hence, the farmers avoid loan from these societies. These societies provide loan for agriculture purpose that is known as crop loan (Table 6.53).

Informal Credit Institutions: The informal credit institutions include money lenders, friends and relatives. In certain cases, these informal institutions play an important role in providing loan to the individuals in easy ways without accomplishing any formalities. But, there is no any fixed limit on the rate of interest. It can either be exceptionally high or negligibly low as compared to that of formal institutions. It depends on the social cohesiveness among the institutions and loaners. It is found during the discussion that over a period of time, the role of money lenders has been reduced substantially[22]. It is because of the growing role of formal institutions. These institutions provide loan to the individuals for multiple purposes.

Table 6.53 Source-wise usage of loan facilities by the beneficiaries in the selected villages

	Total Beneficiaries	Proportion of Loaned Household	Agriculture	Education	Social cerem-onies	Health	Other
Banks	625	75.76	88.00	34.40	0.00	0.00	7.52
Cooperatives	95	11.52	100.00	0.00	0.00	0.00	0.00
Village Committees	460	55.76	81.52	13.48	4.35	0.65	6.52
Friends and Relatives	135	16.36	74.07	3.70	11.11	2.22	18.52
Money Lenders	50	6.06	30.00	16.00	36.00	10.00	34.29
Overall	825	75.76	83.15	9.30	4.10	1.03	8.64

Source: Discussion with group of farmers in the different villages

Emergence of New Informal Credit Institutions: It has been observed that after the project implementation, the farmers' demand for money has increased considerably. As per the provisions of PoCRA, the farmers would have to invest from his/her sources in different activities. Generally, inadequacy of financial resources with the beneficiaries was noticed. To meet the credit requirements, the households established alternative financial institutions known as Village Committees (VCs). The members can contribute their share monthly as per the collective decision of the committee. After a month, the needy household/individual is allowed to avail the committee and can meet the financial requirement as per the framed norms[23]. Such informal institutions

[22] The villagers reported that there is sharp decrease in the role of money lender in the rural economy. It is experienced that they charge high rate of interest from loaners. Hence, they keep the resource poor individual in their clutched. As the household income increased, they give limited importance to local money lenders.

[23] In the villages, about eight to ten even more such committees were constituted. Social relationship and undemandings among the members are the basis of committee formation. The committees have framed certain rule and regulations for efficient functioning.

were found as 8 to 10 and even more. It is observed that in every month a transaction of Rs. 10 to 12 lakhs was done. The household/individual can use this amount for different purposes. These informal institutions were proved as efficient and self-sustained sources of credit[24].

Other Issues

Besides, aforementioned issues raised and discussed, there are some other issues and challenges that emerged during the discussion. The farmers pointed out that damage to the crops by wildlife is one of the major challenges. The farmers reported that a quantum of agriculture production is damaged due to this during every season. They demanded certain effective measures to protect the crops.

5. Concluding Observations

The present sections deals with observations that emerged for the field investigation. Certainly, these observations give some insights that may be helpful in making the program more efficient.

(i) Need for Policy Review: Keeping in view the farmers' interest and growing demand for restarting certain project activities that are closed down, it is realised that there is a need to review the existing policies. The farmer community proposes that to restrict certain irregularities, effective monitoring at various levels should be initiated. Hence, there is a need for certain institutional reforms which can be useful in supporting project activities.

(ii) Sustainability Issue: Sustainability is a crucial issue in PoCRA intervention. Certain activities such as lining of nalas have played an important role in resource conservation and regeneration in the project villages. Interestingly, in Rui village, farmers were avoiding the water intensive crops like sugarcane to less water consuming crops. But, the farming communities were more concerned with the economic viability of crop cultivation rather than optimality of resource use. Certainly, it needs certain technological options and institutional reforms like strengthening of capacity building programs.

(iii) Attitudinal Change among the Communities: It is observed that an attitudinal change has been taken place among the communities. As the household income changed, similarly, consumption, saving and investment have also changed during three years of project implementation. People's behaviour towards other has been observed as cooperative. The cohesiveness among the communities, representatives of democratic institutions like PRIs and communities, and various departments of the state government have been strengthened.

(iv) Expansion in Numbers of Women Farmers: The in-depth analysis of village agriculture, Census and interaction with both men and women farmers, representatives of PRIs and government departments reveals there is substantial expansion in the numbers of women farmers. Such change in land ownership has taken place to be eligible for attaining the benefits of PoCRA and some inheritance property rights. It gives the reflection of women empowerment at grassroots level.

(v) Expansion in Household Assets: The analysis shows that there is a considerable change in household assets that determine the living style of the beneficiaries. There is a substantial expansion in household income. The households were found to be more interested in reinvesting in agricultural activities on own farms followed by construction of houses and storing facilities. The farmers also give due importance to quality education among children[25].

(vi) Role of Credit Institutions: In the project villages both types of credit institutions were performing efficiently. The farmers were more dependent on formal institutions like commercial banks and cooperative societies. The importance of informal institutions is still noticeable in the rural setting but in limited proportion.

[24] It is emeged during the discussion with different groups of the farmers and project implementation staff deployed in the villages.

[25] See Mid-Term Monitoring and Evaluation Report, PoCRA.

Interestingly, another type of informal credit institution has emerged, known as village committee that is functioning efficiently as they were organised and are working with active participation of members.

6.12.3. Agribusiness Observations and diagnosis of Farmer Producer Organization/Self Help Groups/Farmer Groups

A visit to one FPOs and three Farmer groups were done in the month of February 2022. Based on discussion and observation during the visit this observation report is prepared.

1. Production

This gives a description of the production side of the organization, including the membership base, the product and the services offered to the external and internal clients.

Table 6.54 Shareholders of the producer company/ self help group/ farmer group

Name of the company/Self Help Group/Farmer Group	General Details	Major Products	Services
Lamkana Farmer Producer Company, Lamkana, Naigavan, Aurangabad	Registered in 2018	Running Krushi Sewa Kendra (Wholesale and retail of Pesticide, Fertilizer, Seed and Organic manure)	● Mandi licence yet to be taken ● Input services only ● Farm machinery
Baliraja Swayam Sahayata Shetkari Gath, Chinchadgaon, Vaizapur, Aurangabad	Formed in 2020	Cotton and Onion	● Farm machinery
Shri Swami Samarth Swayam Sahayata Shetkari Gath Chinchadgaon, Vaizapur, Aurangabad	Formed in 2020	Cotton and Onion	● Farm machinery
Gawli baba Resham Udyog Shetkari Gath Golwadi, Dahegaon, Vaizapur, Aurangabad	Formed in 2020	Capsicum and Chilli	● Farm machinery

2. Internal Organization

Name of the FPO	Governance and Management	Staff Strength/Remarks
Lamkana Farmer Producer Company, Lamkana, Naigavan, Aurangabad	11 Directors 9 (8 Male and 3 Females) 500 members 300 farmers have paid membership fee of INR 1000 and 200 have paid just INR 200.	○ One CEO ○ Accountant ○ Field executive -2 ○ Part-time employees as per need
Baliraja Swayam Sahayata Shetkari Gath,	11 members - 6 male and 5 female	Machinery bank includes: Tractor, Trolley, Rotavator, Seed Drill, Turning plough, Chaff cutter

Chinchadgaon, Vaizapur, Aurangabad		
Shri Swami Samarth Swayam Sahayata Shetkari Gath Chinchadgaon, Vaizapur, Aurangabad	11 members - 6 male and 5 female	Machinery bank includes: Tractor, Trolley, Rotavator, Seed Drill, Turning plough, Chaff cutter
Gawli baba Resham Udyog Shetkari Gath Golwadi, Dahegaon, Vaizapur, Aurangabad	11 members - 9 male and 2 female	Machinery bank includes: Tractor, Trolley, Rotavator, Seed Drill, Turning plough, Chaff cutter

Governance and Management

The FPO is governed by a board and farmer group being a small group is governed by members. The board/members meets every month to discuss various activities related to production, procurement, finance, loan and repayment. It was observed that the board members were well versed with legal and statutory requirements. It was noticed that the board members understand the role of FPO in delivering better services and they are aware that the FPO belongs to all of them.

Members of FPO and Farmer group take the social responsibility and try to control inebriation and dowry in the village. It was very interesting to note that no child marriage or case of domestic violence was reported in the villages of project intervention.

Farmers and members have very good understanding of crop production and impact of climate change on production systems. Farmers have selected a few duration and resistance specific varieties to adapt to climate change. Farmers have also adopted conservation practices to conserve natural resources specially water. Farm ponds are full of water and informal water distribution mechanism is in place. No case of dispute was reported during the visit.

Shade net houses have created an inspiring opportunity for younger farmers in the village. A 21 year old farmer Ratan Madan Dharwade from village Golwadi, Vaizapur stated - “Although I am persuing my studies, I am cultivating capsicum in shade net. I would prefer to continue farming even after completing my studies because here I see the future.” Shade net intervention has inspired youngsters so much that a younger brother of a farmer said he would like to put his 2 acre land under shade net and cultivate capsicum before getting married.

The farmers are using the increased income for building assets at farm or household level, and for education of children and health of elderly.

Staff Strength

The current organization structure has weakly defined roles and responsibilities. The current performance appraisal system of the staff at the FPO was not found scientific.

The office of the FPO/group is located at the village which is good for operation management. The capacity of staff related to key business functions is yet to be developed.

3. Capital and Finance

Lamkana Farmer Producer Company: The company started in 2018. Directors pooled 35 Lakh to start the company. Initially, they constructed a shop and godown to start the business of agri-input. In the year 2018-19, the turn over was 25 lakh which grew to a level of 45 Lakh in 2019-20, 65 Lakh in 2020-21 and 1.0 Cr in 2021-22 till June.

The company has submitted the proposal to the Government for food processing unit. The total project cost is INR 3.34 Cr. For this project, the company has applied for bank loan of INR 1.25 Cr. The company spent around INR 65000/- for developing the proposal. The company will process Tomato, Papaya and Pomegranate. At present the company is encouraging their members to establish Pomegranate orchard to ensure the supply of raw material for their future investment. The company is helping members get good quality saplings from reliable suppliers having details of genetic material and technical knowledge for establishing orchard.

Farmer groups are mainly engaged in machinery rental business. Initially there were only one or two machinery groups in the villages and they used to get a lot of work in the season, but now there are only 9 machinery banks in the villages that lead to increased competition and revenue.

4. Long Term Perspective

The FPOs' long term strategic plan is clear to the staff and board members. They all agree to make the FPO into a profit making organization. They have a production plan at the beginning of the year and they revise the plan as per need. They don't have scenario analysis for their business.

5. Accountability and Transparency

The accounts are computerised and it is known to the CEOs and staff. The cheques are being singed by the director and the CEO for the clearance. The financial situation is also a discussion point at the governing body meeting. The members of the FPO have immense trust and respect for the FPO staff and PoCRA. The major decisions are taken by the staff and known to all the board members of the FPO.

6. Monitoring and Evaluation Systems

The FPO has learnt the process for effective monitoring. They feel the current system needs to be revamped with a scientific plan as it is becoming increasingly difficult to manage the increasing business. The production planning, demand estimation and loan repayments need to be automated to the higher extent.

7. Risk Management

The FPO doesn't have a clear understanding of risks related to its business and operations. The FPO realized the importance of identification of risks, their impact on the organization and strategies to mitigate them. They appreciate the idea of implementing the risk management matrix.

Farmer group has identified their business risk. Establishment of more than 2 or 3 farm machinery bank in the same village may lead to competition and finally decline in the revenue earned by each group. The members are not sure how to manage this challenge as different government departments are coming up with schemes and more and more number of machinery banks are coming into existence.

8. Linkages and Sustained Support

The FPO/farmer group members reported good relationship with the PoCRA and government. Farmer groups have established good linkages with buyers to sell their farm produce but they want to explore possibility of institutional partnership at group or FPO level.

9. The relationships

The relationship of the FPO/farmer group with the members seems to be very good as they can access the technical inputs, machinery and farm inputs including saplings at fair price.

The FPO/farmer group has very good relationship with the PoCRA and they feel they need their support during their transition. FPO believe that PoCRA should be helping them in providing the legal and statutory support.

FPO/members have good relationships with government functionaries too.

10. Social and Environmental Aspects

Gender and Inclusive Growth

The FPO works with mostly small farmers cultivating priority products of the FPO. There is no clear policy for gender inclusion but members seem open to including women farmers as members of their FPO.

Environment and Sustainability

The members understand very well the impact of climate change and are helping their members to adopt climate resilient technologies and practices. FPO/members understand the benefit of organic and natural products and are promoting less chemical farming to reduce environmental pollution and sustainable farming.

Fair Trade Practices

The members, the promoters, staff and the governing body are very much aware that children need to go to school and hence no child labour is used in production or harvesting of pomegranate crop. FPO is encouraging its members to register for government pension and insurance schemes.

11. Strengths and Challenges of FPOs

As a result of detailed discussions and deliberations, the following strengths and challenges were identified.

Strengths of FPOs

- FPO has very good relationship with buyers, members, and government.
- The FPO staff and BOD members are well informed in technicalities of FPO management and standard POP is available to all members.
- The business processes are defined and adequate infrastructure is in place
- Staff is young and want to experiment with new ideas
- FPO and members engage with community on social and environmental issues

Challenges of FPOs

- Long term business strategies and operational plans have to be developed at the FPO along with the board and staff
- Organization structure needs to be defined with clear job description and appraisal systems
- The primary business of the FPO is agriculture or allied activities and hence risk analysis and mitigation plan needs to be in place
- The FPO's dependency on market will increase as they scale up hence the business model around them is not very clear to the staff and BOD
- Capacity of the governing board needs to be developed in terms of understanding their roles and responsibilities, businesses, finances, production, marketing and other operational issues
- Risk assessment and mitigation strategies need to be developed by the FPO
- The benchmark of efficiency for each of the business process need to defined and milestone-based approach needs to be followed by staff and management team

12. Recommendations

The following aspects are important for the FPO to scale up its business. We can prioritize the needs through mutual discussions for implementation and evaluation

- Vision and Mission building exercise for BOD and staff
- Design of organization structure and performance appraisal system
- Legal and statutory assistance
- Business process analysis and benchmarking
- Business plan formulation
  - Defining product basket
  - Production planning
  - Procurement plan
  - Working capital and loan management
  - Sales and revenue
  - Risk assessment matrix

- MIS
  - Production planning
  - Demand estimation
  - Production estimation
  - Accounts, payments, and receipts
  - Finance and loan management
  - Distribution and supply chain
  - Statutory and legal requirements
  - KPIs, ratios, and M&E

- Capacity building of Staff and BOD
  - Business management
  - Production, operations and efficiency related

The SIYB (Start and Improve Your Business) training for Board and top management team is recommended.

- The SIYB programme (conceptualized and implemented by ILO) is structured into four separate training packages, which are designed to respond to the progressive stages of business development.

  Generate Your Business Idea (GYB) is intended for people who would like to start a business, and who, through the training, develop a concrete business idea ready for implementation.

  Start Your Business (SYB) is for potential entrepreneurs who want to start a small business and already have a concrete business idea. The programme is a combination of training, field work and after-training support, and helps participants assess their readiness to start a business and to prepare a business plan and evaluate its viability.

  Improve Your Business (IYB) introduces already practising entrepreneurs to good principles of business management. Its six modules (marketing, costing, buying and stock control, record keeping, planning for your business, and people and productivity) can be taught individually or all combined in a full course.

  Expand Your Business (EYB) enables growth-oriented small enterprises to develop a business growth strategy through training interventions.

  The SYB and IYB packages also include the SIYB Business Game, a practical simulation tool to help participants understand the realities of starting and running a business. The EYB Business Game simulates an expanding business during training to help participants experience the impact of strategic decisions on their business operations.
- The GYB and SYB package may not be relevant for the FPO/farmer groups who have already started business but rest of the modules can be used for training.

Note: Farmers are demanding storage structure for onion at individual level

13. Environment and GIS

A field visit was undertaken on 14 February 2022 and 15 February 2022 in the Aurangabad and Jalna districts. Four different villages were visited during the period. Two project villages were in Aurangabad and two were in Jalna.

Chinchadgaon village (19°52’19”N; 74°48’53”E) and Golwadi village (19°50’54”N; 75°16’31”E) in Vijapur Block of Aurangabad district were visited. Individual discussion with few beneficiary farmers and FPO members were undertaken. PoCRA project implementation sites were also visited in the village. Individual discussion was also undertaken with the husband of the Sarpanch of the village.

The village area of Chinchadgaon is about 1200 ha. There are 300 households in the village. Main kharif crop of the village are Cotton, Maize, Bajra and Chickpea. The Rabi crops are Onion and wheat. Nowadays some farmers are able to cultivate Maize and Bajra during the Rabi season due to the availability of water after the PoCRA activities in the village. 100-150 individual farm ponds and 22 shade nets were developed under PoCRA.

Earlier the total irrigated land in the village was 1 to 2 acre, but presently it is 5-6 acre due to different activities under PoCRA. Several farmers from the village have taken the drip and sprinkler irrigation system with PoCRA subsidy. Many people in the village are interested to undertake drip/sprinkler irrigation system, after looking at the benefits of the beneficiaries. Most of the beneficiaries have already cleared the loan amount they had initially adopted for the protective irrigation system or shade net development. Some of the beneficiaries with shade net looking for developing a second shade net with their own investment, after understanding the benefits of the shade net cultivation. Agriculture department and local pesticide shop owners generally help the farmers to identify the diseases or pest in the crop. They only suggest the required chemicals to protect the crops from disease and pest attacks. However, after getting trained from PoCRA, farmers are able to diagnose the disease and pests themselves. Beneficiary farmers have received training and have an understanding of climate resilient short duration crop varieties to sustain under the changing climatic conditions, but the farmers are reluctant to undertake new varieties and relies on the traditional crop varieties. On average, farmers of the village reported that the investment in agriculture land has increased during last 3 to 4 years, whereas yield has decreased. Cotton yield in the village has significantly decreased, earlier it was 16 to 18 q/acre; however, presently, it is 5 to 6 q/acre. Three to four times pesticide application is required for cotton cultivation.

Capsicum and cucumber are the major crops undertaken in shade nets. Different types of chemical pesticides are applied during the growing period of capsicum. Farmers suggested that they apply pesticide in the shade-net at 3 to 4 days interval regularly. Farmers believe that if there is less pesticide application than the above, then the crop growth and quality will decrease. Although there are sticky pads installed in the shade net, to check the intensity of pest, it was found that the farmer has no knowledge or understanding the sticky pad before applying the pesticide. INR 20 Lakh was spent by one of the farmers to develop shade net over 1 acre of land. The farmer has received subsidy of INR 14 Lakh from PoCRA. Two sons of the farmer, both are in their twenties, are taking care of the shade net. Both the son have got training from PoCRA on shade net. They have spent 1 lakh 6 thousand rupees for the capsicum plantation in the 1 acre shade net. They have got good profit from cucumber cultivation earlier in the shade net. This helped them to return the loan amount that they had borrowed from the bank for the construction of the shade net. They had burnt the wasted plastic mulch from the last crop in the shade net. However, they store the used plastic bottles of pesticide and sell the empty bottles to the garbage collector (Kawadiwala). However, no definite storage system of the empty bottles were noticed, rather the bottles were dumped here and there after use.

Figure 6.10 There is not enough number of pests on the sticky pad (yellow), but still the farmer spray pesticide at every three days interval. Picture on the right shows disposal of used plastic container of pesticides around the shade net.

Villagers reported that there is no problem of water after the PoCRA activities in the village, they have good number of water storage facilities in the village. They do fill the farm ponds with the well water during the month of January as the well starts to dry from March onwards. Villagers reported that they have the issue related to water lifting as there is scarcity of pumps and presently there is no subsidy for pumps under the PoCRA. They are also looking for subsidy for solar pump under the PoCRA to use water from the farm ponds. Labor is a major cost in the agricultural activities in the village. The labor cost for planting onion is 9 to 10 thousand/Acre. 10 people generally work for the plantation of onion in one acre land.

Two custom hiring centers were developed in the village under two Self Help Groups – i) Baliraja Sayam Sahayatu Shetkari Gat (Group) comprises 11 member and the SHG was formed in 2019; ii) Sri Swamy Samarth Sai Shetkari Gat (Group) comprises 15 member and the SHG was formed in 2020. Each got has male and female members as per requirement. The farmers' Gats were formed only due to involvement of PoCRA and agriculture officials in the area. The members of each Gat are from nearby agriculture lands. All the CHCs have at least one tractor and they use available diesel only as tractor fuel. Apart from tractors, there are trolley, cutting machine, rotavator, seed drill and plough in each CHCs. Both CHCs reported that onion storage facility is in demand in the area, but that is not available under the PoCRA. During the discussion it was found that the members of the CHC are not interested to improve their knowledge related to machine repairing, and are interested to increase the CHC activities if there is further subsidy scheme from the government. It was found that the women members of the VCRMC are not much active and generally not involved in any PoCRA related activities in the village. The husband of the Sarpanch, Mr. Kiran Tambe takes the major decisions in PoCRA activities.

There are 30 shade nets developed in the Golwadi village under the PoCRA. One of the shade net developed under the PoCRA were visited in the village. This was built over an area of 1 acre. The farmer had invested INR 18 lakh and had received 14 lakh subsidy amount from PoCRA within 3 months of completion of the construction. The farmer planted 11000 seedlings of capsicum in the Shade net last year and got about 4 lakh profit. After looking at the benefit of last year, he has undertaken capsicum this year too and is expecting a profit at the same scale. The farmer was found to spray chemical pesticide to the crop at every 3 days interval from the time of fruiting. He has four harvest of capsicum each season, with a total of 80 ton of capsicum harvested in each season. There is no problem of marketing of capsicum in the area. Residue burning is an

important problem in the area. Almost all farmers told that generally they burn the crop residues of cotton or used it for household energy for cooking. One Sericulture FPO has been developed in the village under PoCRA - Gawli Baba Resham Udyog Shetkari Gath. This FPO also has a farm machinery bank.

Figure 6.11 Gawli baba Resham Udyog Shetkari Gath developed under PoCRA in Golwadi village

In both villages, LPG connection is there in all households, but due to recent rise in LPG price most of the farmers have shifted to traditional biomass based cooking. However, farmers generally use crop residues as source of energy for the household food production even though they have LPG connections.

Sevli (19.824 N; 76.245E) and Shivni (19.790N; 76.192E) villages in the Jalna district were also visited during this time. Beneficiary farmers of shade net and drip irrigation were individually discussed in each village. One farmer in the Sevli village invested INR 8.5 lakh for 0.5 acre shade net. The shade net was approved by PoCRA in February 2021 after six months of application. This farmer was having experience in shade net earlier too. However, his earlier shade net was traditional, made up of normal mosquito net. Even after he was having earlier experience with shade net, the farmer has got traning for shade net operation under PoCRA. The farmer has undertaken seed development in the shade net. The farmer is presently undertaking marigold seed preparation. However, the farmer does not have any training on scientific pollination and follows traditional system of pollination. They have undertaken the flower seed preparation without any previous knowledge in floriculture. They are expecting 10-15 kg of seed production from the 0.5 acre shade net. The seed can be sold at a rate of INR 10000/Kg. The farmer has an individual 80ft well to support the water requirement for cultivation. The farmer has taken cucumber seed production during last season and has received a profit of INR 2 lakh. They sold the cucumber seed at INR 2200/Kg. They apply pesticide to the crop (both cucumber and marigold) at 3-4 days interval following suggestions from the seed company he is in contract with. The farmer applies ten different types of chemical pesticides. As the entire subsidy amount has not yet been paid to the contractor, the fogging system has not yet installed in the shade net.

Figure 6.12 (Left) Traditional shade net of beneficiary farmer and (Right) marigold cultivation in the PoCRA subsidized shade net.

Two other farmers have got sanction for the shade net but not yet started the construction activities. The

contractor for shade net in the village are constructing the shade net with some initial payment from the farmers and the farmer sign an agreement to pay entire subsidy amount to the contractor. These farmers have no idea about the VCRMC members and Krushi Tai of the village. They have got the knowledge of PoCRA benefits from the Cluster Assistant of the area. The farmer who is presently undertaking the marigold crop has already applied for another shade net in his brother's name. According to the farmer they have no choice except burning of the plastic mulch and empty plastic bottles of pesticides. They understand that if not burnt, these will affect the environment.

At the Shivni village, discussion was undertaken with a progressive farmer. The farmer family have undertaken three 1 acre shade nets under PoCRA. Two of the shade nets are already functional. They have undertaken watermelon and chilli in these shade nets. The irrigation water to the shade net are supplied from three farm ponds constructed under the MTS scheme. The farmer is well informed about the shade net and he also has got training from PoCRA related to shade net operation. The farmer has two other 1 acre shade nets lasting for 10 years. It was found that the farmer is well aware about the environmental damages caused by burning of plastic mulch, irrigation pipes and damaged nets. However, as there is no way of disposing these, he has dumped all these waste materials at one corner of their field. He also dumps the empty plastic containers of pesticides, but these containers are sold out annually to collectors.

Note. Dumping area of used plastic mulch, used nets and used pipes from the shade net in Shivni village.

At the Shivni village one beneficiary has taken drip irrigation pipes and installed that in his grape vine. The farmer suffered heavy loss related to grape selling due to COVID lockdown. According to the farmer, before the COVID period businessman used to buy the grape from his grape vine at INR 30/Kg; however, now very rarely people are coming to the grape vine and he needs to carry the products to nearest market (20 km distance in Jalna) to sell the produce at INR 20/Kg. The farmer said that he needs to spray chemical pesticide at one day interval to sustain the crop growth. The farmer had tried to undertake organic pesticide, but the grape vine was severely affected while using organic pesticide. The farmer said that the area was dry earlier, but with the PoCRA project the area has become "Sujalam and Sufalam".

Figure 6.13 Grape vine at Shivni village with subsidized drip water system under PoCRA.

Natural Resource Management construction activities have not been undertaken under PoCRA in any of the four villages.

Key observations

- People are happy with the very transparent implementation of the PoCRA project.
- All most all farmers reported that the PoCRA project has improved the water availability particularly in Rabi season.
- PoCRA project has increased crop yield in the area
- Indiscriminate chemical pesticide application is a major concern for all villages
- No soil sample analysis was undertaken in any of the visited villages under PoCRA; however, other contract farm has undertaken soil testing in these villages.
- Post-harvest crop residue and plastic waste disposal and burning are of important environmental concern in the area.

- Presence of VCRMC in the area is very limited, Krushi Tai of the villages visited in the Vijapur block has not received any training.
- Although VCRMC has representation of women members, but none of them were vocal. Sarpanch in two of the villages were women, but most of the discussions were undertaken by the husband of the sarpanch.
- It was noted that in most of the cases, the PoCRA benefits were taken by the "Progressive farmers'" or a family of farmers in these four villages.
- Some of the Self Help Groups are formed with the advice of the PoCRA cluster assistant, just to undertake the benefit of PoCRA activities like CHC, FPO etc.
- Some Self Help Groups are waiting for other government schemes to increase there business activities; However, some of the FPOs and CHCs are working very well with business plans, planning to undertake several other activities with the profits from the CHC or FPO developed under PoCRA.

14. Sociology

- Village visited –
  - Chinchadgaon, Dist Aurangabad
    - Total households - 250
- 215 households are from OBC communities, 30 belong to Muslims and the remaining are Christian households
- Agriculture and allied activities are the mainstay of economy
  - Main crops - pomegranate, citrus (sweet lime and lemon), capsicum, tomato and chili
- POCRA was implemented in 2019
- Method of data collection – FGDs/Key person interview
- Date of field visit – 9th March-10th March 2022
- Team – Mini

Performance of VCRMC (was formed in 2021)

- VCRMC meetings are conducted mostly once in a month. The main activities undertaken are – review of project progress, guidance to farmer regarding application for matching grant.
- Since the belt is involved in production of horticulture crops and off-season vegetables, majority of applications were in support of micro-irrigation systems (drip/sprinkler) and horticulture plantations.
- Nearly 300 farmers have submitted their application for micro-irrigation systems and around 100 farmers for farm ponds.
  - Funds have been disbursed to nearly 150 farmers for micro-irrigation and 40 farmers for farm pond
  - 80 farmers have received pre-sanction for sprinkler and 20 farmers for farm pond
  - Few farmers got micro-irrigation systems from shopkeepers on goodwill and the payment was made to them only after the disbursement
- Benefit of shade net was availed by 9 farmers. It is used for cultivation of capsicum, cucumber and melons
  - Farmers received training in Pune for 4 days regarding cultivation of crops in shade net
  - Although women actively participated in cultivation of vegetables, hey were excluded from training since they were not direct beneficiaries
- VCRMC is actively working to ensure women and marginalised are benefitted from the project
  - Around 7% of women have lands in their name and have received support for sprinkler
- Farmer cooperative group called - *Baliraja Swayam Salget Shetkari* availed benefit of tractor, trolley and chaff cutter from this project. They also constructed a shelter to keep tractor and implements. In total the group invested around 14 lakhs and got a subsidy of 8 lakhs.
  - The group has made profit by renting tractor and other implements to farmers/other group
    - Tractor is rented for Rs 2000 per acre for non-members and it is Rs 1500 for members.
- No major conflicts were reported amongst VCRMC members. Transparency was maintained and all activities/developments (pre-sanction, sanction, training etc.) were communicated to the beneficiary.

Inclusion of vulnerable groups (SC/ST/Women/marginal and small farmers)

- Composition of VCRMC was representative in nature with the mandated representations from SC/ST/marginal farmers, women farmers (4-5) and women SHG members. But the SHGs were not formed as part of POCRA.
- Women/marginalised VCRMC members' villages expressed that they actively participated in voicing their opinion during meeting (especially sanction of applications). They also regularly followed up on the application status. Women who owned lands had also received disbursement for sprinklers.
- All beneficiaries, especially the small and marginal farmers who had received disbursement for micro-irrigation (drip/sprinkler/pipes/pumps) expressed that they have benefited from these assets. These technologies have led to water conservation and also saved their crops during less water availability in any season.

Performance of Krushi Tai

- In this village, Krushi Tai was appointed in 2020 and has been drawing a monthly salary of Rs 500. The newly formed VCRMC retained her, and hence she is well aware of her role and responsibilities as an interface between project team and the marginalised (marginal/small farmers/women). She is active in raising awareness about project especially amongst women, urging women to attend meetings and motivating the community to apply and avail benefits of the program.
- Regularly undertake home visits and pass information about the proceeding of VCRMC meetings and also explain the application procedures
- Krushi Tai was not able to attend a recent on-line training program conducted by PoCRA due to connectivity issues.

Project supported women SHGs

- There are no project supported women SHGs in this village, although there are other SHGs which are actively functioning in the village for thrift and credit activities.
- However, women SHG members are also members of VCRMC as part of the mandate

Main benefits reported

- Shade net was identified as the most important benefit from the project. This has improved the productivity of capsicum and resulted in better profit margins.
- Women (including Krushi Tai) expressed that their overall confidence level increased after becoming VCRMC members.
- Farmers mentioned that beneficiaries of irrigation system development activities like sprinkler reported an increase in their farm yields

Overall challenges identified by beneficiaries

- From the past 6 months, there is a delay in disbursement of funds.
- Farmers are not able to mobilise institutional credit for upfront payment and they are not keen to take any credit from local money lenders. Most of the farmers also did not have any savings/cash in hand to avail benefits of the project.
- COVID lockdown affected capsicum growers badly; they were forced to sell their produce in the local market for a lower price. They were unable to recover their investment costs.

Suggestions given by beneficiaries/non-beneficiaries

- VCRMC should connect farmers with shopkeepers so that they can provide micro-irrigation systems to farmers on good-will and the farmers will the pay the shopkeeper when they get grant from PoCRA
- There is a demand for solar pumps in the region and hence the request from farmers for integration of this into the project component
- Solar fencing/wire fencing to protect from wild animals (wild monkeys/pigs/deer/wild boar)
- Due to lack of storage facilities for vegetables (especially onions), many a times farmers are forced to sell their produce to local vendors/middle person for a lower price. Hence, their request is for a common store house facility in the village.

- Common demand from the landless in all the villages is support for allied activities such as poultry, goat rearing and dairy, and these activities was stopped abruptly in 2020. The landless, women and marginal farmers are keen to take up this activity.

15. Towards Climate Resilience in Agriculture System – Case of Chinchadgaon Village

As suggested by PMU, in current round of concurrent monitoring, with an objective to bring insights of village progressing towards climate-resilient agriculture system it was decided to keep one village common for all key expert to visit. Based on discussion with PMU and inputs from key project staff, Chinchadgaon village in Aurangbad was selected for preparing the case study.

Before and After PoCRA Interventions in Chinchadgaon Village, Aurangabad

Chinchadgaon village (19°52'19"N; 74°48'53"E) is located in Vaizapur Taluka in Aurangabad district. The village area is about 1200 ha. There are 300 household in the village. The main kharif crops of the village are Cotton, Maize, Bajra and Chickpea. Being a rainfed area, the agricultural activities in this village was very limited before PoCRA interventions. The irrigated land was hardly 2-3 hectares which was used for Rabi crop like Onion and Wheat.

Once the village was covered under PoCRA in 2018, many activities were planned and implemented across the village, keeping in view the available natural resources and requirement of the farmers. In this village, about twelve types of activities were implemented as given in the table below.

Table 6.55 Details of Active Implemented in the Chinchadgaon Village

Activities	Number of Beneficiaries
Sprinkler	118
Drip	82
Farm Ponds-Community	83
Farm Ponds - Individual	4
BBF	0
FFS	0
PVC Pipes	34
Motor Pumps (Well)	14
Horticulture	15
Sericulture	11
Shade Net	15
Small Ruminants	5
All	**414**

Source: From the record relating to project implementations

The farmers have started cultivating summer soybean varieties like MAUS71, MAUS158, and MAUS612. Other improved crop production technologies like minor irrigation (instead of flood irrigation), shade net units with high value cash and ornamental crops, integrated fertiliser management, integrated pest management, crop residue management, soil and water conservation technologies have been implemented. Mulching through crop residues is also being used by the farmers as a result of training received by them under FFS. The farmers have received soil health card and are using the fertiliser like neem coated urea, DAP and MOP as per the recommendations provided by the agriculture department. The farmers are also using biopesticides like NSKE/neem oil with appropriate quantity and spraying at specific time interval during crop growth period.

Figure 6.14 Farm Pond in Chinchadgaon Village

It is found that some of the activities, like lining of nalas have given the desirable results especially in recharging the aquifer and improved reliability of water sources. The villagers reported that there is no major issue of water availability after the PoCRA interventions. They do fill the farm ponds by channelling the rainwater during monsoon, and with the well water during the month of January.

Figure 6.15 Onion cultivation under drip irrigation

As mentioned in the table above, 118 farmers have adopted sprinkler irrigation while 82 are doing drip irrigation. Many more people, after looking at the benefits of the drip and sprinkler system, are interested to avail these facilities. Most of the beneficiaries have already cleared the loan amount they had initially taken for the drip and sprinkler irrigation systems.

15 beneficiaries undertook shade net for commercial agriculture. They are cultivating capsicum, green chillies, and other vegetables. Some of them are using shade net unit for vegetable seed multiplication, as seed industries are in high demand. Impressed with success, they are looking for developing second shade nets with their own investment. Many other farmers from this village are coming forward to undertake shade nets.

Figure 6.16 Vegetable Cultivation in Chinchadgaonvillage

The Farmers Field School (FFS) has been promoted in this village. After getting trained under the FFS, the farmers are able to diagnose the diseases and pests by themselves. The farmers have also received training on climate resilient short duration crop varieties to sustain under the changing climatic conditions. During the interview with farmers, it is reported that on an average, the investment in agriculture land has increased to almost double in last 3 to 4 years.

Two custom hiring centers (CHCs) have been established which are being managed by two Self Help Groups, namely – i) Baliraja Sayam Sahayatu Shetkari Gat (Group) comprising 11 members; ii) Sri Swamy Samarth Sai Shetkari Gat (Group) comprising 15 members. These were established in 2019 and 2020 respectively with the facilitation support from the PoCRA. All the CHCs have at least one tractor and they use available diesel only as tractor fuel. Apart from tractors, there are trolley, cutting machine, rotavator, seed drill and plough in each CHC.

There have been changes in land holding patterns before and after the project intervention. The household have changed the land ownership in the name of females, mainly to be eligible for the getting the benefits under the PoCRA. There has been substantial increase in land ownership in favour of females, as there are certain financial concessions during land registration for females.

There has also been significant change in household assets before and after the project interventions. The field investigation reveals that there was a considerable expansion in the household assets after the project intervention. The change in assets was observed in construction of pucca houses, purchase of land, means of transportation and agricultural implements. Before the project, only about 15 percent of the beneficiaries had pucca houses, whereas after the project, around 90 percent have construction of pucca houses. Interestingly, about two percent of the farmers have created land assets by purchasing additional land.

Before the PoCRA implementation, about 17 percent of the farmers were having minor implements. After the project interventions, 96 percent have purchased the required implements. More than one-third farmers i.e. 35 percent have major implements that are required for major farm operations. Before the project, there was a negligible proportion of beneficiaries having four wheelers. During last three years of project implementation, nearly 3 percent of them have had four wheelers. There was also a substantial expansion in the proportion of the beneficiaries having two wheelers, i.e., 91 percent. It shows that the project has contributed a lot in improving household incomes considerably. As observed by the Agrieconomy expert, these households/beneficiaries use/invest in improving the living style and scaling up farm-based activities as discussed in table 6.51.

In this village, the VCRMC was established last year, in 2021. The VCRMC meetings are conducted mostly once in a month. The main activities undertaken are – review of project progress, guidance to farmers regarding application for matching grant, and monitoring of field activities. The composition of VCRMC is representative in nature with representations from SC/ST/marginal farmers, women farmers (4-5) as VCRMC members. The women/marginalised VCRMC members' villages expressed that they actively participated in voicing their opinion during meetings (especially sanction of applications). They also regularly followed up on the application status. Krushi Tai was appointed in 2020 and she is aware of her role and responsibilities as an interface between PoCRA team and the under-privileged sections of the society (marginal/small farmers/women). She is active in raising awareness about project, and regularly undertakes home visits.

Overall, the socio-economic progress of Chinchadgaon villagers has been impressive, and significant changes can be observed as a result of PoCRA interventions.

7. Key Challenges and Way Forward

In the concurrent monitoring round-V for the period October 2020 to March 2021, some of the recommendations were given to address the challenges. The actions taken by PMU to address these as identified during CM-VI in discussion with the experts of PMU and MIS have been summarized below:

Table 7.1 Challenges, recommendations and action – CM-V

Challenges observed during CM-V	Recommendations/ Way Forward	Action taken by the project for the suggested recommendation
1 Individual Farmer matching Grant Activities		
1.1 Large number of pending presanctions for the individual works at the SDAO level as the the desk below SDAO cannot reject the application during the spot verification	· The right to reject the application may be given to the officer who does the based on the technical field visit if the work at site is found not suitable or activity not complying with the guideline. Higher level officials may monitor these activities.	This challenge was understood to have occured due to workload of the staff and unavailability to go on the sites for timely spot verification. The situation has been further impacted because of COVID situation.
1.2 Some of the activities as part of the project were reported to be closed (like pipes, motor, open dug well, community farm pond, goat rearing) though there is still demand amongst the farmers for these assets.	· It is suggested that the project should reassess if any of the closed activities can be resumed. It is suggested that, if feasible, decision for resuming can be decentralized.	Open dug well activity has been resumed and the beneficiaries are applying for this activity.
1.3 Low demand for the E class farm pond in the project area as issue of maintenance post construction is challenging.	· This may be achieved through awareness and meeting with follow ups with the GP members and finding middle way by avoiding conflicts.	The awareness is done by the field staff in the VCRMC meetings for the awareness of this activity. The instructions

Challenges observed during CM-V	Recommendations/ Way Forward	Action taken by the project for the suggested recommendation
		have been passed to the field staff for carrying out this activity on large scale.
1.4 Low demand for the well recharge activity due to high cost and sometimes due to non-casing of wells in many areas as well as good rainfall in last two seasons	· The cost norms for the well recharge activity are low as per the actual construction cost, also farmers fear that the silt coming from the water may damage his well.	Efforts to generate awareness regarding this activity is undertaken through FFS
1.5 Workload on project staff is a persistent challenge, which results in a delay in approvals of the grant application. AAs on average have 5 villages (range 2-12) and CAs have 10 villages (range 6 -15), thus lowering their response time in conducting verifications and assistance in the application process.	· The number of villages under CAs/AAs with high number of villages should be reduced. · Hardship allowances and extra travel allowances can be provided to field staff working in difficult terrain or having high workload. · Need to build the capacity of Krushi Tais to assist AA and CA in application assistance to the farmers.	It is suggested that a task based assessment of work done by project staff can be done to understand the workload distribution. In regards with capacity building of Krushi Tais, 1738 KTs are trained till March 2021.
2 Farmers' Learnings		
2.1 Relatively low attendance of farmers regularly in farmer field schools, especially of women farmers. This issue was further amplified due to COVID-19, because of which issues are being faced.	· More focus needs to be given in mobilizing farmers to attend FFS session. All project stakeholders including VCRMC members, CA and AA should have a more proactive role in mobilizing farmers to attend FFS session • Suitable incentives should be provided to framers to attend FFS sessions. This could include a small kit with cap, pen along with tea arrangements and agri inputs (possible to be given). · Suitable timing of the FFS for men and women farmers are different and so variable timings should be attempted for both the groups. Family members of the women participating in FFS should also be informed about the benefits of learning new agriculture technologies in improving their household income.	Krushi Tai also plays an important role in mobilizing the farmers in the village. The Kit have been provided to the guest farmers for attending the FFS, which includes the pen, cap and notepad.

Challenges observed during CM-V	Recommendations/ Way Forward	Action taken by the project for the suggested recommendation
	· It was proposed if the number of FFS can be reduced while adding more crop related sessions in each FFS. This will help the farmers to understand different stages of crop growth and the measures to be taken in each case.	Currently the crops are reduced in FFS and only two crops are taken in FFS in Kharif season including one major crop
2.2 Quality of FFS sessions need to be improved, instead of targeting a high number of FFS sessions (suggested by a few SDAOs).	· More focus needs to be given on capacity building of FFS facilitators.	
2.3 The problem of quality of guidance received by farmers from FFS facilitator still persistent.	· The retired staff of Agri department or the current staff may be involved with some hardship allowance or extra payment to increase the effectiveness and quality of sessions.	
3 Community Benefits		
3.1 Community NRM works are still not being implemented at large scale. NRM works were observed in only three sample PoCRA villages.	· More efforts need to be put in by the project to expedite the implementation of community works.	The NRM portal is now live, and the capacity is of PS agri through time to time trainings at the WALMI and RAMETI for NRM works.
	· Workshop with key stakeholders should be conducted to identity the key impediments and practical solutions and realistic times should be set for their implementation.	
	· Micro planning and community works should be planned on priority basis for second and third phase villages.	
3.2 Lack of awareness amongst farmers about the benefits of NRM structures. Few framers perceive that soil and water conservations works might lead to soil erosion and productivity of the land might reduce.	· Awareness needs to be created among farmers about the benefits of NRM assets- both at community and individual level.	Exposure visits are being arranged in the villages to let the farmers know importance of NRM works.
	· FFS sessions can be used as platform to spread awareness on benefits of NRM structures.	
	· Key members of the community should be taken for exposure visit to places where NRM structures have benefitted the nearby farmers.	
4 PoCRA supported FPOs and SHGs beneficiaries		

Challenges observed during CM-V	Recommendations/ Way Forward	Action taken by the project for the suggested recommendation
4.1 Majority of FPOs are still facing difficulty in availing bank loans.	· Technical support (with help of expert agencies) should be provided to the FPOs to develop a bankable busines plan so that banks would be ready to provide them loans	The MOU has been signed by PoCRA with the Bank of Maharashtra and State Bank of India for ease to apply for loans as well as getting the loans sanctioned.
	• Facilitation support should be provided to the FPOs so that they can avail bank loan. The project should look for bank partnerships in this regard.	The CA and the dedicated Project Specialists for Agribusiness provides the Guidelines as well as details of experienced professionals for developing business proposals to the FPC representatives. Number of business proposals developed = ??? (Get data from MIS)
4.2 Lack of working capital for their activities is a key challenge faced by most FPOs.	· Facilitation support should be provided to FPOs to develop a sound business plan and for getting loans from the bank	The training to the FPC directors related to Godown are being conducted as well as the skilled Machine operators training are also organized for the skill improvement related to tractor mounted BBF machine and other skilled works related to tractor mounted equipment. Training conducted through BIRD, Mangaluru for districts functionaries and FPCs for bankable DPR preparation, techno-economic feasibility and Project management.
	· Representatives of FPOs should be provided professional training and exposure visits to build their capacity to run their FPO effectively.	
	· Support should be provided to FPOs to enhance the farmer membership base and the membership fee from the members.	
4.3 Limit of 2 Custom Hiring Centre (CHC) per village is somewhat less for fulfilling the equipment needs of big villages.	· The limit of two CHC per village may be revised as some villages sometimes have area upto 2-3 thousand Ha, therefore they will not be utilizing the equipment.	Members of FPCs are being trained at Vamnicom. For construction godown or small warehouse, a total of around Rs. 75 lakhs are disbursed among 7 farmer groups in Aurangabad district, around Rs. 36 lakhs among 3 farmer groups in Hingoli, and Rs. 148 lakhs among 11 farmer groups (including 3 SHGs and 5 FPCs) in Jalna are disbursed. One CHC is expected to serve minimum of 300 Ha of area. Based on the area of villages, optimal number of CHCs should be established.

Challenges observed during CM-V	Recommendations/ Way Forward	Action taken by the project for the suggested recommendation
4.4 Requirement of the Test report for procurement of the locally manufactured tools designed for the specific topography- The farmers and CHC requirement is generally for the locally made tools which are made for that special soil type and region	· The possibility of giving permission must be analyzed for CHC to purchase the tools which are specially designed for the soil type in that area.	Government approved machineries can be procured for CHCs. A two days training to CHC operators is provided for understanding the machineries procured at CHC.
5. Other Challenges		
5.1 Non-Availability of PC/Laptop at the Taluka level leading to delay in presanctions and day to work.	· There was demand from almost all the TAOs for the requirement of the PC or Laptop so that they can use it for day to day official works such as pre-sanctions as well as generating reports	There are nearly 155 TAOs. In first batch, 52 TAOs were provided with laptop. In second batch, the remaining 103 TAOs were provided with laptops. In addition to this, 15 SAO were provided tablets.
5.2 Some SDAO and PS reported of not getting the money of diesel for vehicle used during the field visit. Also one of the SDAO said that he has been giving the payment of driver as well as maintenance of vehicle used for the Field visits.	· The contingency money, like other parallel schemes of e-Thibak and Jalyukta shiwar, may be considered to be given to the subdivisional office to carry out the operational expenses.	It is suggested to hire a vehicle whenever field visits are to be conducted and claim the reimbursement for the same.

Table 7.2 Challenges and recommendations - CM-VI

Challenges observed during CM-VI	Recommendations/ Way Forward
1 Individual Farmer matching Grant Activities	
Difficulty in tracing the 7 years data of farmer for verification before giving grant to Drip, Sprinkler and Other activities through various platforms	Single window for getting data related to farmer to save time of staff
Application by farmers based on non-cultivable land (PotkhaRabi Land), thus difficulty by staff to convince farmer that he cannot take benefit on this land	VCRMC training so that during scrutinizing the application, they can reject and send application back to beneficiary
Demand for community farm pond, goat rearing by farmers	Need to reassess guidelines. If feasible, decision for resuming can be decentralized based on ground water levels and other critical factors such as employment for landless
Difficulties faced by TAO and Agri Supervisors due to non availability of Laptop and Printers	Due to increased responsibility of presanction and spot verification need for laptop and printer is utmost necessary at Taluka level along with computer operator
Difficulty in carrying out the daily operation cost for field visits due to no contingency amount in PoCRA at Subdivisional Level	Suggestion was given that Contingency funds may be allocated at the sub divisional level to carry out the Vehicle maintenance as well as Driver Payment. Provision should be made for contingency amount like that available under Jalyukt Shivar and IWMP

Challenges observed during CM-VI	Recommendations/ Way Forward
High workload reported by project staff remains a continuous challenge.	▪ AAs on average have 5 villages (range 2-12) and CAs have 10 villages (range 6 -15 Supply of additional Manpower is suggested by SDAO, TAO as well as DSAO's
2. Farmer Field Schools	
Low attendance of farmers regularly in FFS, especially women farmers	▪ More focus needs to be given in mobilizing farmers to attend FFS session. All project stakeholders including VCRMC members, CA and AA should have a more proactive role. Suitable incentives should be provided to farmers to attend FFS sessions. ▪ Motivation by giving tea, snacks or refreshment may help in increasing the attendance. This may also be added with a small kit including cap, pen and Agriculture inputs (possible to be given). ▪ Variable timings of men-women FFS sessions can enable more women to attend. Timely payment to the host farmer and timely supply of inputs must be done
	It was proposed if the number of FFS can be reduced while adding more crop related sessions in each FFS. This will help the farmers to understand different stages of crop growth and the measures to be taken in each case.
Number of FFS Sessions need to be increased, instead of targeting higher number of FFS	More crop related sessions in each FFS can be added. This will help the farmers to understand and take measures at different stages of crop growth as suggested by 2 SDAOs
Challenge in filling FFS application while administering the session	▪ Information to be entered in FFS session should be reviewed. FFS facilitators should be allocated separate time after the session and should be encouraged to fill the information (whatever possible) after the session
3. FPO	
Limited Awareness about Risk Management.	▪ FPO doesn't have a clear understanding about risks related to its business and operations. FPO realized importance of identification of risks, their impact on organization and strategies to mitigate them ▪ Implementation of risk management matrix and training through project may reduce chances of risks involved ▪ Primary business of FPO is agriculture or allied activities, hence risk analysis and mitigation plans need to be in place

Challenges observed during CM-VI	Recommendations/ Way Forward
▪Limited vision for Long term business strategies and operational plans	▪Capacity of the Governing board need to developed in terms of understanding their roles and responsibilities, businesses, finances, production, marketing and other operational issues ▪Benchmark of efficiency for each business process needs to defined and milestone-based approach needs to be followed by staff and management team

8. Progress Monitoring Based on Results Framework Indicators

Indicator No.[26]	Indicator	Measurement technique and data source	Progress at CM Round 5
5	*Number of farmers reached with agricultural assets or services (% of female)*	The data of number of farmers reached with assets or services has been collected from the project MIS, associated applications and relevant project personnel from PMU. The number of direct beneficiaries of the PoCRA include:	*Total number of farmers/beneficiaries reached through the project till 30th September 2021 is* 9,68,441 (513686 Male and 454755 Female)
		1. The data on individual grant beneficiaries has been taken from DBT portal.	Total Disbursement online- 209415 (37585 Female and 171830 Male) Total Registrations till date- 516752 (110471 Female and 406281 male) Total valid Applications- 1025347 Total Number of Beneficiaries- 150087 (Male- 122368 and Female- 27719)
		2. The data of beneficiaries of FFS has been taken from FFS application.	Total Number of FFS participants till date are 451689. The total number of Guest farmers are 435231and host farmers were 16458. The percentage of female are 10.73, with female count of 48474 *Total Number of Host farmers attended during the season of Kharif 2021 are 3735 (843 female farmer and 2892 male Farmer). The total number of guest farmers attended the FFS sessions are 179992 (27448 female farmers and 152504 male farmers) Current Round*
		4. People who have availed trainings under the program.	12312 trainings events including Project Officials and Farmers (with participation from 100855 male and 33320 female); 76 exposure

[26] as per PoCRA Results Framework

Indicator No.[26]	Indicator	Measurement technique and data source	Progress at CM Round 5
			visit (with participation from 655 males and 435 females) have been conducted. 28301 VCRMC members have been trained along with 1738 KT
7	*Area provided with new/improved irrigation or drainage services (in ha)*	The data of area with new or improved irrigation services and drainage services through individual activities under the project have been taken from DBT portal report. The data of community level new/improved irrigation services has been taken from Project Specialists of the project districts.	Area provided with 1. Sprinkler and Pump together- 313 Ha 2. With water pumps only - 1151 Ha 3. With only pipes is 17470 Ha 4. Sprinkler area - 44523.4 Ha 5. Drip area 35473 Ha Total Area – 98930.4 Ha
		Total area under Irrigation Projects= IP (Irrigation Project)$_1$*Area under irrigation project+ IP (Irrigation Project)$_2$*Area under irrigation project+ IP (Irrigation Project) $_n$*Area under irrigation project	
8	*Surface water storage capacity from new farm and community ponds (in 1,000 m3)*	The data of individual level farm ponds will be taken from DBT portal report. The data of community farm ponds has been taken from DBT Portal.	19571 (1000 *m3)*
		Total Water storage capacities of new Farm Ponds = FP (Farm Pond) $_1$*Storage capacity of FP+ FP $_2$*Storage capacity of FP+……+ FP $_n$*Storage capacity of FP	
		Total Water storage capacities of new Community Ponds = CP (Community Pond) $_1$*Storage capacity of CP+ CP $_2$*Storage capacity of CP+……+ CP $_n$*Storage capacity of CP	
11.	*Number of project-supported FPCs with growth in annual profits*	With the support of PS agriculture, the FPC representatives were contacted and their annual profit details of current year and last were enquired. Based on the analysis of the change in annual profits of the supported FPCs this indicator was to be calculated	16 out of 30 whose audited financial statement for FY 2020-21 were available* *Of the 58 project supported FPCs, 2 has received grant in 2019-20, 32 in 2020-21, and 24 in 2021-22. Since most of the FPCs has received grant from PoCRA starting 2020-21, we analysed the financial statements of 32 FPCs for year 2020-21. However, of these 32 FPCs, 30 FPCs has shared their audited statement for FY 2020-21 in which it is observed that 16 FPCs have recorded profit despite the Covid 19 pandemic situation. The support which these FPCs received from PoCRA helped them sustain their agribusiness activities and register profits. It must be noted that since the grant to remaining FPCs are provided recently (that is in financial year 2020-21), it is likely and

Indicator No.[26]	Indicator	Measurement technique and data source	Progress at CM Round 5
			anticipated that the other 14 FPCs will see benefits in terms of profits in subsequent financial years. The RF indicator implying number of project supported FPCs with growth in annual profit can only be estimated when we monitor these FPCs and analyze their audited statements over next two financial years. The remaining FPCs will be subsequently included in the analysis over next monitoring rounds once their audited financial statements are available Refer Annexure B for details of 30 FPCs whose audited financial statements are analyzed.
14	*Number of approved participatory mini watershed plans implemented / under implementation*	This indicator will be reported as an absolute number of participatory mini watershed plans approved by Gram Sabha. The information is collected by the microplanning agencies from the offices of the SDAOs. The microplanning agencies submit the validated mini watershed plans to the PMU where the data is recorded by the M&E specialist.	Number of approved participatory mini watershed plans implemented/under implementation are 533 till 31st March 2021 out of 533 villages in which implementation started.

9. Annexure

List of Sampled Villages

Sampled Project and Comparison Villages

Cluster code	District	Subdivision	Taluka	Census code	Village	Project/ Comparison
515_gv-40_02	Aurangabad	Vaijapur	Khuldabad	548942	Pimpri	Project (II)
515_gv-40_01	Aurangabad	Vaijapur	Khuldabad	548940	Palasgaon	Project (II)
515_gp-10_04	Aurangabad	Aurangabad	Aurangabad	548883	Gandheli	Project (I)
515_gp-16_03	Aurangabad	Aurangabad	Aurangabad	548823	Jalgaon Feran	Project (III)
515_gp-10_04	Aurangabad	Aurangabad	Aurangabad	548850	Nipani	Project (I)
523_gv-91_01	Beed	Ambejogai	Parli	559903	Moha	Project (II)
523_mr-8_02	Beed	Ambejogai	Kaij	559780	Palaskheda	Project (III)
523_sa-10_03	Beed	Bid	Ashti	558746	Bhojewadi	Project (I)
512_gv-94_02	Hingoli	Hingoli	Basnath	546385	Lon Bk.	Project (III)
512_ppg-8_01	Hingoli	Hingoli	Kalamnuri	546178	Mhaisgavhan	Project (III)
514_gp-13_02	Jalna	Jalna	Jafferbad	547499	Varkheda Viro	Project (III)
514_gp-32a_01	Jalna	Jalna	Jafferbad	547461	Kolegaon	Project (III)
514_gp-28_03	Jalna	Jalna	Jafferbad	547506	Dahigaon	Project (II)
514_gp-1a_02	Jalna	Jalna	Jalana	547613	Warkheda	Project (I)
514_gp-1a_02	Jalna	Jalna	Jalana	547614	Sevali	Project (I)
524_mr-54_01	Latur	Udgir	Udgir	561014	Loni	Project (III)
524_mr-49_01	Latur	Udgir	Jalkot	560418	Kekat Sindgi	Project (II)
524_mr-53_02	Latur	Udgir	Udgir	560987	Limbgaon	Project (II)
524_mr-47_05	Latur	Udgir	Udgir	560956	Mortalwadi	Project (II)
511_gv-112_04	Nanded	Deglur	Biloli	545043	Karhal	Project (II)
511_gv-112_02	Nanded	Deglur	Biloli	545019	Arli	Project (III)
511_gv-111_01	Nanded	Deglur	Dharmabad	544957	Rajapur	Project (II)
525_bm-11a_01	Osmanabad	Osmanabad	Umarga	561697	Dudhanal	Project (III)

Cluster code	District	Subdivision	Taluka	Census code	Village	Project/ Comparison
525_mr-30_01	Osmanabad	Osmanabad	Lohara	561640	Lohara Bk.	Project (II)
525_mr-23_03	Osmanabad	Osmanabad	Lohara	561630	Kanegaon	Project (I)
525_bm-7a_01	Osmanabad	Osmanabad	Lohara	561669	Jewali	Project (II)
525_mr-36_01	Osmanabad	Osmanabad	Umarga	561682	Narangwadi	Project (I) - NRM
513_gp-50_04	Parbhani	Parbhani	Parbhani	546717	Pimpla	Project (II)
513_gv-82_01	Parbhani	Parbhani	Parbhani	546807	Bramhapuri tarf pathri	Project (II)
513_gv-88_02	Parbhani	Parbhani	Purna	547254	Wazur	Project (I)
515_te-72_01	Aurangabad	Vaijapur	Vaijapur	549072	Wadji	C
515_te-37_02	Aurangabad	Sillod	Kannad	548260	Bhildari (nagad)	C
515_gp-1_02	Aurangabad	Sillod	Kannad	548273	Chincholi (L)	C
523_mr-8_01	Beed	Ambejogai	Kaij	559751	Bankaranja	C
523_gv-80_02	Beed	Manjlegaon	Manjlegaon	559388	Laul	C
512_gp-4a_03	Hingoli	Hingoli	Sengoan	545711	Barda	C
514_gv-54_03	Jalna	Partur	Ambad	547781	Pagirwadi	C
514_gv-54_03	Jalna	Partur	Ambad	547823	Lasura	C
524_mr-20_03	Latur	Latur	Latur	560154	Shiur	C
524_mr-45_02	Latur	Latur	Nilanga	560864	Waksa	C
511_gv-107_01	Nanded	Kinwat	Bhokar	544816	Therban	C
511_npg-8_02	Nanded	Kinwat	Himayatnagar	544422	Khadki (bazar)	C
525_bm-10a_04	Osmanabad	Osmanabad	Umarga	561721	Manegopal	C
525_mr-17_03	Osmanabad	Osmanabad	Osmanabad	561407	Takali Dhoki	C
513_gp-48_03	Parbhani	Parbhani	Jintur	546594	Mankeshwar[P.jintur]	C

DBT Status

District	Taluka	Village	Total Application	Pre-Sanction	Beneficiary Farmers	Disbursed Amount (Rs,)
Aurangabad	Khuldabad	Pimpri	764	328	180	9229801
Aurangabad	Khuldabad	Palasgaon	1792	898	469	28089341
Aurangabad	Aurangabad	Gandheli	434	179	68	11231270
Aurangabad	Aurangabad	Jalgaon Feran	1480	567	183	10493369
Aurangabad	Aurangabad	Nipani	785	360	196	9278195
Beed	Parli	Moha	791	256	112	3293879
Beed	Kaij	Palaskheda	713	253	104	3675845
Beed	Ashti	Bhojewadi	367	105	26	500778
Hingoli	Basnath	Lon Bk.	999	580	279	14493307
Hingoli	Kalamnuri	Mhaisgavhan	229	103	48	1235664
Jalna	Jafferbad	Varkheda Viro	507	117	53	1519052
Jalna	Jafferbad	Kolegaon	525	150	60	7734704
Jalna	Jafferbad	Dahigaon	919	176	100	3064693
Jalna	Jalana	Warkheda	417	100	28	8548700
Jalna	Jalana	Sevali	2234	440	230	10933826
Latur	Udgir	Loni	190	118	52	1435215
Latur	Jalkot	Kekat Sindgi	522	239	55	1957246
Latur	Udgir	Limbgaon	241	118	62	2301408
Latur	Udgir	Mortalwadi	418	162	85	5467341
Nanded	Biloli	Karhal	82	32	7	124481
Nanded	Biloli	Arli	341	256	90	2300135
Nanded	Dharmabad	Rajapur	495	101	36	2065244
Osmanabad	Umarga	Dudhanal	68	42	18	628810

District	Taluka	Village	Total Application	Pre-Sanction	Beneficiary Farmers	Disbursed Amount (Rs,)
Osmanabad	Lohara	Lohara Bk.	689	306	160	4460203
Osmanabad	Lohara	Kanegaon	1204	807	359	7362988
Osmanabad	Lohara	Jewali	1590	457	213	5736148
Osmanabad	Umarga	Narangwadi	548	416	183	5025565
Parbhani	Parbhani	Pimpla	270	133	50	1502412
Parbhani	Parbhani	Bramhapuri tarf pathri	1172	431	193	5831241
Parbhani	Purna	Wazur	1538	966	448	8838745

List of Stakeholder Interviewed

List of Agriculture Assistants Interviewed

Sr No.	District	Subdivision	Taluka	Village
1	Aurangabad	Vaijapur	Khuldabad	Pimpri
2	Aurangabad	Vaijapur	Khuldabad	Palasgaon
3	Aurangabad	Aurangabad	Aurangabad	Nipani
4	Aurangabad	Aurangabad	Aurangabad	Gandheli
5	Aurangabad	Aurangabad	Aurangabad	Jalgaon Feran
6	Jalna	Jalna	Jalana	Warkheda
7	Jalna	Jalna	Jalana	Sevali
8	Beed	Ambejogai	Parli	Moha
9	Beed	Ambejogai	Kaij	Palaskheda
10	Beed	Beed	Ashti	Bhojewadi
11	Jalna	Jalna	Jafferbad	Varkheda Viro
12	Jalna	Jalna	Jafferbad	Kolegaon
13	Osmanabad	Osmanabad	Umarga	Dudhanal
14	Osmanabad	Osmanabad	Umarga	Narangwadi
15	Parbhani	Parbhani	Parbhani	Pimpla

Sr No.	District	Subdivision	Taluka	Village
16	Parbhani	Parbhani	Parbhani	Bramhapuri tarf pathri
17	Osmanabad	Parbhani	Lohara	Kanegaon
18	Parbhani	Parbhani	Purna	Wazur
19	Osmanabad	Osmanabad	Lohara	Jewali
20	Hingoli	Hingoli	Kalamnuri	Mhaisgavhan
21	Hingoli	Hingoli	Basnath	Lon Bk.
22	Nanded	Hingoli	Biloli	Karhal
23	Nanded	Deglur	Biloli	Arli
24	Latur	Udgir	Udgir	Loni
25	Latur	Udgir	Jalkot	Kekat Sindgi
26	Nanded	Deglur	Dharmabad	Rajapur
27	Latur	Udgir	Udgir	Limbgaon
28	Latur	Latur	Udgir	Mortalwadi

List of Cluster Assistants Interviewed

Sr No.	District	Subdivision	Taluka	Village
1	Aurangabad	Vaijapur	Khuldabad	Pimpri
2	Aurangabad	Aurangabad	Aurangabad	Nipani
3	Aurangabad	Aurangabad	Aurangabad	Jalgaon Feran
4	Jalna	Jalna	Jalana	Sevali
5	Beed	Ambejogai	Parli	Moha
6	Beed	Ambejogai	Kaij	Palaskheda
7	Beed	Beed	Ashti	Bhojewadi
8	Jalna	Jalna	Jafferbad	Varkheda Viro
9	Jalna		Jafferbad	Dahigaon
10	Osmanabad	Osmanabad	Umarga	Narangwadi
11	Parbhani	Parbhani	Parbhani	Pimpla

Sr No.	District	Subdivision	Taluka	Village
12	Parbhani	Parbhani	Parbhani	Bramhapuri tarf pathri
13	Osmanabad	Osmanabad	Lohara	Kanegaon
14	Parbhani	Osmanabad	Purna	Wazur
15	Osmanabad	Osmanabad	Lohara	Jewali
16	Hingoli	Hingoli	Kalamnuri	Mhaisgavhan
17	Hingoli	Hingoli	Basnath	Lon Bk.
18	Nanded	Deglur	Biloli	Karhal
19	Nanded	Deglur	Biloli	Arli
20	Latur	Deglur	Udgir	Loni
21	Latur	Udgir	Jalkot	Kekat Sindgi
22	Nanded	Udgir	Dharmabad	Rajapur
23	Latur	Udgir	Udgir	Limbgaon
24	Latur	Udgir	Udgir	Mortalwadi

List of Krushi Tais Interviewed

Sr No.	District	Subdivision	Taluka	Village
;	Aurangabad	Vaijapur	Khuldabad	Pimpri
2	Aurangabad	Vaijapur	Khuldabad	Palasgaon
3	Aurangabad	Aurangabad	Aurangabad	Gandheli
4	Aurangabad	Aurangabad	Aurangabad	Jalgaon Feran
5	Jalna	Jalna	Jalana	Warkheda
6	Jalna	Jalna	Jalana	Sevali
7	Beed	Ambejogai	Parli	Moha
8	Beed	Ambejogai	Kaij	Palaskheda
9	Osmanabad	Osmanabad	Umarga	Dudhanal

Sr No.	District	Subdivision	Taluka	Village
10	Osmanabad	Osmanabad	Umarga	Narangwadi
11	Parbhani	Parbhani	Parbhani	Pimpla
12	Osmanabad	Osmanabad	Lohara	Jewali
13	Hingoli	Hingoli	Kalamnuri	Mhaisgavhan
14	Latur	Deglur	Udgir	Loni
15	Latur	Udgir	Jalkot	Kekat Sindgi

List of FFS Coordinators Interviewed

Sr No	District	Subdivision	Taluka	Village
1	Aurangabad	Aurangabad	Nipani	Aurangabad
2	Jalna	Jalana	Sevali	Jalna
3	Beed	Ashti	Bhojewadi	Beed
4	Jalna	Jafferbad	Kolegaon	Jalna
5	Parbhani	Parbhani	Pimpla	Parbhani
6	Osmanabad	Lohara	Jewali	Osmanabad
7	Deglur	Biloli	Arli	Deglur
8	Udgir	Jalkot	Kekat Sindgi	Udgir

List of FFS Facilitators Interviewed

Sr No	District	Subdivision	Taluka	Village
1	Aurangabad	Vaijapur	Khuldabad	Pimpri
2	Aurangabad	Aurangabad	Aurangabad	Nipani
3	Aurangabad	Aurangabad	Aurangabad	Gandheli
4	Aurangabad	Aurangabad	Aurangabad	Jalgaon Feran
5	Beed	Ambejogai	Parli	Moha
6	Beed	Ambejogai	Kaij	Palaskheda

Sr No	District	Subdivision	Taluka	Village
7	Jalna	Jalna	Jafferbad	Kolegaon
8	Jalna	Jalna	Jafferbad	Dahigaon
9	Osmanabad	Osmanabad	Umarga	Dudhanal
10	Parbhani	Parbhani	Parbhani	Pimpla
11	Parbhani	Parbhani	Parbhani	Bramhapuri tarf pathri
12	Osmanabad	Osmanabad	Lohara	Jewali
13	Hingoli	Hingoli	Basnath	Lon Bk.
14	Nanded	Deglur	Biloli	Karhal
15	Nanded	Deglur	Biloli	Arli

List of Agriculture Supervisor Interviewed

Sr No	District	Subdivision	Taluka	Village
1	Aurangabad	Vaijapur	Khuldabad	Palasgaon
2	Jalna	Jalna	Jalana	Sevali
3	Beed	Ambejogai	Parli	Moha
4	Parbhani	Parbhani	Parbhani	Pimpla
5	Osmanabad	Osmanabad	Lohara	Kanegaon
6	Hingoli	Hingoli	Kalamnuri	Mhaisgavhan
7	Nanded	Deglur	Biloli	Arli
8	Latur	Udgir	Jalkot	Kekat Sindgi

List of FPC representative interviewed

S.No	Taluka	Post	Name of FPC
1	Khultabad	Chairman	Bhadra Agro Producer Company
2	Aurangabad	Chairman	Lamkana farmer Producer Company Limited Lamkana Taluka Aurangabad

S.No	Taluka	Post	Name of FPC
3	Kaij	Chairman	SSK Agro Producer Company Ltd Yusuf Wadgaon Taluka Kaij Dist Beed
4	Ambejogai	Chairman	Walmik Krusshi Shetkari Producer Company Limited Ghatnandur
5	Sengaon	Chairman	Khodke Agro Producer Company Limited
6	Aundha Nagnath	Chairman	Siddhanath Nagnath Agravet Farmers Producer Company Ltd, Siddheshwar Tal. Aundha
7	Ardhapur	Director	ShetKari Mitra Farmer Producer Cooperative ltd
8	Loha	Chairman	Dharni Shetkari Producer Company
9	Shirur	Director	Shri Anantpal Agro Producer Company Ltd
10	Chakur	CEO	Latur Kisan Producer Comp[pany Limited
11	Ausa	Chairman	Prayagbai Jadhav Agro Producer Company Ltd Karajgaon, Taluka Ausa
12	Lohara	Director	Sant Shiromani Maruti Maharaj Agro Producer Company Ltd Mardi Taluka Lohara
13	Jaffrabad	Chairman	Agro Touch FPC Ltd
14	Jaafrabad	Director	Jeevrekha Agri Producer Company Ltd Ganeshpur
15	Jalna	Director	Sadanand Farmer Cooperative ltd
16	Ambad	Director	Amhi Baliraja Producer Company Ltd Mathjalgaon, Ambad, Dist Jalana

List of Taluka Agricultural Officers Interviewed

Sr No.	District	Subdivision	Taluka
1	Aurangabad	Aurangabad	Aurangabad
2	Jalna	Jalna	Jalana
3	Beed	Ambejogai	Parli
4	Parbhani	Parbhani	Parbhani
5	Osmanabad	Osmanabad	Lohara
6	Hingoli	Hingoli	Kalamnuri
7	Latur	Deglur	Udgir
8	Nanded	Udgir	Dharmabad

List of Project Specialists Interviewed

Sr. No	District	Project Specialists Participated in FGD
1	Parbhani	PS Agri Business
		PS Procurement
2	Aurangabad	PS HRD
		PS-Procurement
3	Nanded	PS AGRI
		PS HRD
		PS-Procurement
4	Hingoli	PS-Procurement
		PS AGRI
		PS HRD
5	Latur	PS HRD
		PS Agri
		PS AB
		PS-Procurement
6	Jalana	PS-Procurement
		PS Agri
		PS Agri Business
		PS HRD
7	Osmanabad	PS-Procurement
		PS Agri
		PS Agri Business
		PS HRD
8	Beed	PS Agri Business
		PS Agri
		PS-Procurement

Sr. No	District	Project Specialists Participated in FGD
		PS HRD

List of Sub-Division Agriculture Officers Interviewed

S.No	District	Subdivision
1	Jalana	Jalna
2	Osmanabad	Osmanabad
3	Nanded	Nanded
4	Parbhani	Parbhani
5	Latur	Latur
6	Beed	Beed

List of DSAOs Interviewed

Sr. No.	District
1	Nanded
2	Parbhani
3	Beed
4	Latur
5	Hingoli

List of 30 FPCs whose audited financial statements for FY 2020-21 are analysed

S.No	District	Name of the FPC which received grant from PoCRA for Agri Business Activity	FPC'c Annual profit/ loss as per audited statement 2020-21
1	Hingoli	Khodke Agro FPC	-98569
2	Hingoli	Anukaran FPC	408128
3	Hingoli	Siddhnath Nagnath Agrovet FPC	261088
4	Hingoli	Rayatecha Raja FPC	8561
5	Latur	Alzirath Agro FPC	10367
6	Latur	Latur Kisan FPC	-533986
7	Latur	Omsai Adhunik FPC	241303
8	Latur	Gutti Agro FPC	2346
9	Latur	Prayagbai Jadhav Agro FPC	-307763
10	Latur	Murudeshwar FPC	-16895

S.No	District	Name of the FPC which received grant from PoCRA for Agri Business Activity	FPC'c Annual profit/ loss as per audited statement 2020-21
11	Latur	Rasika FPC	-96595
12	Latur	AV 28 Foods FPC	21565
13	Latur	Vikasratna FPC	361716
14	Osmanabad	ODSF Agro FPC	-1362532
15	Osmanabad	Sant Shiromani Maruti Maharaj Agro FPC	23783
16	Jalna	Agro tech FPC	9824
17	Jalna	Jeev Rekha Agri FPC	-53297
18	Jalna	Mstodhari Agri FPC	-90462
19	Jalna	Bhumi Putra Farmtech FPC	-17562
20	Jalna	Jamuvant Agro FPC	32624
21	Aurangabad	Shribhadra FPC	35044
22	Aurnagabad	Saakar Shetkari FPC	-15714
23	Beed	Mauli Agro FPC	25420
24	Beed	SSk Agro FPC	2050
25	Beed	Valmiki Rishi FPC	-99082
26	Beed	Aadesh Seeds Agro FPC	-17418
27	Beed	Adhikanth Seeds Agro FPC	-18763
28	Beed	Deepankur Agro FPC	-11955
29	Beed	Krantijyoti Agro FPC	135327
30	Nanded	Shetkari Mitra FPC	19321

Verification of agribusiness assets of project supported FPCs which were visited during CM VI round survey

SN	District	Taluka	Village	FPC Name	Remark	Photo
1	Jalna	Ambad	Math Jalgaon	Aamhi Baliraja FPC	Warehouse was in good condition but is non-operational	
2	Jalna	Jafrabad	Dhondakheda	Agro Touch FPC	Warehouse was in good condition but is non-operational	Be 

3	Jalna	Jafrabad	Dhondkhed a	Agro Touch FPC	All farm equipments were with the member farmers as reported by the CHC representative	
4	Jalna	Ambad	Pagrwadi	Jamvant Agro FPC	Non-operational godown	
5	Jalna	Jafferbad	Ganeshpur	Jeevrekha Agri FPC	Machines were in good condition at site but were kept in open space instead of CHC shed.	

6	Hingoli	Sengoan	Shegaon khodke	Khodke Agro FPC	Land Leveler was in good condition with farmer. Rusty seed drill was in non-operation condition and was found at another location. Rusty reversible plough was in non-operation condition and was found at another location. Other equipments were with farmer as reported by CHC representative	  

7	Aurangabad	Aurangabad	Lamkana	Lamkana FPC	Thresher was in good operational condition. Other equipments were with farmers as reported by CHC representative	 
8	Latur	Chakur	Jagalpur	Latur kisan FPC	Equipments were in good operational condition	 
9	Beed	Beed	Doifwadi	Mauli Agro FPC	Thresher was in good operational condition. Seed drill was in operational condition in farmer's field.	  

10	Latur	Chakur	Gharola	Om Sai Adhunik FPC	Tractor was in good operational condition. Godown was operational and in good condition. Seed processing unit was operational, but premise was not well maintained.	  
11	Beed	Kaij	Yusufavadgaon	S.S.K. Agro FPC	Equipments were available in the CHC shed and were in good operational condition	

12	Nanded	Kandar	Kandar	Sambhaji Maharaj FPC	Rusty reversible plough was found to in abandoned condition in farmer field.	
13	Osmanabad	Lohara	Mardi	Sant Shiromani Maroti Maharaj Agro FPC	Rusty thresher was in non-operational condition. Cultivator was found in abandoned condition outside the shed. Other equipments were with farmers as reported by CHC representative	 

14	Nanded	Ardhapur	Malegaon	Setimitra FPC	Equipments were in good condition and found in farmer's field	 
15	Aurangabad	Khuldabad	Deolana khurd	Shree Bhadra Agro FPC	Rusty plough was found in abandoned condition. Rotavator was in good condition, but was kept in open space.	 
16	Latur	Latur	Shiur	Shri Antpal Agro FPC	Cultivator and seed processor were in good condition in CHC shed.	  

17	Hingoli	Audha	Siddheshw R	Siddhanath Nagnath Shetkari Gat	Commodity processing unit was in good operational condition.	
18	Jalna	Jalana	Shivni	Keshav Raj Shetkari Gat	Rotavator and seed drill machine were found to be in good operational condition but were kept in open space.	

19	Aurangabad	Gangapur	Ambegao	Shri Panchakrushna Shetkari Gat	Rotavator, V pass, and 2 cultivators were in good operational condition but were kept in open space.	
20	Parbhani	Parbhani	Jamb	Matoshri Mahila Bachat Gat	Tractor mounted thresher and tractor were found in good operational condition.	
21	Osmanabad	Osmanabad	Ansudi	Krushi Kranti Setkari Gat	Equipments were found in good operational condition.	

22	Jalna	Jalana	Shivni	Keshav Raj Shetkari Gat	Equipments were found in good operational condition.	
23	Latur	Latur	Raywadi	Nanaji Deshmukh Setkari Gat	Equipments were found in good operational condition.	
24	Beed	Dharur	Rui Dharur	Sant Gajanan Shetkari Bachat Gat	Tractor was found in good operational condition. Other equipments were reported to be with member farmers.	 

25	Hingoli	Aunda	Siddheshwar	Dhanshree Khushi Utpadak Setkari Gat	Goat rearing activity was operational.	
26	Nanded	Deglur	Lakhkha	Sree New khandoba Shetkari Gat	Equipments were found in good operational condition.	

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