सत्यमेव जयते

महाराष्ट्र शासन

नानाजी देशमुख कृषि संजीवनी प्रकल्प

(महाराष्ट्र शासन आणि जागतिक बँक यांचा संयुक्त प्रकल्प)

कृषि विभाग

Maharashtra Project on Climate Resilient Agriculture

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

Digitizing Agriculture for Climate Resilience

June 2021

POCRA

Farm ponds like the one in the field of Mr. Rajendra Baburao Kide in village Bodhlapuri, Block- Ghansavangi, District- Jalna provide water security and allow diversification of cropping pattern. (Photo courtesy - Atul Dahibhate)

Message from the Chief Minister, Maharashtra

Hon. Shri Uddhav Thackeray

The Government of Maharashtra is committed to the welfare of farmers. We have taken several initiatives to improve their profitability with a focus on small and marginal farmers. "**Vikel Te Pikel**" (market-led production) is one such initiative aimed at better price realization for the farmers.

Currently, we are all experiencing a difficult situation because of the COVID-19 pandemic. However, farmers are frequently facing such stressful experiences due to unpredictable weather. Climate change is likely to further affect the lives of farmers in the coming decades. Maharashtra Project on Climate Resilient Agriculture (PoCRA) has identified key challenges faced by the agriculture sector due to climate change and is working towards building the resilience of some of the most vulnerable areas. I am confident that we would overcome the challenges of climate change with the adoption of the Climate Resilient Technologies and Practices.

I am happy to note that the Information and Technology initiatives of PoCRA are helping the farmers in getting benefits faster and in a transparent manner. Access to new technologies and agro-meteorological advisories will help the farmers in making better decisions regarding crop selection, production, and marketing. With the help of such IT initiatives in the agriculture sector, we can realize adoption of the climate-resilient practices, making farmers' lives easier and farm based livelihoods more profitable.

I thank the partnership between the Government of Maharashtra and the World Bank which has led to this innovative initiative.

Message from the Deputy Chief Minister

Hon. Shri Ajit Pawar

IT initiatives are needed for improving service delivery

The state government extends financial and logistical support to farmers in the form of grants and subsidies through various schemes. These benefits are supposed to reach maximum number of people. A robust IT system provides transparency and smooth functioning to a great extent. Every rupee allotted to the agriculture sector for the benefit of farmers can reach the end-user quickly and predictably. Fund transfers and implementation of project components become faster and efficient with the help of Information Technology.

Financial support from the World Bank and the state government enabled PoCRA to take up a number of noteworthy initiatives. Its end-to-end automated DBT portal is one of its kind in Maharashtra which has increased the ease of transaction such as direct transfer of benefits into the bank accounts of farmer-beneficiaries. Due to a fast and efficient online process, PoCRA has been able to release funds transparently and efficiently.

I am of the considered opinion that such IT initiatives are necessary for improved service delivery and farmer centric implementation of agriculture sector projects.

Message from the Minister of Agriculture

Hon. Shri Dadaji Bhuse

IT system has enabled a transparent and accountable governance

Maharashtra's Project On Climate Resilient Agriculture (PoCRA) has been operating in more than 5000 villages of 15 drought-affected districts of the state, impacting more than 1.8 million farmers. The project's attempt to reach out to maximum beneficiaries in the project area villages will definitely be complemented by IT initiatives. Participation of a maximum number of farmers, and particularly women farmers, in the project area, has been attained effectively through means of Information Technology.

I have seen that the IT initiatives of PoCRA are very helpful in monitoring the project activities thoroughly. The IT system enables the identification of areas needing improvement and helps focus efforts accordingly. The project trying to create healthy competition among stakeholders at the district, subdivision and village level. This in turn has strengthened the whole project implementation and service delivery. The massive field level data arising out of project implementation is being analysed for gaining insights into problem areas and remedial interventions thereon. The customized IT tools are proving to be invaluable for decision making at all levels.

PoCRA has helped beneficiaries with hassle-free Direct Benefit Transfer payments. The IT system has enabled a transparent and accountable governance and service delivery ensuring minimal number of grievances. This itself is an indication of the satisfaction of farmers and other stakeholders.

The Village Level Climate Resilience Management Committee (VCRMC) headed by the village chief- Sarpanch has a pivotal role in this project. VCRMCs can use information about water availability and usage, weather parameters, and potential for new works. The 'Village Development Profile' launched by me is helping the community in real-time monitoring of the project activities. The online process for Natural Resource Management (NRM) works provides transparency in the procurement and implementation process.

Message from the Minister of State for Agriculture

Hon. Shri Vishwajeet Kadam

PoCRA IT system has eliminated duplication of efforts by project functionaries

Information Technology is now being used to a large extent in many sectors. It is heartening to note that the Project on Climate Resilient Agriculture has taken a lead in developing robust IT systems for planning, monitoring, and implementation which has resulted in effective and efficient service delivery to the key stakeholders. The PoCRA IT system has eliminated duplication of efforts by project functionaries allowing them to focus their energies in other productive works. This has ensured greater satisfaction among the farmers.

The DBT portal developed by the project has enabled farmers to apply online without having to visit government offices and also receive the project benefits into their bank accounts. This has boosted the speed of the project implementation and farmers' confidence in the project. It is also helping in upgrading the skills of officials as well as in motivating farmers to become digitally empowered. Access to the real-time information on the project will increase the trust between the farmer and the Agriculture Department.

Message from the Secretary, Department of Agriculture

Shri Eknath Dawale, IAS

We expect to broaden the adoption of the IT applications developed at PoCRA for the benefits of the farmers across the state of Maharashtra

Maharashtra Project on Climate Resilient Agriculture (PoCRA) is significant support for farmers in the drought-prone districts of Maharashtra, in the Marathwada, Vidharbha and Khandesh regions.

IT applications developed by PoCRA, like Water Budget Model and Farmer Field Schools, are path-breaking in providing IT-based capacity and capability building on climate-resilient farming practices to farmers. The involvement of village-level committees and field officials in the approval mechanism has helped to increase the transparency and efficiency of the project.

In addition to the field activities, PoCRA has developed reusable applications for approvals as well as monitoring at various levels. The DBT applications developed for individual farmers, village-level communities and groups/companies have proven effective to quickly and smoothly disburse funds directly to an Aadhaar-linked bank account of farmer and farmer collectives.

Through the Department of Agriculture, we expect to broaden the adoption of the IT applications developed at PoCRA for the benefits of the farmers across the state of Maharashtra.

Foreword from the Project Director

Vikas Chandra Rastogi, IAS

As the project director of the Maharashtra Project on Climate Resilient Agriculture (PoCRA) since its inception in 2016, I have had the opportunity to prepare the project proposal, including the Project Implementation Plan and manuals conforming to the World Bank fiduciary policies and social and environmental safeguards, present it to the Government of Maharashtra, the Department of Economic Affairs (DEA) Government of India, and the World Bank and obtain all approvals. The project is being implemented since May 2018.

The agriculture sector in Maharashtra is characterized by small landholdings with more than 84% of the 15 million farmers having less than 2 Ha. of farmland. 149 out of 355 talukas in Maharashtra are drought-prone. While unpredictable rainfall pattern and other weather anomalies lead to agrarian distress, climate change is likely to accentuate such hardships.

The Maharashtra Project on Climate Resilient Agriculture aims to enhance climate resilience and profitability of smallholder farming systems by making investments in farm and community level agriculture infrastructure and adoption of climate-smart technologies. The project seeks to achieve this through a coordinated effort of the public sector agriculture extension network of more than 3000 functionaries to reach out to more than 1.8 million farmers having 3 million Ha of farmlands in 5000+ project villages. Engaging with such a large and geographically spread out farming community in a real-time manner and provide need-based services to them transparently and efficiently was a challenge that was identified during the project conceptualization stage itself.

The past few decades have demonstrated that technology is the biggest leveller and can help in scaling up initiatives in a short time. Since the beginning, PoCRA realised that the farmers and the communities can be engaged only by an aggressive adoption of Information Technology. It has, therefore, consciously used technology to reach out to the most vulnerable farmers and provide them support for investments that are verifiable, through processes that are user friendly, responsive, and transparent. The project has developed applications in Marathi which is the local language and on the widely used android platform. The applications are intuitive and easy to use, and are accessible from the comforts of home. The farmers get real-time updates through SMS about their transactions and matching grants get deposited directly into their Aadhar-linked bank account. Weather-based agriculture advisories enable them to take timely decisions to save their crops. The communities can plan and monitor the project activities with the help of dashboard and reports which are easy to understand. These are some of the features of this approach that have encouraged farmers in adopting new technologies and enhanced the trust of farmers in the agriculture department.

PoCRA has leveraged the power of data and created 'Office on Mobile' for the extension functionaries. Easy access to required information, simplified business processes, and the ability to create and connect with a network of farmers have enhanced the efficiency and productivity of the workforce. The project related information is captured at the point of its generation which ensures data integrity. Information asymmetry has been removed through proactive disclosure of data and making it available in the public domain. Real-time monitoring of project activities at all levels has ensured timely corrective actions and improved performance.

I am grateful to the honourable Chief Minister of Maharashtra. His vision for the agriculture sector has guided us to provide quality services to the farming community. Honourable Deputy Chief Minister has given his unstinted support to the project despite the financial strain on the public exchequer during the pandemic. Honourable Minister for Agriculture has inspired us to continuously innovate and serve the most vulnerable farmers. He has been actively involved in reviewing the progress of project and extending support wherever needed. The Secretary, Agriculture has taken the initiative to replicate some of the good practices demonstrated through the project for the entire state.

Ranjan Samantaray, Task Team Leader, Agriculture Global Practice along with the World Bank task team (Vikas Kanungo, Shashank Ojha and other team members) have helped in preparation of an ICT based responsive and technically sound project design and approach. The World Bank team assisted the project in conceptualization of an Agri Stack and its development in a modular fashion. The project initiatives mentioned in this book have been put in a wider perspective of rural and community development by Radhika Rastogi, IAS, Deputy Director-General, National Institute of Rural Development and Panchayati Raj, Hyderabad.

Last, but not least, each member of the team at PoCRA has contributed to these initiatives and their synergy has proved that the whole is greater than the sum of its parts.

Glossary of Terms

Abbreviation	Details
AA	Agriculture Assistant
API	Application Protocol Interface
APMC	Agricultural Produce Market Committee
AS	Agriculture Supervisor
AWS	Automated Weather Station
CA	Cluster Assistant
CAO	Circle Agriculture Officer
DBT	Direct Benefit Transfer
DSAO	District Superintendent Agriculture Officer
FAST	Field Activities Supervision and Tracking System
FFS	Farmer Field School
FIMS	Finance Information System
FPC	Farmer Producer Companies
FPO	Farmer Producer Organization
GIPE	Gokhale Institute Of Politics & Economics
GIS	Geographical Information System
IBRD	International Bank for Reconstruction and Development
ICAR	Indian Council of Agricultural Research
IIT-B	Indian Institute of Technology, Bombay
IMD	Indian Meteorological Department
IoT	Internet of Things
KPI	Key Performance Indicator
Marginal Farmers	Farmers having land holding less than 1 Ha
MIS	Management Information System
MLP	Micro Level Planning
MRSAC	Maharashtra Remote Sensing Application Centre
MSINS	Maharashtra State Innovation Society
NPCI	National Payment Corporation of India
NRM	Natural Resource Management
PD	Project Director
PMGDisha	Prime Minister Gramin Digital Saksharta Abhiyan
PoCRA	Project on Climate Resilient Agriculture
SDAO	Sub Divisional Agriculture Officer
SHG	Self Help Group
Small Farmers	Farmers having land holding between 1-2 Ha
SSO	Single Sign On
TAO	Taluka Agriculture Officer
TISS	Tata Institute of Social Sciences
UIDAI	Unique Identification Authority of India
VCRMC	Village Climate Resilient Agriculture Management Committee

Vermicompost plant used to generate organic compost from farm and animal waste, to be used as a farm input.

Contents

	Executive Summary	7
01	Digital Initiatives for Climate Resilient Agriculture	9
A	GIS-driven planning and decision making	13
B	Bringing transparency, accountability, and efficiency in service delivery	20
C	Scaling up extension services	28
02	Impact delivered digitally	35
03	The road ahead for digital technology at PoCRA	42
04	Appendix : Project Background, Components, Interventions, and Partnerships	45

Executive Summary (1/2)

In the recent past, certain parts of Maharashtra have been facing agrarian distress due to frequent droughts and extreme climate events including prolonged dry spells and untimely rains. Further, the vagaries of climate change are likely to particularly impact marginal and small landholders who have scanty resources to tide over these crises.

The Project on Climate Resilient Agriculture was conceptualised by the Department of Agriculture, Government of Maharashtra and the World Bank to develop a drought-proofing and climate-resilient strategy for the agriculture sector as a long-term and sustainable measure, to address the likely impacts of climate variabilities and climate change. The village-level development plan under the project emerges after a comprehensive data-driven microplanning exercise led by the community. The village development plan includes measures for optimal utilization of natural resources, appropriate cropping pattern, adoption of latest technologies, and improved access to markets. The project focuses on the evidence-based scientific implementation of this plan.

The project has introduced transformational changes in the agriculture sector by scaling up the adoption of climate-smart technologies and practices at the farm and micro-watershed level, contributing to drought-proofing and creation of new opportunities in villages worst hit by drought and salinity/sodicity affected villages in the state. The project is supporting investments by farmers, farmers' collectives, and communities for accessing water, optimal utilization of natural resources, value addition of agriculture commodities, and adoption of climate-resilient agriculture technologies. The project has taken a gender-sensitive approach to prioritize the needs of the women stakeholders in the planning and implementation of project interventions which is being driven through "Krushi *Tais*" (female mobilizers) at the village level.

Applying disruptive technologies to address climatic challenges was strategized by the World Bank to increase efficiency and effectiveness of the project interventions. Leveraging the potential of Industry 4.0 Digital Technologies, the World Bank pooled its national and global expertise to create an Electronic Public Service approach to reach out to the project beneficiaries. The comprehensive blueprint led to the setting up an inhouse Innovation Lab to deliver monetary and advisory services through integrated digital technologies (Cloud, Mobile and GIS) in meeting the project objectives. The application of new media technologies have paid rich dividends in reaching out to the beneficiaries during the unprecedented pandemic, laying the foundation for its mainstreaming in other government programs, now and in future.

PoCRA Direct Benefit Transfer portal and mobile application allow farmers to apply for matching grants for their farm-level investments aimed at improving incomes. The DBT portal is a workflow-based end to end online system through which the project officials can verify the eligibility and assets created and transfer the matching grants directly to the farmer's Aadhar linked bank account. Another module of this portal allows the farmers' collectives to receive matching grants for their value chain based agribusiness proposals.

The village water balance framework, developed by IIT Bombay, helps the village community to understand the current status of their natural resources. **The microplanning app helps the community in this process by providing best and worst case scenarios and various options for sustainable cropping pattern and natural resource management.** New **soil and water conservation works, identified by the village community through the microplanning exercise, are implemented with the help of the** natural resource management portal.

The farmer field school (FFS) app enables facilitator-led peer to peer learning among farmers about climate-resilient technologies and monitors their adoption. Capacity building app enables reaching out to identified stakeholders and ensures their participation in project sponsored events like training, exposure visits, meetings, and workshops.

The project has initiated the generation of block-level Agro-Met advisories to enable the farmers to respond to the weather conditions in the most appropriate manner. These advisories are accessible not only to the farmers in the project villages but to all the farmers in the project districts.

Executive Summary (2/2)

A GIS-based planning and decision support system provides easy access to customised maps and helps in the visualization of soil, water, and weather-related parameters. The geo-spatial visualization of project activities and interventions helps in monitoring and decision making.

The IT system has ensured minimal disruption in project activities during the pandemic by allowing the stakeholders and project functionaries to 'Work from Home'. The project strategy of making investments in the IT system has resulted in substantial gains in efficiency and has kept the project management costs below 8% of the total project expenditure.

The project is being directly implemented by the Department of Agriculture, Government of Maharashtra. The need to improve the capacities of the project functionaries to provide timebound and quality services to the key project stakeholders was identified at the time of project design stage itself. The project has carried out capacity enhancement and need assessment (CENA) exercise to identify their training needs and addressed them through a multipronged approach of exposure visits, workshops, experience sharing, and training. To enhance the productivity of the staff, many of the current processes have been optimized and a single sign-on based access system has been developed. Applications like FAST and FIMS allow close supervision of field related activities and project expenditure. The PoCRA IT initiatives can easily be replicated and scaled up for the whole of the state because of the digital architecture adopted by the project.

As the project completes half of its duration, the farming community has started reaping the benefits of investments supported by the project at the individual farmlands, community lands, and in the agriculture value chains. Going forward, the project aims to have even closer engagement with the farmers through a user-centric service portal and learning management system.

About

- World Bank funded Project on Climate Resilient Agriculture in Maharashtra (PoCRA)

Components

- Promoting Climate-resilient agricultural Systems
- Post-harvest Management & Value Chain Promotion
- Institutional Development, Knowledge & Policies

Beneficiaries

- Farmers
- Farmers collectives (FPO/FPC/SHG)
- Village Communities

Project Interventions

- Infrastructure at farm level
- Infrastructure for management of natural resources
- Infrastructure for post harvest
- Climate Resilient Technologies

Collaborations developed

- ICAR institutions
- IIT B, IMD, TISS, GIPE
- Agencies under State Government

Current IT components

- Service delivery apps
- Capacity building apps
- Advisory services
- Monitoring tools/apps

IT Roadmap

- PoCRA portal
- Farmer application
- Learning management system
- Agri data marketplace

1

Digital Initiatives for Climate Resilient Agriculture

Implementation of digital initiatives in climate-resilient agriculture has benefits for citizens as well as implementation machinery of the government. Digital technologies allow users to share and access information at the point of use and enable government functionaries to monitor, track and provide approvals to the activities efficiently which improve the quality of these services. Accordingly, the effective implementation of IT initiatives reduce the cost, effort, complexity and time taken by organizational processes by streamlining and re-engineering operating procedures.

By using well-designed digital tools, users get reliable, consistent, transparent and easier access to services. Government officials can save time in seeking, collating, and compiling information, freeing up time for improving service delivery

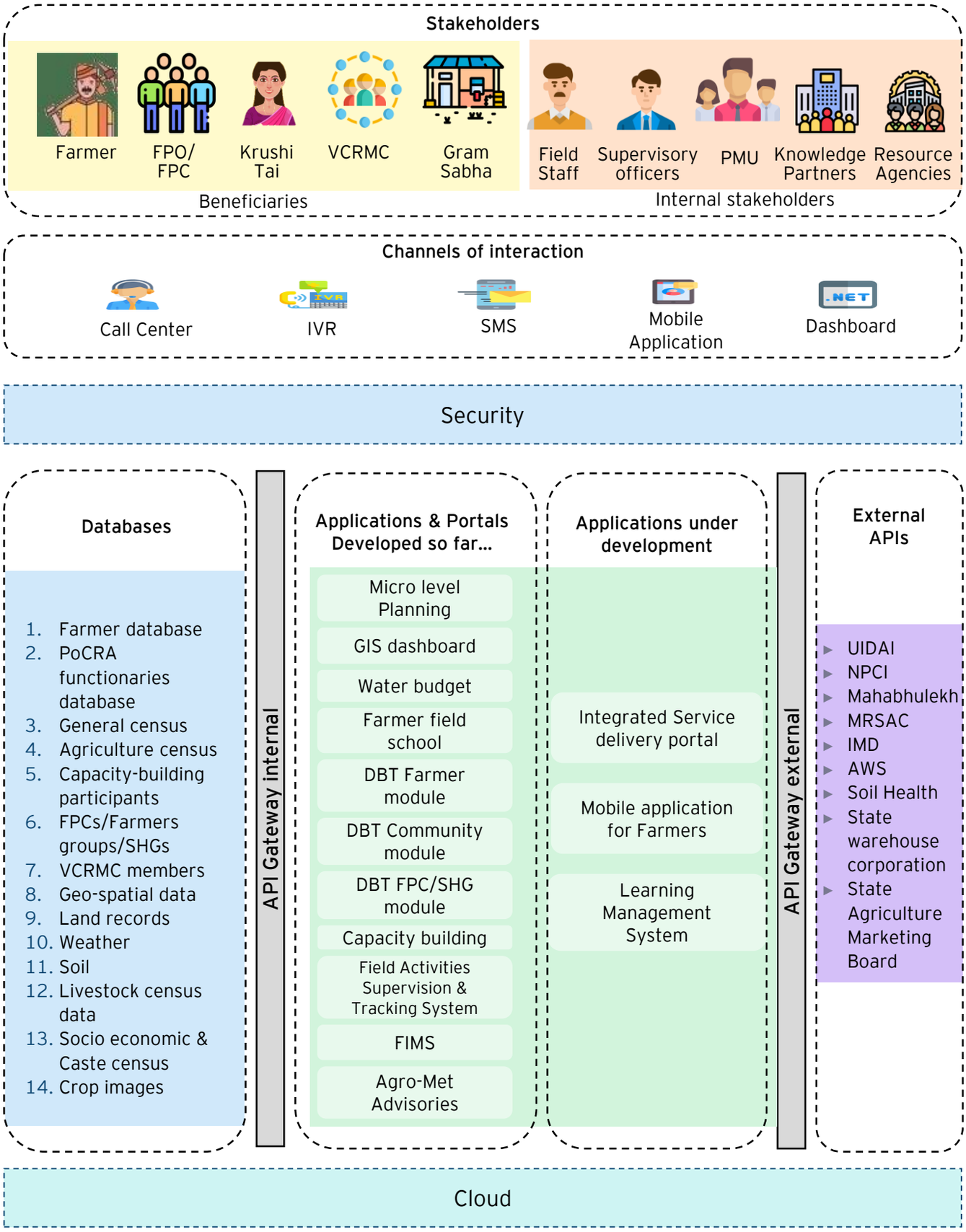
New, sophisticated technologies such as geospatial and satellite data, Image-processing, Artificial Intelligence and Machine Learning, sensors and Internet-of-Things are now accessible to all, through cloud-based services. Such technologies, assembled smartly, can provide real-time farm advisories based on weather forecasts, market prices, pest incidences, impending disasters, etc.

Effective implementation of digital initiatives enable farmers to optimize their crop cycles, resulting in increased income and also equipping them to handle climate impacts, thus reducing their costs and risks.

Principles behind PoCRA's digital architecture

1. Open-standards
2. Building ecosystems
3. Loose coupling
4. Improving data quality
5. Structured data-sharing
6. Ensuring Data privacy
7. Cloud-first
8. Mobile-enabled
9. Open-source
10. Geo spatially enabled
11. Intuitive / Easy to use

Digital architecture of PoCRA

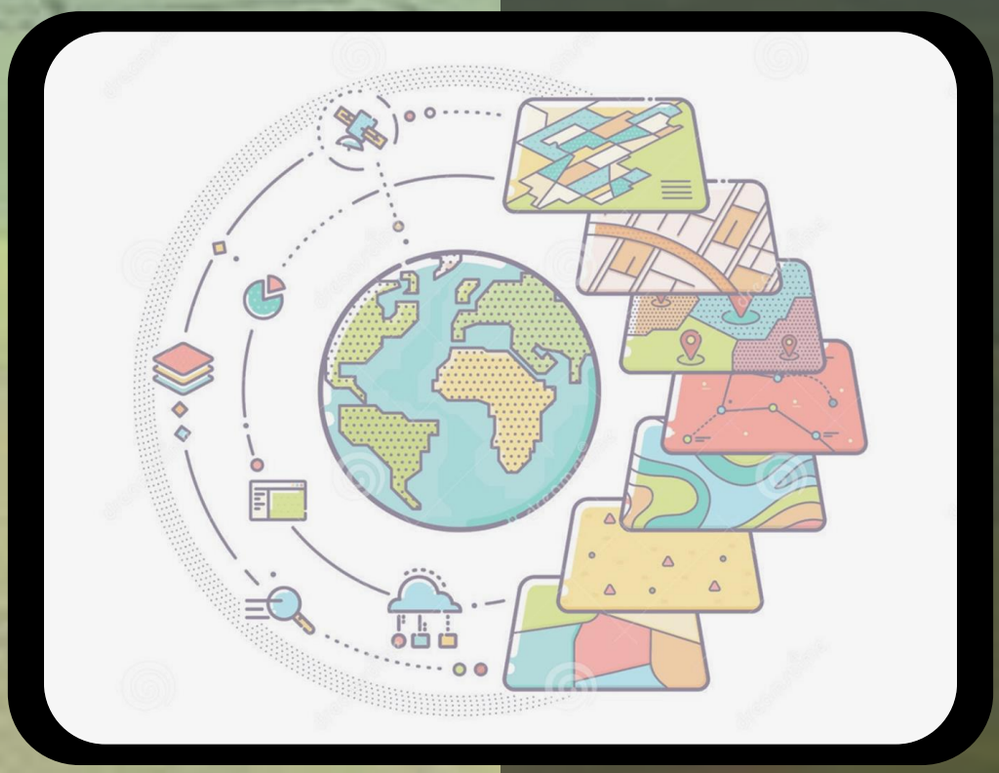


The digital interventions are centred on 3 themes…

A GIS driven planning and decision making

Bringing transparency, accountability, and efficiency in service delivery B

C Scaling up extension



A

GIS driven planning and decision making

Project villages and sites for new works were selected by analysing multiple GIS data sets…

Overview

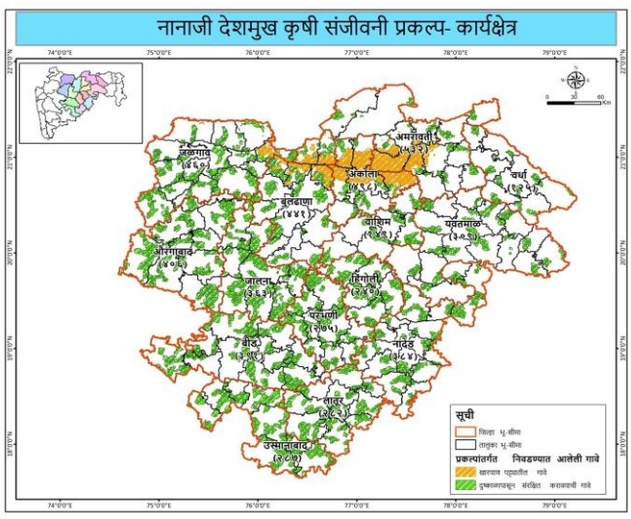
Village clusters are demarcated based on watershed boundaries derived from the geospatial data. Cluster vulnerability index was calculated based on their climate exposure, sensitivity, and adaptive capacity. The most vulnerable clusters were selected under the project.

Features

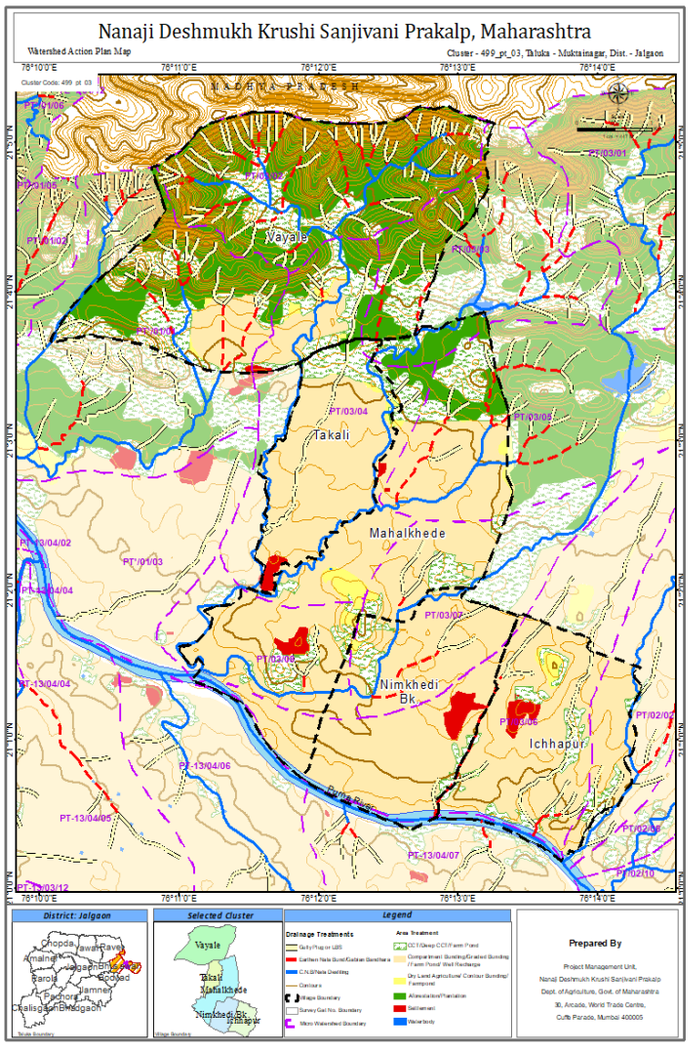
Integration of data from different databases including weather, general census, agriculture census, livestock census, socioeconomic caste census, groundwater prospects, soil quality, crop yield, land use/cover, and occurrence of drought. These parameters are overlaid on a geo-spatial layer to generate vulnerability index of each cluster.

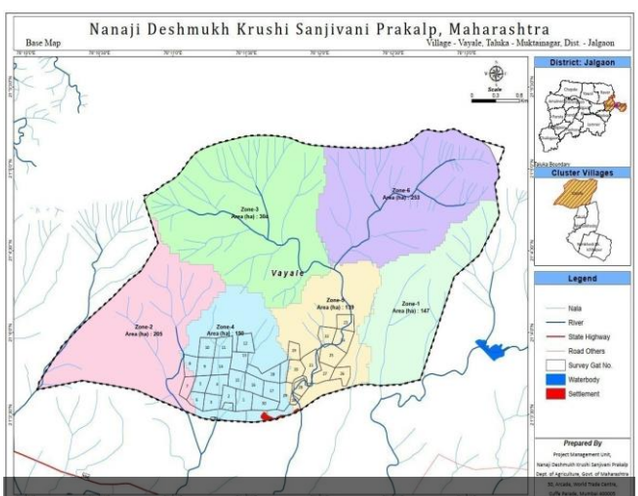
Benefits

- Prioritization of funds for the most vulnerable clusters and focussed interventions for enhancing resilience
- Efficient and sustainable utilization of natural resources.
- Focus on the most stressed watersheds.



Map displaying 5,142 identified villages in PoCRA. The villages marked in orange are part of the sodic and saline belt of the Purna river in the districts of Amravati, Akola, Buldhana, and Jalgaon. Villages in green are other vulnerable villages.



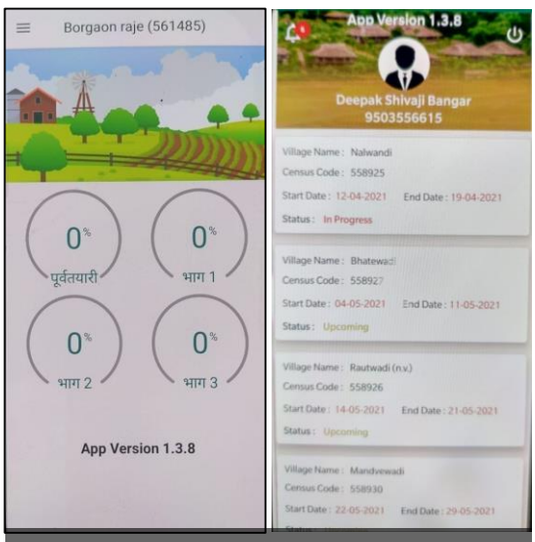


Each village is divided into hydrological zones to calculate its water balance. Water balance status guides the community to plan for new soil and water conservation works and appropriate cropping pattern.

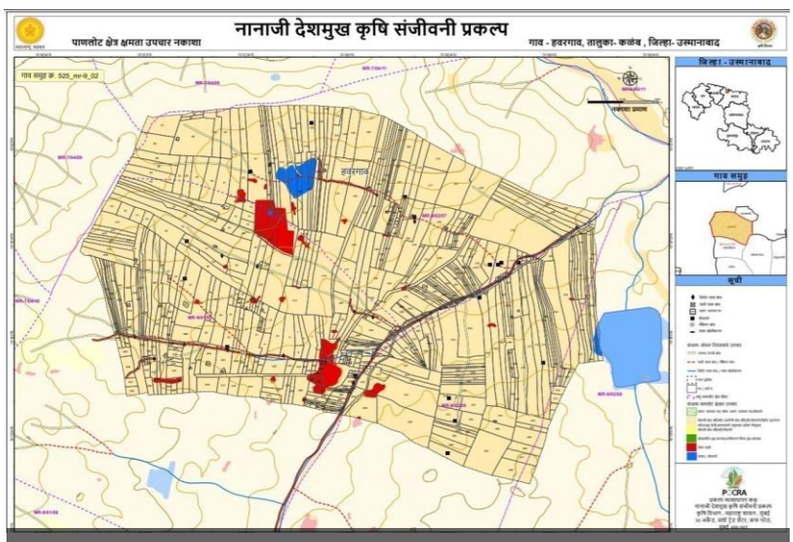
Prior identification of location/area where village-level activities can be implemented gives insights to the survey team to identify the potential areas for new works. Parameters used to generate such potential treatment maps include soil depth, soil texture, soil erosion, land use/cover, slope, drainage, contours, etc. The map above shows prospective locations in one of the clusters of Muktainagar Taluka of Jalgaon District.

Community-led micro-level planning was enabled through mobile application

Overview	Features	Benefits
Micro level planning is a community led initiative to plan for various activities under the project as per local needs.	Micro level planning app assists the community in the 3-day planning exercise to prepare the village plan based on: ▸ Socio-economic status of village ▸ Natural resource utilization ▸ Cropping pattern ▸ Integration in value chain	▸ Easy to use application for the village level functionaries ▸ Calculate water balance of the village and suggest measures for optimum utilization of natural resources ▸ Automated engine at the backend, processes the data and generates the village development plan



Screenshots of the application



Base Map of Hiwregaon, Taluka: Kalamb, District: Osmanabad

Micro-level planning is the foundation of the village level interventions under PoCRA. A rough map drawn by community showing major roads, water bodies, and other landmarks of a village can be seen which is created using PRA techniques during the microlevel planning process.

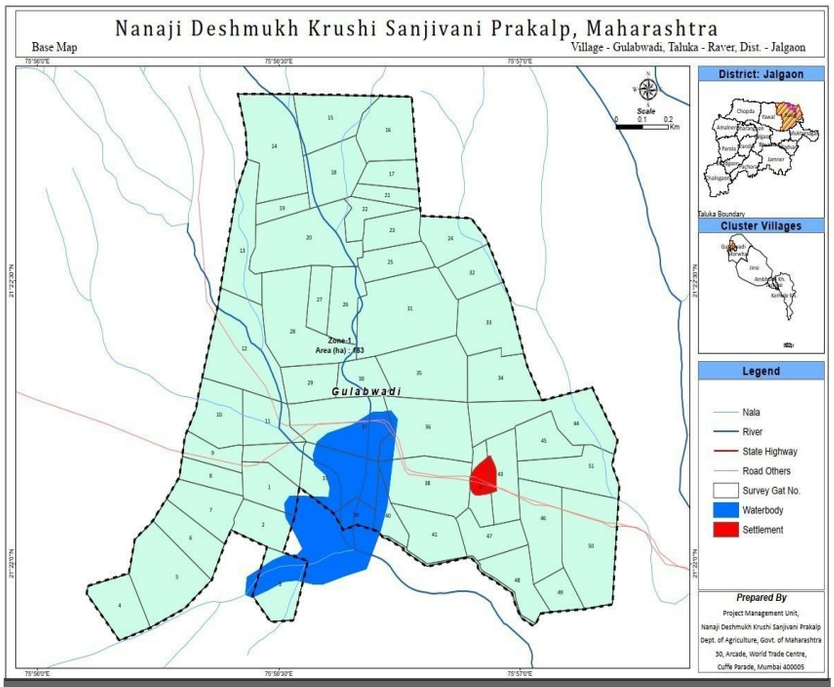
A "Transect Walk" (Shivar Feri) is one of the core components of MLP activity. It helps the community to identify the current status of natural resources in the village. A "Shivar Feri" is being taken out in the village "Hiwregaon" during MLP activity.

Water balance boards helped communities to plan project supported interventions

पाण्याचा ताळेबंद: सारांश (वर्ष – 2019)

	पावसाच्या पाण्याचे गणित		
१	गावाचे एकूण क्षेत्र (हेक्टर)	536	
२	पावसाचे पाणी (कोटी लिटर)	303	
३	पावसाळ्यात पिकाने घेतलेले पाणी (कोटी लिटर)	197	
४	भूजल पुनर्भरण (कोटी लिटर)	3	
५	मातीतील ओलावा (कोटी लिटर)	38	
६	गाव शिवारातून निर्माण झालेला अपधाव (कोटी लिटर)	65	
७	गाव शिवारात अडविण्यासाठी उपलब्ध अपधाव (कोटी लिटर)	32	
८	गाव शिवारात आतापर्यंत अडवलेला अपधाव (कोटी लिटर)	8	
९	अडविण्यासाठी शिल्लक अपधाव (कोटी लिटर)	25	
१०	**प्रस्तावित कामांनंतर अडणारा एकूण अपधाव (कोटी लिटर)**	**13**	
	पिकाची पाण्याची गरज आणि उपलब्धता	**पावसाळ्यातील**	**पावसाळ्यानंतर**
११	पिकाची पाण्याची गरज (कोटी लिटर)	219	108
१२	पिकाला मिळालेले पाणी (कोटी लिटर)	192	23
१३	पिकाला ओलितायी गरज (कोटी लिटर)	27	86
१४	अडवलेला अपधाव (कोटी लिटर)	4	4
१५	उपलब्ध भूजल (कोटी लिटर)	1	2
१६	**सध्यस्थितीत पाण्याचा ताळेबंद**	**-22**	**-80**
१७	एकूण तुट (कोटी लिटर)	-102	
	प्रस्तावित कामांनंतर पाण्याचा ताळेबंद		
१८	**सध्याच्या पिकपद्धतीनुसार प्रस्तावित कामे केल्यानंतरची तुट (कोटी लिटर)**	**-96**	

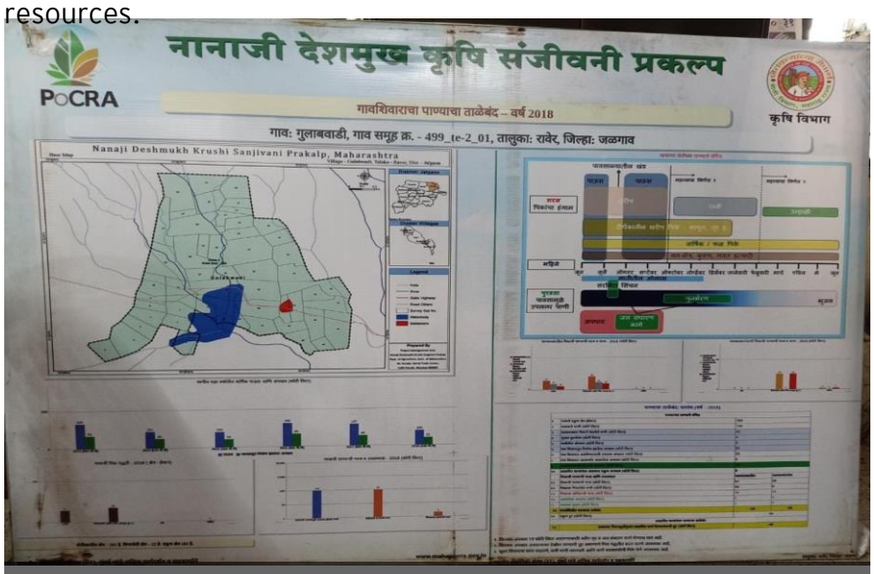
Water budget table



Base map of the village Vayale, Taluka Muktainagar, District Jalgaon

A water balance framework prepared by IIT Bombay takes into account the geographical features of village like slope, drainage pattern, soil texture, land use, cropping and weather pattern, current state of natural resource management, groundwater availability, and requirement of water for humans, livestock and agriculture. The water runoff calculation indicates potential for optimal water harvesting.

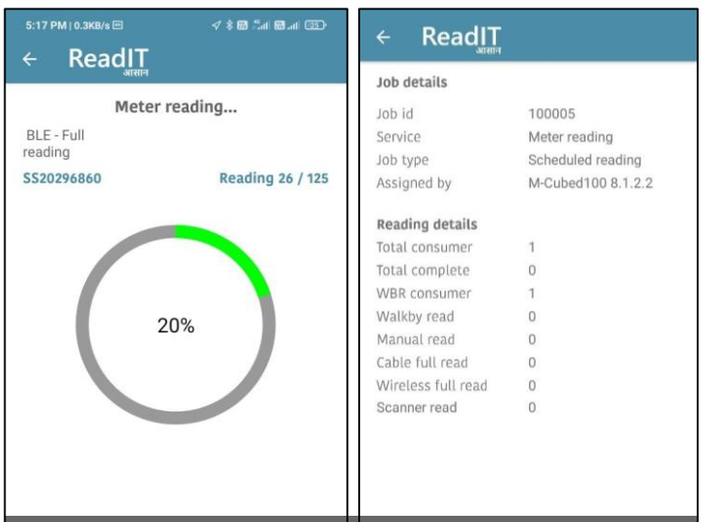
The supply and demand for water are then presented to the community in an easy to understand chart along with suggested interventions for new water harvesting structures, enhancing water use efficiency through micro irrigation systems, and appropriate cropping pattern. This is helping the village community to make informed decisions and common action for sustainable use of the available natural resources.



To initiate an informed discussion among the village community about the importance of water conservation and appropriate use of water, PoCRA has installed water balance information boards in all the project villages.

IoT-based sensors were used to monitor and validate water and energy use

Overview	Features	Benefits
Use of IoT for validation and real time assessment of water balance and energy efficiency	▸ Water & energy usage being monitored through Water meter & Energy meter ▸ Soil moisture sensor collects real time moisture level ▸ Data captured, stored offline and synchronized with server	▸ Real time data collection ▸ Reduces human touch points ▸ Remote monitoring ▸ Maintains data integrity



Meter reading application

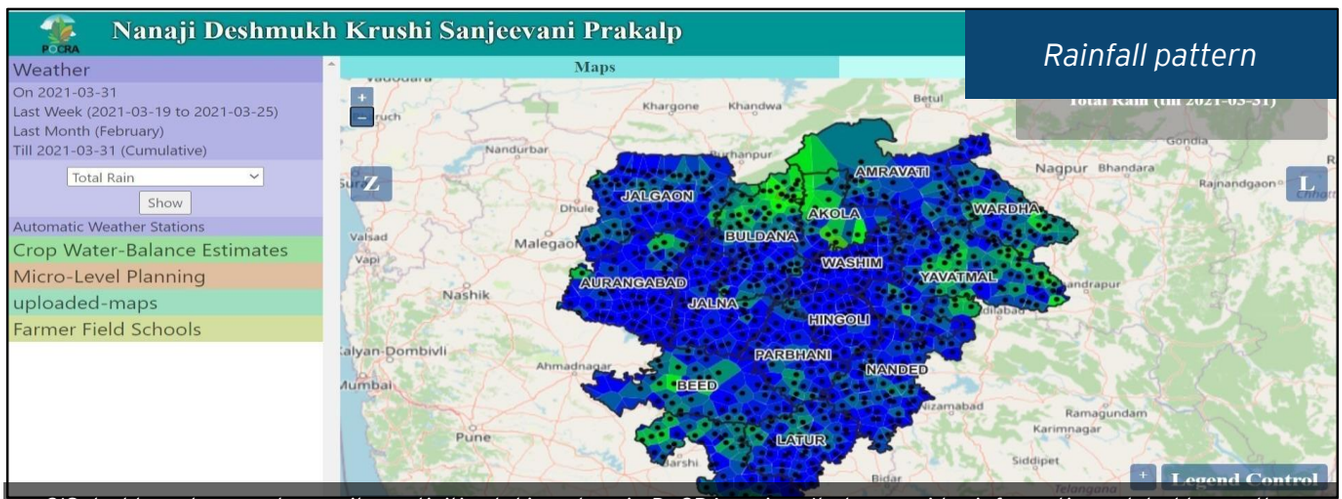
Water meter installed in field

Energy meter captures the readings	Bluetooth transmits the readings to mobile app	Data uploaded on meter reading app	The readings are transmitted using internet connection	Readings analysed by the system

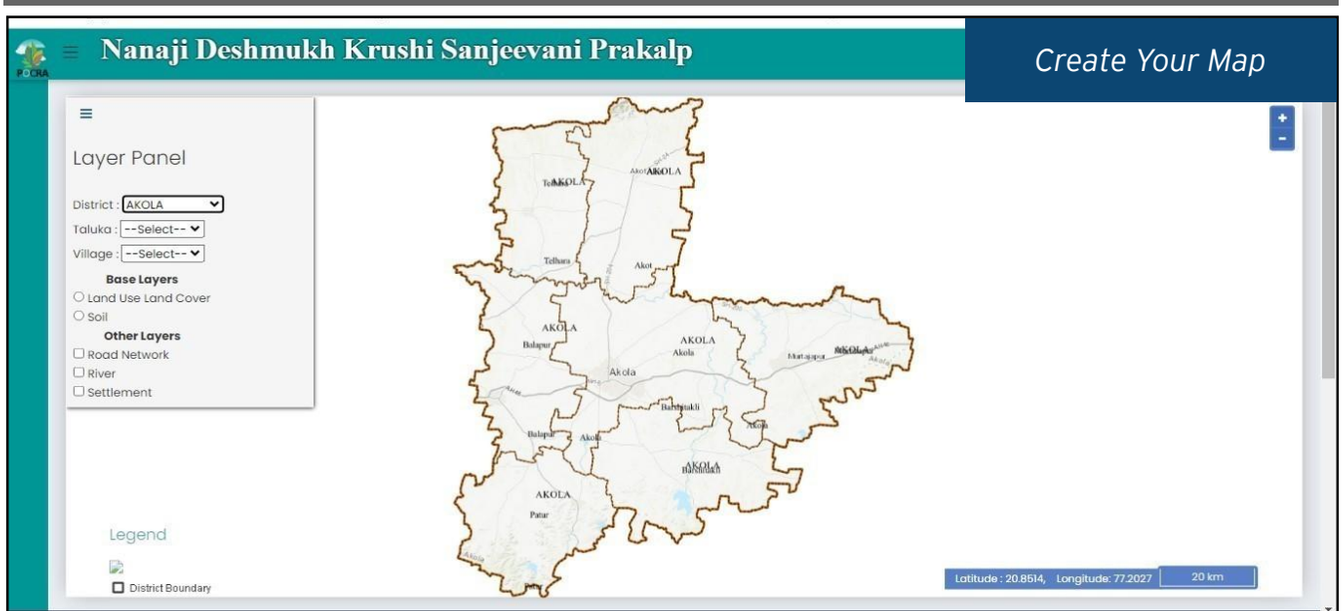
Flow of data from meter to the system

A GIS dashboard was developed to visualise all PoCRA activities in an integrated manner...

Overview	Features	Benefits
GIS dashboard allows visualization of the project activities. It helps in monitoring of the ongoing activities and decision making.	▸ Single dashboard to visualize all PoCRA activities ▸ Platform to disseminate information related to weather and crop health	▸ Dashboard provides an overview of parameters such as spatial distribution of date of sowing, harvesting, storage, crop yield etc. ▸ Intelligent queries on weather, crop health, etc. assist in better decision making. ▸ Dashboard also provide details of ongoing project activities.



GIS dashboard serves to monitor activities taking place in PoCRA region. It also provides information related to weather forecast and rainfall data on nearly real-time basis. The above image provides the details of rainfall pattern in the project region.



A functionality is created within the GIS platform through which a user can generate a customized map based on the required parameters. Such maps can be generated for any district, taluka or village in PoCRA region.

GIS and remote sensing technology were used at scale for monitoring crops

Overview

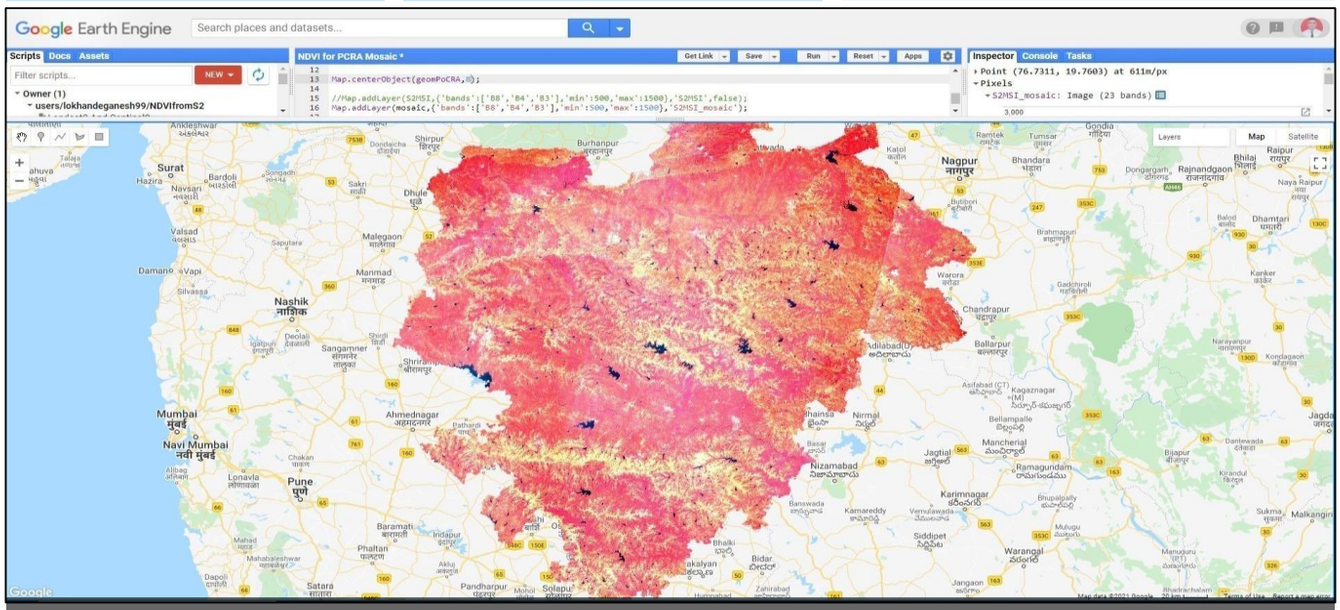
GIS and Remote Sensing technology enable monitoring of rainfall, cropping pattern, risks, crop health, and vegetation cover.

Features

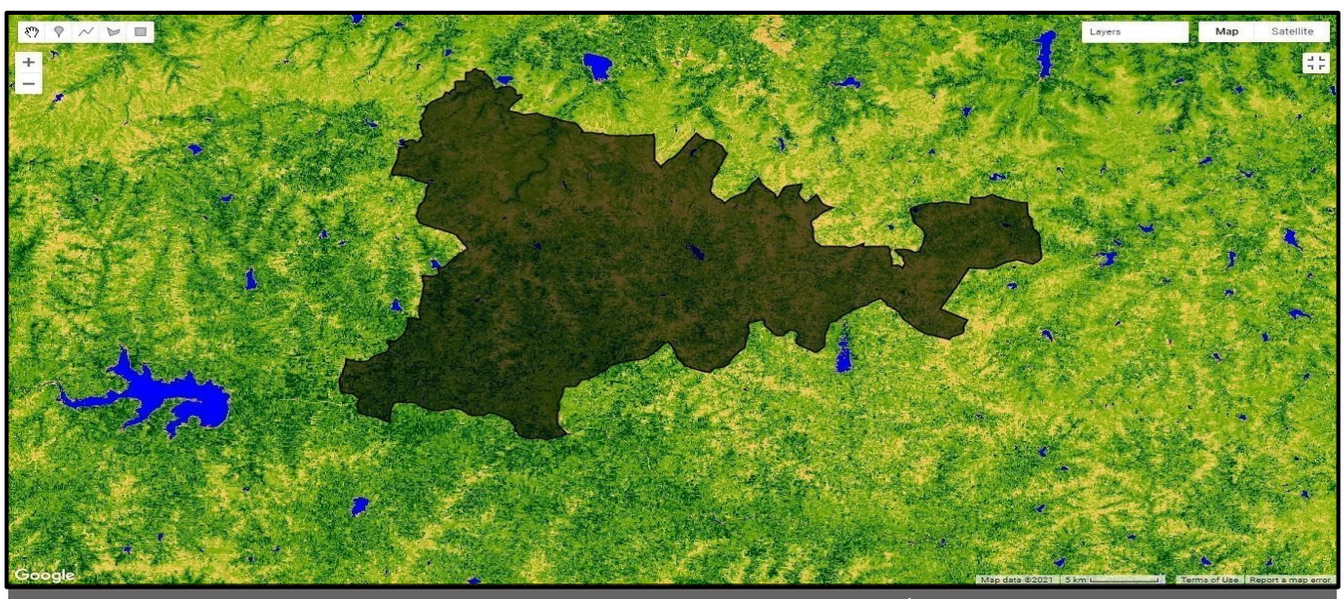
- Calculation of indices like normalised difference vegetation index (NDVI), normalised difference water index (NDWI), and moisture adequacy index (MAI)
- Visualization of areas under risk
- Combining remote sensing and ground truth data

Benefits

- Monitoring of entire crop cycle from sowing to harvesting
- Various indices like crop condition, vegetation cover, rainfall, etc. can be mapped in multiple layers
- Combining this information with weather data received from IMD & AWS and on-ground data helps in generation of advisories



Google Earth Engine provides temporal (periodical) images from multiple satellites which are analysed to derive indices such as NDVI, NDWI, and SAVI. A Sentinel-2 satellite imagery visualization of False Colour Composite (FCC) created on Google Earth Engine (GEE) platform for PoCRA region is displayed above.



NDVI provides information of vegetation which helps in identification of crop stress/damage or potential drought situation. NDVI index for Ambejogai taluka of Beed district is displayed above.

B

Bringing transparency, accountability, and efficiency in service delivery

A DBT portal was developed to quickly and easily deliver cash transfers to farmers

Overview

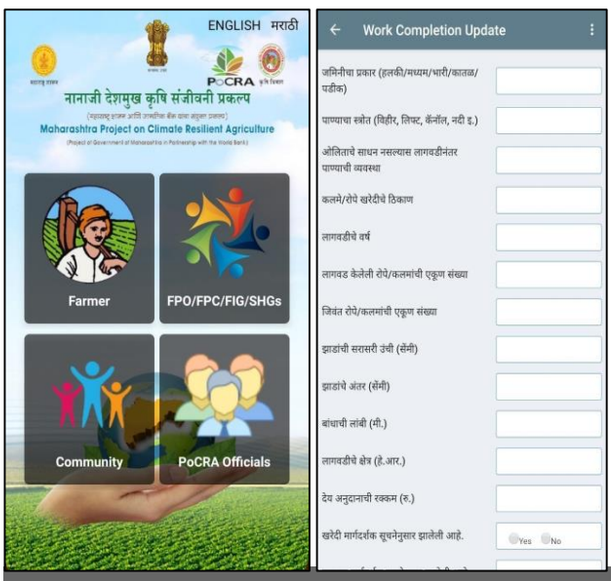
Portal developed for farmers to register and apply for financial assistance under the project

Features

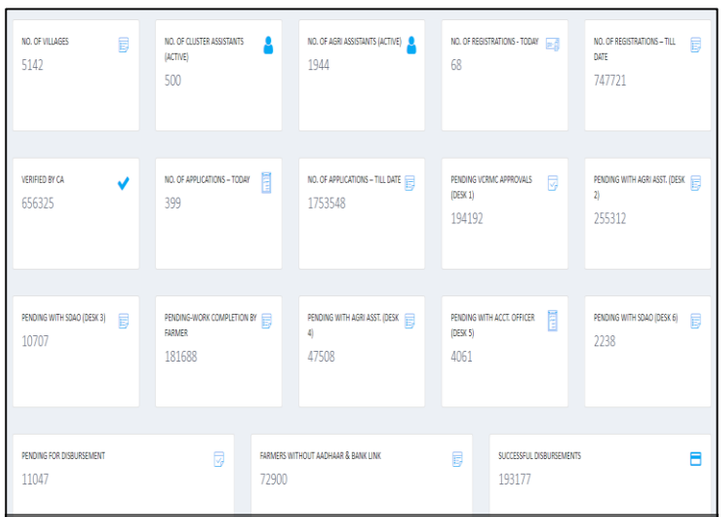
- Workflow based system for application, processing and disbursement of assistance
- Disbursement through Aadhaar enabled payment system
- Geo tagging of all the activities
- Realtime tracking & monitoring

Benefits

- 100% paperless approval process
- Faster approvals
- Real time monitoring
- Eliminates intermediaries
- Establishes credibility of implementation agency
- Transparency in operation
- Establishing accountability
- Direct benefit transfer



Screenshots of the application



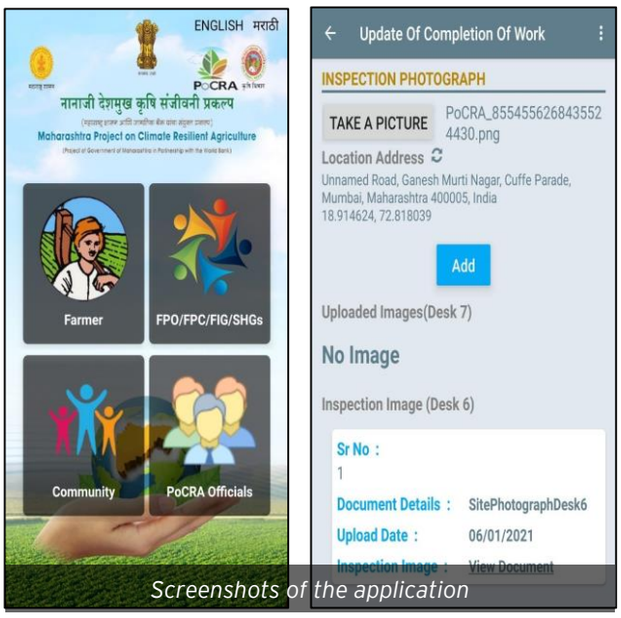
Dashboard of Farmer module of DBT application displays number of applications made by farmers and subsequent stages of approval, verification, and disbursement.

Assets constructed by the farmers are physically verified by the project officials who capture geotagged photo and other details through the app before disbursements of matching grants.

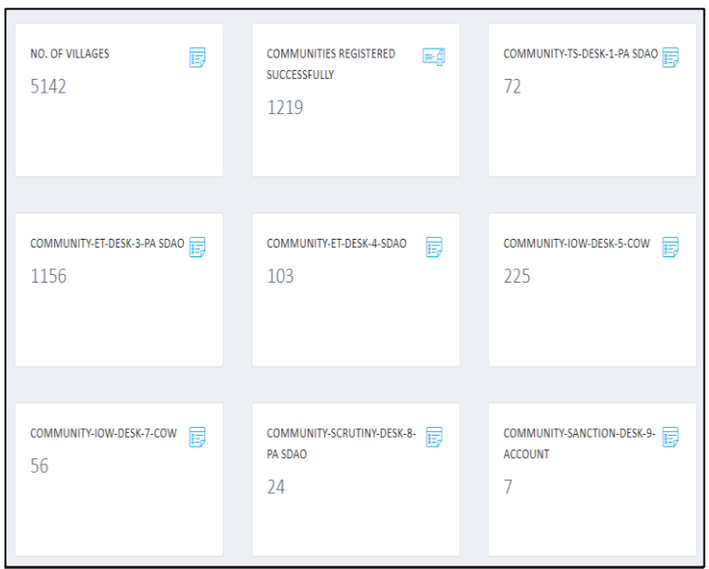
To create livelihood opportunities for the landless applicants, PoCRA provides financial assistance for activities like apiculture. PoCRA DBT app allows them to choose an activity from a basket of options and apply online.

DBT portal (NRM module) helped communities execute soil & water conservation works

Overview	Features	Benefits
Village level communities can apply for financial assistance to carry out natural resource management works as per the Village Development Plan	▸ Activities approved under the VDP can be undertaken ▸ Functionality to register village level communities ▸ Selection of vendors through e-tendering ▸ Online inspections, recording of measurements and payment ▸ Geo tagging of assets created	▸ Timely approvals ▸ Funds disbursement directly to the bank accounts of agency executing the work ▸ Real time monitoring and mapping of each activity on integrated GIS platform



Screenshots of the application



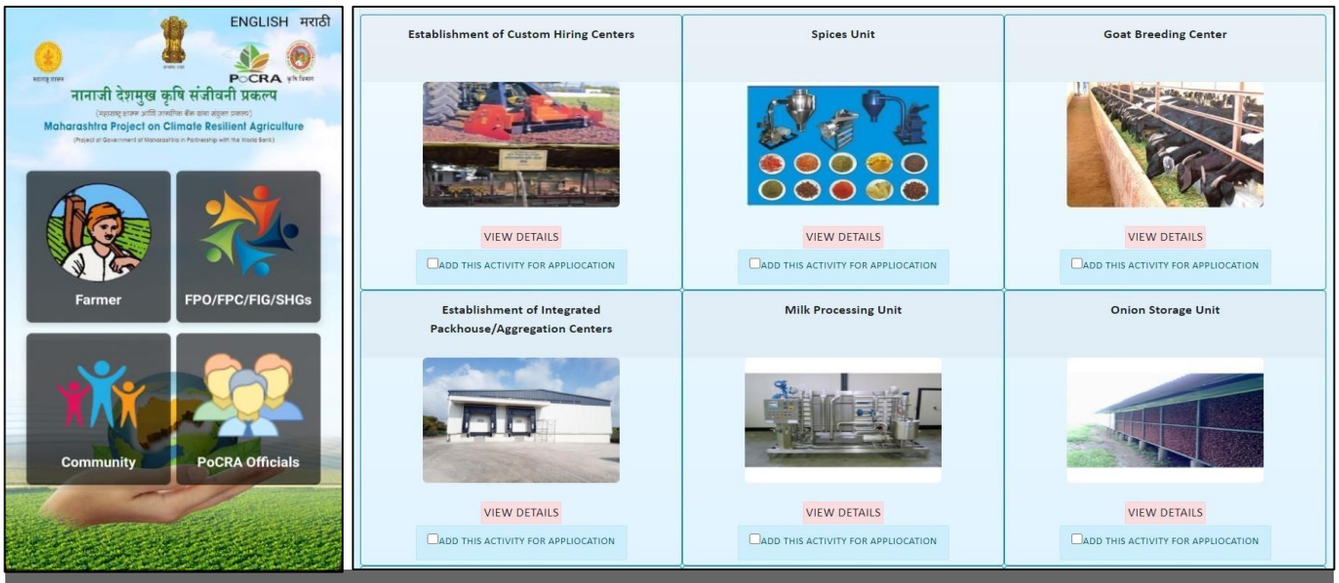
NRM Dashboard displays the status of NRM activities

Soil and water conservation is very important to increase the groundwater level. Contour trenches help in arresting the rainwater and increase its infiltration. NRM app allows monitoring of such works right from the planning stage.

Recharge shaft helps in maintaining ground water levels by directly recharging the shallow aquifer. NRM portal helps mapping of these works on a geo-spatial layer and update the NRM database.

The DBT portal was expanded to serve Farmer Producer Organizations & Self Help Groups

Overview	Features	Benefits
Portal for FPOs/FPCs/SHGs to apply for financial assistance to implement their business plans about post-harvest processing, seed supply chain, and custom hiring centre	▸ Workflow based system for application, processing, inspection, approval and disbursement of assistance ▸ Direct transfer to the bank account / loan account of FPC/FPO/SHG ▸ Geo tagging of all the activities ▸ Realtime tracking & monitoring	▸ 100% paperless approval process ▸ Faster approvals ▸ Transparency about status and decision making process ▸ Eliminates intermediaries ▸ Establishes credibility of implementation agency ▸ Real-time monitoring ▸ Direct benefit transfer



Screenshots of the application

PoCRA provides financial assistance to FPOs to implement their business plans. The project officials verify the assets created by the FPO and capture details of the work in the DBT portal before recommending disbursement of matching grants.

PoCRA also supports farmers' groups in setting up agriculture commodities processing units and enhance income of its members. Daal (pulses) processing unit set up by a farmers group is being visited by project officials.

Field Activities Supervision and Tracking System (FAST) made monitoring easier

Overview

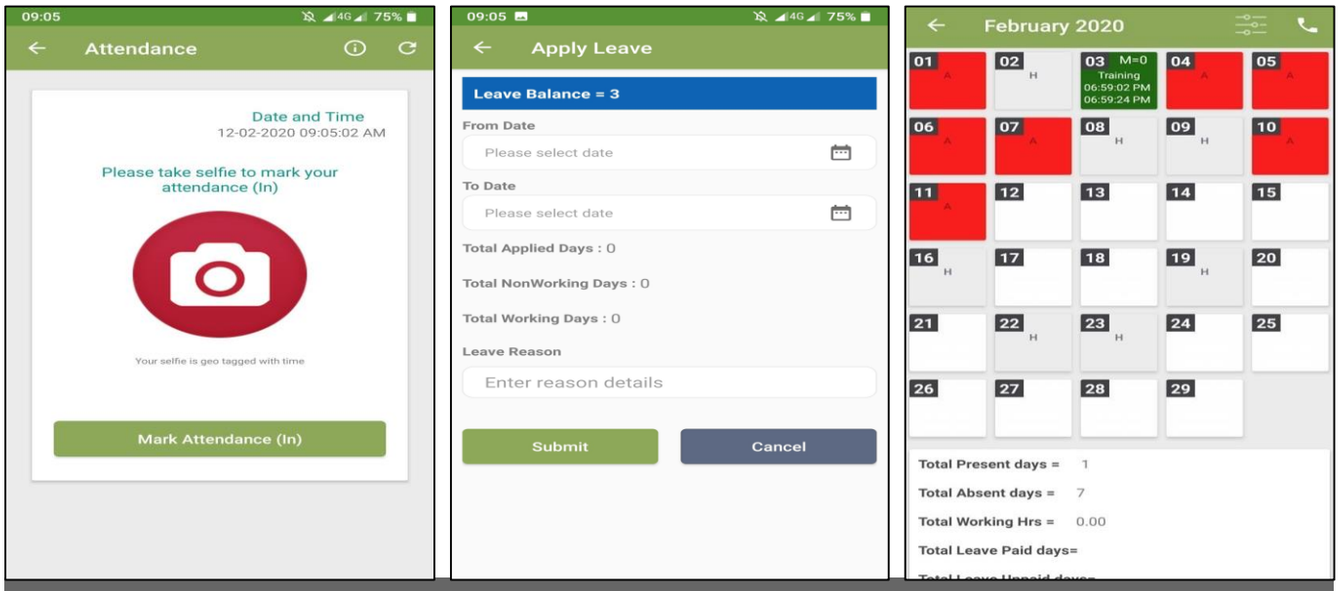
GIS based application to mark attendance, manage leave and calculate salaries of PoCRA staff. It also allows data collection at village level and information dissemination.

Features

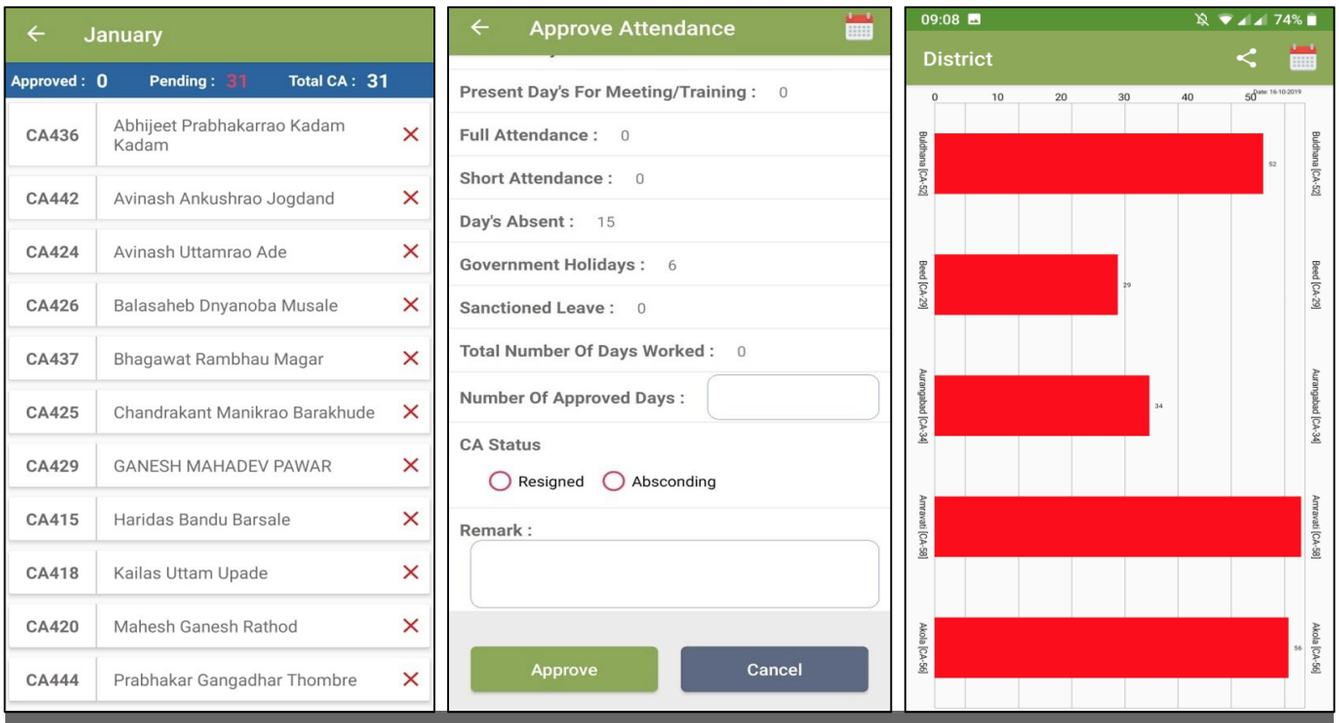
- GIS based application to mark attendance of field officials
- Leave management, approvals & salary calculations in simple steps
- Centralized platform for PMU officials to monitor field officials

Benefits

- Easy monitoring of the field staff
- On the go approval mechanism regarding leave and salary by higher authorities
- Trusted utility by field and supervisory officials.



Screenshots of the application for the staff



Screenshots of the application for approving authority and PMU

Finance Information Management System (FIMS) helped in keeping control over funds

Overview

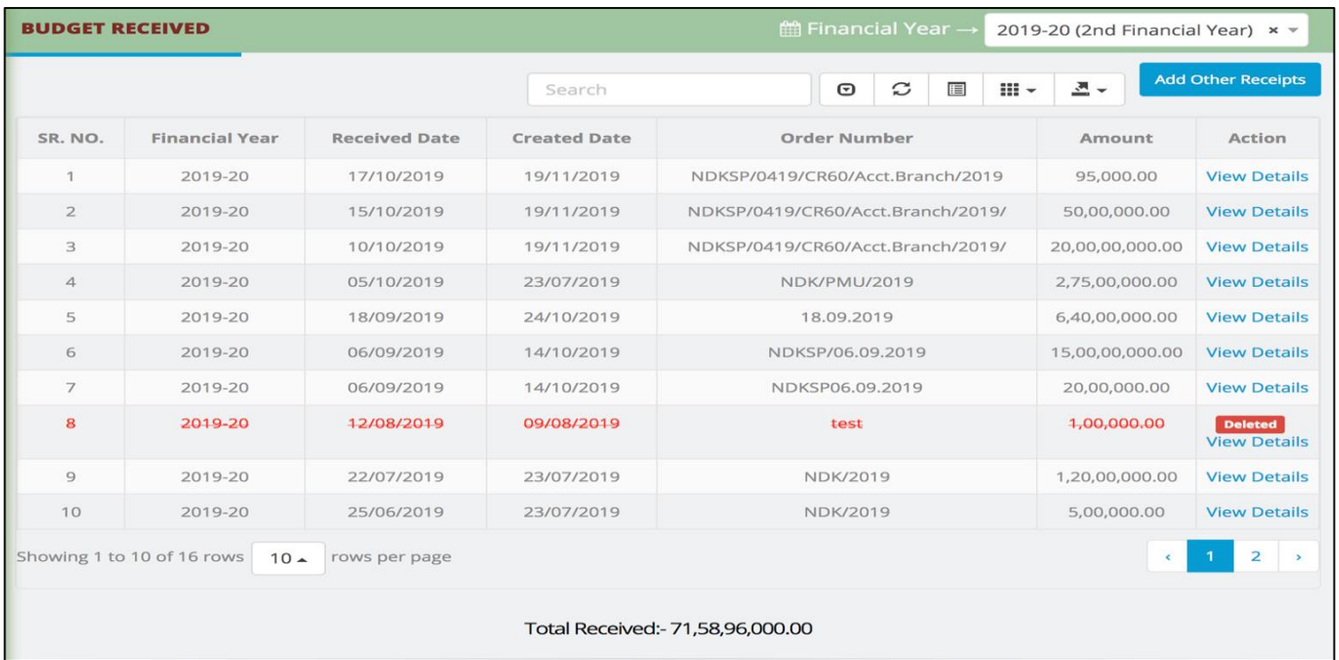
Application to allocate budget, monitoring, booking & tracking of expenditure and financial reporting. It tracks receipts and expenditure at all the 67 accounting centres.

Features

- Application gives functionality to allocate budget from PMU to offices till VCRMC level
- Realtime tracking & monitoring of allocated funds
- Functionality to manage and track expenditure and receipts

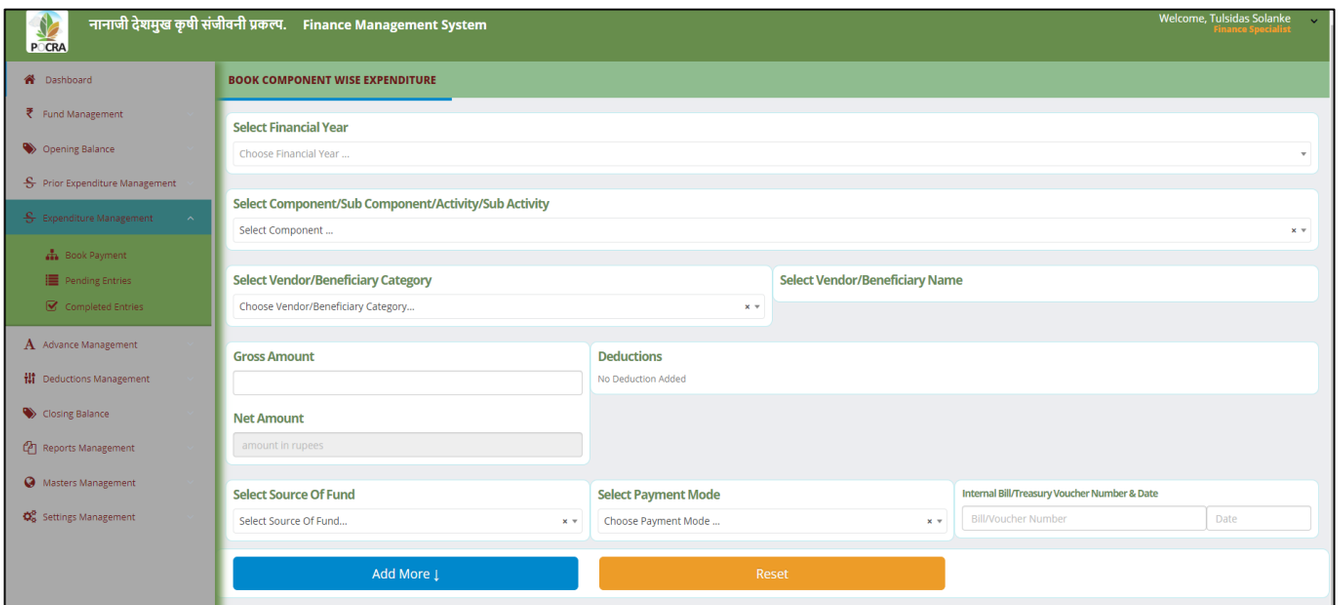
Benefits

- Single platform to capture all the expenses and seamlessly generate real-time reports
- Efficient utilization of available funds



SR. NO.	Financial Year	Received Date	Created Date	Order Number	Amount	Action
1	2019-20	17/10/2019	19/11/2019	NDKSP/0419/CR60/Acct.Branch/2019	95,000.00	View Details
2	2019-20	15/10/2019	19/11/2019	NDKSP/0419/CR60/Acct.Branch/2019/	50,00,000.00	View Details
3	2019-20	10/10/2019	19/11/2019	NDKSP/0419/CR60/Acct.Branch/2019/	20,00,00,000.00	View Details
4	2019-20	05/10/2019	23/07/2019	NDK/PMU/2019	2,75,00,000.00	View Details
5	2019-20	18/09/2019	24/10/2019	18.09.2019	6,40,00,000.00	View Details
6	2019-20	06/09/2019	14/10/2019	NDKSP/06.09.2019	15,00,00,000.00	View Details
7	2019-20	06/09/2019	14/10/2019	NDKSP06.09.2019	20,00,000.00	View Details
8	2019-20	12/08/2019	09/08/2019	test	1,00,000.00	Deleted View Details
9	2019-20	22/07/2019	23/07/2019	NDK/2019	1,20,00,000.00	View Details
10	2019-20	25/06/2019	23/07/2019	NDK/2019	5,00,000.00	View Details

Receipt of funds



Booking of expenditure

KPI monitoring system inspired project teams through objective benchmarking

Overview

System to monitor the performance of subdivisions, talukas, and gram panchayats against key project activities.

Features

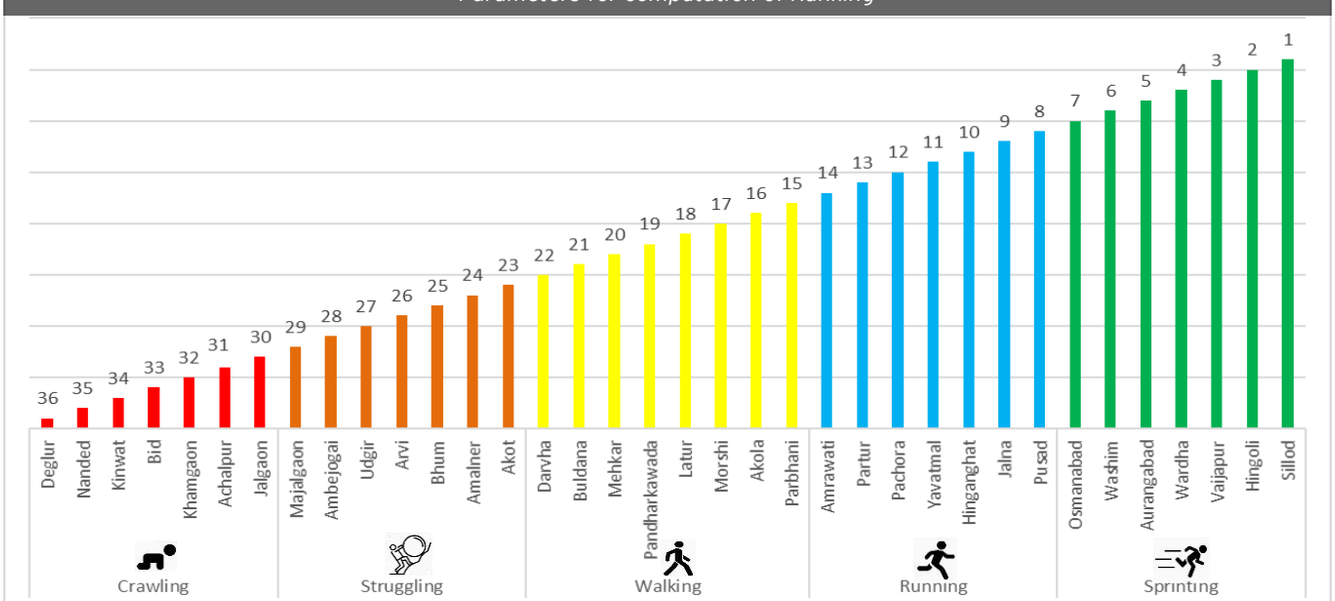
- Graphical representation of results
- Breakdown into individual component wise reports
- Ease of representation, analysis and monitoring
- Dynamic and flexible enough to incorporate new parameters periodically (e.g., quarterly)

Benefits

- Creates an environment of competition amongst sub-divisions and talukas, resulting in improved performance
- Transparent analysis helps to identify the areas that need attention and take necessary corrective actions

Sr. No	Indicator	Overall weights(%)	Parameters	Measured as
1	DBT Status	35	Registrations	% to landholders
			Presanctions Applications	% to landholders
			Disbursement Application cases-Male	% to total disbursed appliccations cases-Male
			Disbursement Application cases-Female	% to total disbursed appliccations cases-Female
			Average time taken for Disbursement	Number of days
2	NRM Works Status	15	No. of Tech. sactioned works	% to project tech. sanctions
			No. of E-tendered works	% to tech. sanctions
			No. of completed works	% to E-tendered works
3	MLP Status	10	Inprogress and completed MLP	% to MLP Scheduled
4	FFS Status	15	No. of FFS conducted	% to No. of FFS to be conducted
			No. of Participants (Host +Guest)	Average no of Participants
			No. of female Participants	% to No. of Participants (Host +Guest)
			No. of Plot with Geo-fencing (As per GIS)	% to No. of FFS conducted
			No. of plot with sowing date filled correctly	% to No. of FFS conducted
			No. of Plots with crop yield filled (kharif)	% to No of Kharif FFS plots
5	Support to FPOs	15	No. of FPO presanctions	% to project presanctions
			No of FPOs proposals disbursed	% to presanctions
			No. of FPCs assessed	% of FPcs to be assessed
6	Training	5	No. of events conducted	% to project total events
			No. of Participants	Average no of Participants
			No. of female Participants	% to No. of Participants
7	Finance	5	Expenditure (In Thousand)	% to Released amount (In Thousand) to Subdivision
	Total	100		

Parameters for computation of Ranking



Ranking of subdivisions and talukas based on their performance in project activities helps in their objective assessment.

Village Agriculture Development Profile provides real-time information to everyone

Overview

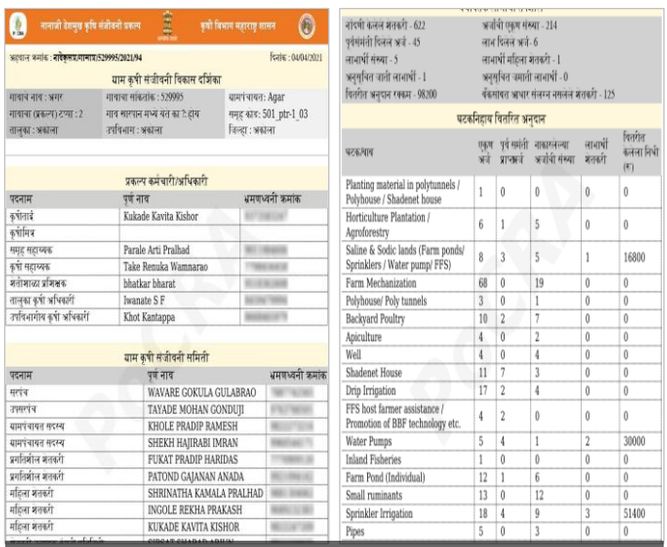
Data from all the applications is represented in a single report giving an overview about the status of project activities in a village.

Features

- The village profile collects data from DBT portal (individual farmer, NRM, and FPC modules), FFS app, MLP app, Training app and FIMS
- Displays list of beneficiaries
- Thematic maps of the village
- Since the information is fetched through APIs, the report is generated on real-time basis

Benefits

- Single document which gives complete village profile is available to stakeholders
- Transparency in project execution
- Accountability to the community
- Data is made available in the public domain to all stakeholders



नानाजी देशमुख कृषि संजीवनी प्रकल्प — कृषी विभाग महाराष्ट्र शासन

अहवाल क्रमांक : गावेकृकप्र/गावाप्र/529995/2021/04 — दिनांक : 04/04/2021

ग्राम कृषी संजीवनी विकास दर्शिका

गावाचे नाव : अगर	गावाचा सर्वेक्षणांक : 529995	गावपंचायत: Agar
गावाचा (प्रकल्प) टप्पा : 2	गाव सहभाग मध्य बंद झा ?: हाय	गटसमूह कोड: 501_ptr-1_03
तालुका : अकोला	उपविभाग : अकोला	जिल्हा : अकोला

प्रकल्प कर्मचारी/अधिकारी

पदनाम	पूर्ण नाव	भ्रमणध्वनी क्रमांक
कृषीताई	Kukade Kavita Kishor	
कृषीमित्र		
समूह सहाय्यक	Parale Arti Pralhad	
कृषी सहाय्यक	Take Renuka Wamnarao	
मंडळाध्यक्ष प्रशिक्षक	bhatkar bharat	
तालुका कृषी अधिकारी	Iwanate S F	
उपविभागीय कृषी अधिकारी	Khot Kantappa	

ग्राम कृषी संजीवनी समिती

पदनाम	पूर्ण नाव	भ्रमणध्वनी क्रमांक
सरपंच	WAVARE GOKULA GULABRAO	
उपसरपंच	TAYADE MOHAN GONDUJI	
ग्रामपंचायत सदस्य	KHOLE PRADIP RAMESH	
ग्रामपंचायत सदस्य	SHEKH HAJIRABI IMRAN	
प्रगतिशील मंडळी	FUKAT PRADIP HARIDAS	
प्रगतिशील मंडळी	PATOND GAJANAN ANADA	
महिला मंडळी	SHRINATHA KAMALA PRALHAD	
महिला मंडळी	INGOLE REKHA PRAKASH	
महिला मंडळी	KUKADE KAVITA KISHOR	

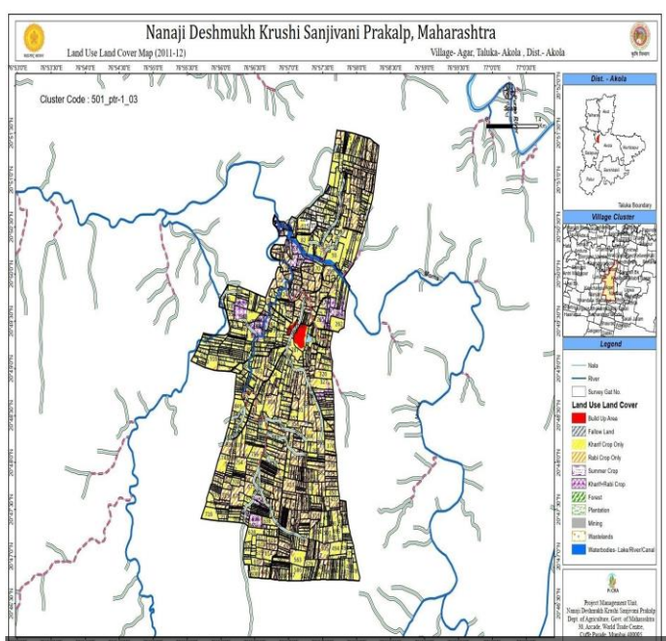
नोंदणी कलम मंडळी - 622	अंगीकृत एकूण संख्या - 214
पूर्णसंमती दिलेले अर्ज - 45	लाभ दिलेले अर्ज - 6
लाभार्थी संख्या - 5	लाभार्थी महिला मंडळी - 1
अनुसूचित जाती लाभार्थी - 1	अनुसूचित जमाती लाभार्थी - 0
वितरीत अनुदान रक्कम - 98,000	बँकमार्फत आधार संलग्न नसलेल मंडळी - 125

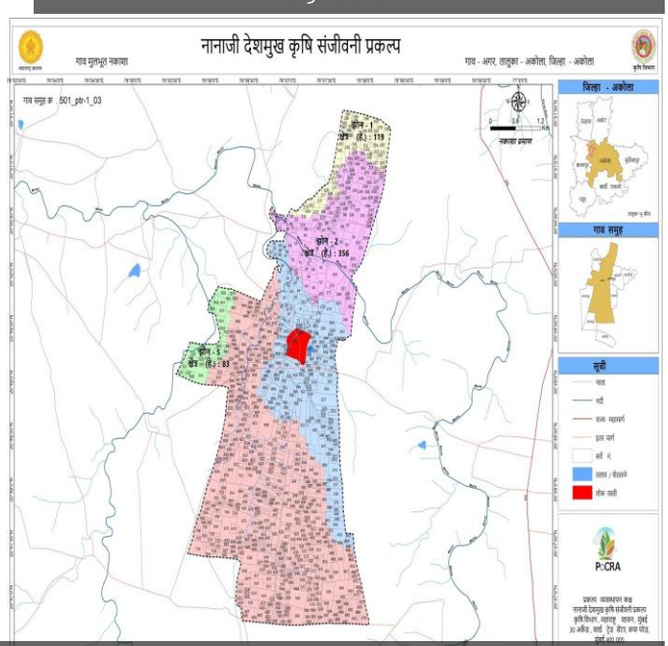
घटकनिहाय वितरित अनुदान

घटकाचे नाव	एकूण अर्ज	पूर्ण मंजूरी अर्ज	नाकारलेल्या अर्जांची संख्या	लाभार्थी मंडळी	वितरीत करलेला निधी (रु)
Planting material in polytunnels / Polyhouse / Shadenet house	1	0	0	0	0
Horticulture Plantation / Agroforestry	6	1	5	0	0
Saline & Sodic lands (Farm ponds/ Sprinklers / Water pump/ FFS)	8	3	5	1	16800
Farm Mechanization	68	0	19	0	0
Polyhouse/ Poly tunnels	3	0	1	0	0
Backyard Poultry	10	2	7	0	0
Apiculture	4	0	2	0	0
Well	4	0	4	0	0
Shadenet House	11	7	3	0	0
Drip Irrigation	17	2	4	0	0
FFS host farmer assistance / Promotion of BBF technology etc.	4	2	0	0	0
Water Pumps	5	4	1	2	30000
Inland Fisheries	1	0	0	0	0
Farm Pond (Individual)	12	1	6	0	0
Small ruminants	13	0	12	0	0
Sprinkler Irrigation	18	4	9	3	51400
Pipes	5	0	3	0	0

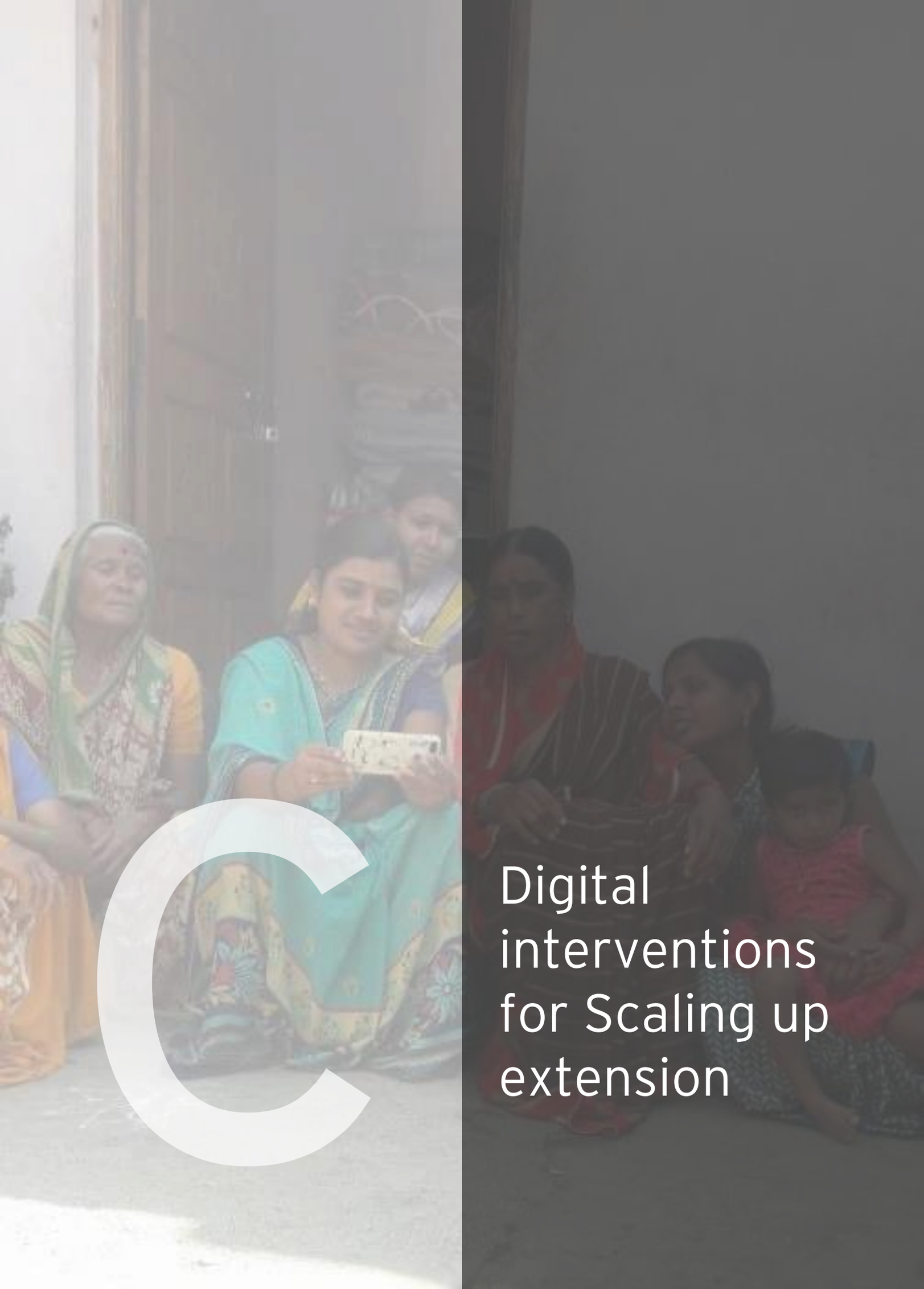
An illustrative village profile

Village profile gives an overview of PoCRA activities in the village at a click. This functionality was inaugurated online by Shri Dadaji Bhuse, Hon'ble Minister of Agriculture





The Village profile also contains useful maps like Land use pattern and hydrological zones.

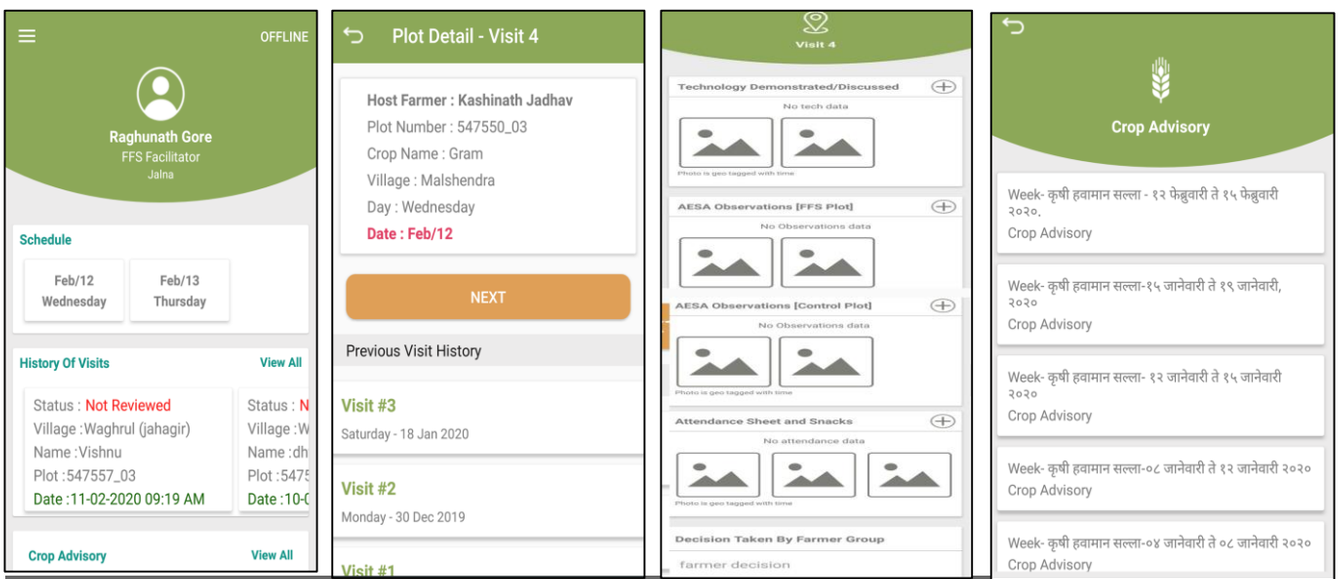


C

Digital interventions for Scaling up extension

FFS App helps in dissemination of climate-resilient technologies at scale

Overview	Features	Benefits
Acts as a vehicle for demonstration and adoption of climate resilient agriculture technologies in the village.	▸ Real time documentation of field observations and photographs through a smartphone application ▸ Geo-referencing of FFS plots ▸ Monitoring adoption of climate resilient technologies	▸ Effective monitoring of FFS sessions ▸ Provides information regarding crop condition, farmers' decisions, yield, and cost of cultivation ▸ Creates repository of crop related data to be used for generation of advisories through AI/ML



Screenshots of the application

Farmer Field School (FFS) imparts information related to climate-resilient agriculture technologies to the farmers by conducting their training at the farm. The FFS app helps plan the schedule of these sessions and allows the facilitator to captures key information including date of sowing, soil nutrient status, crop health, crop images, and pests incidence. These details and the weather data help the experts in generating advisories.

Capacity building management app facilitates coordination & reporting of events

Overview

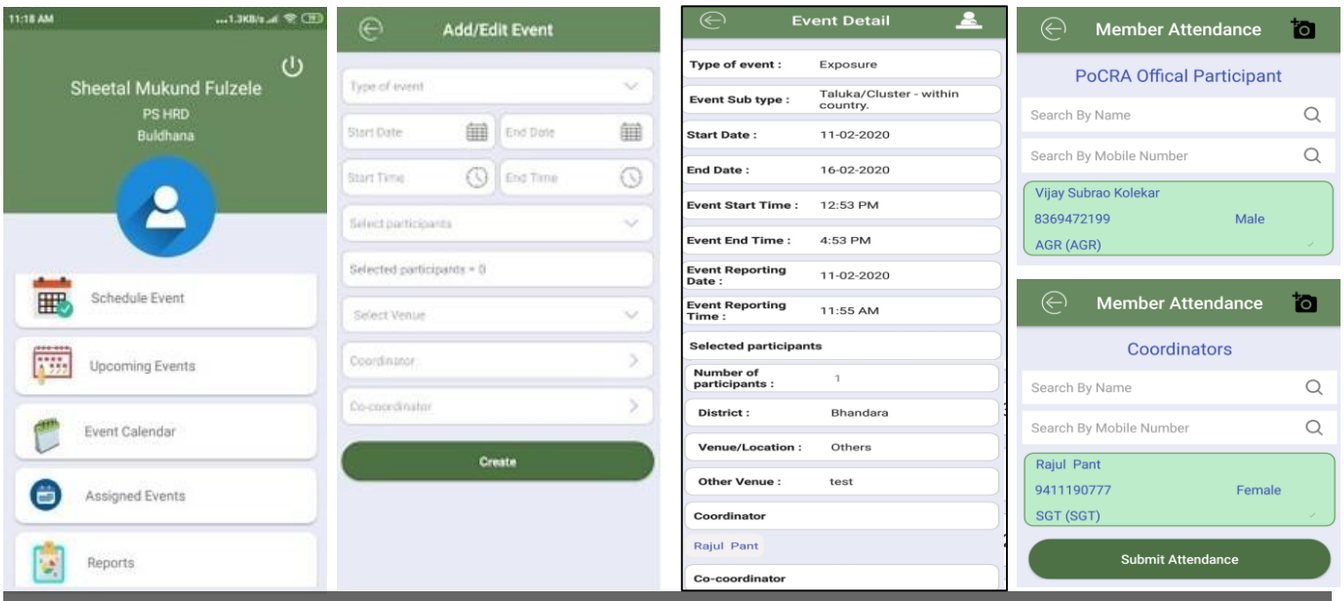
Application to plan, conduct and monitor all types of capacity building (CB) initiatives including training, workshops, exposure visits, and meetings

Features

- Scheduling CB events
- Monitoring participation of stakeholders
- Communication to trainees and trainers
- Captures photographs, geo locations and attendance
- Consolidated report of the event

Benefits

- Single application to track all CB events
- Useful insights for training organizers
- Reduces communication gaps between organizers and trainees
- Promotes efficiency in CB efforts
- Real time reports
- Creates repository of trainers, training topics, and trainees



Screenshots of the application

Capacity building of farmers as well as project functionaries plays a vital role in generating awareness and enhancing skills about climate-resilient agricultural techniques. The capacity building app is used to schedule such events and communication to the participants is through SMS.

Know your FPC tool assists in assessment of strengths and opportunities of FPCs

Overview	Features	Benefits
Analysis of the Farmer Producer Companies (FPCs) on the parameters like reach and inclusion, governance and management, financial strength, current business activities and infrastructure.	▸ Use of Google Form to collect information ▸ Multi parameter weighted score ▸ Customizable rating tool using Microsoft Excel	▸ Engaging with existing FPCs ▸ identifying the FPCs that need capacity building and handholding as well as those which are mature enough to take up a business activity ▸ Visually appealing output with self explanatory advisories for improvement

XXXX Farmer Producer Company Ltd.

Address – At. Post XXXX,

Tal. XXXX

Dist. XXXX

Score Report Summary

Criteria	Max. Score	Score Obtained
Establishment (Core Foundation Strength)	15	13.77
Governance (Control Systems in Place)	12	6.89
Management (Decision making processes)	10	3.44
Infrastructure (Assets and resources)	10	5.74
Finance (Financial base and health)	12	9.18
Business (Core business strength)	18	8.03
Capacity Building (Resource quality)	17	2.30
Climate Resilience (Adaptability to climate risk)	6	1.15
Final Score	**100.00**	**50.49** **50 (rounded off)**

What could improve your FPC?

Capacity Building

Training is required on crop production practices for adopting new technologies

Awareness on climate change is required so that the FPC can adapt Climate Resilient

Climate Resilience

The FPC should promote climate resilient varieties and more than one crop in a year will reduce the risk of crop failure

Strengthening the FPCs is one of the important objective of the project. The FPC rating tool highlights the current status of its strengths and opportunities. Project then provides need-based support to the FPCs.

Digital literacy initiative helps women stakeholders to access digital services

Overview	Features	Benefits
Project encourages women stakeholders to use digital technologies, thereby empowering them and strengthening their role as change agents in the rural economy	▸ Training to use internet, social media, UPI based transactions and use of PoCRA project applications ▸ Certification at the end of successful completion of training	▸ Increased participation of women in project activities ▸ Easy access to other Govt initiatives for education, health, and rural development sectors

Female farmers participating in a webinar while working in their field

Three generations of stakeholders participating in an online training

PoCRA emphasizes on the involvement of women in the project activities and has taken initiatives like Krishi Tai (female mobiliser) training & digital literacy to train women in the project region. Above images display the participation of female farmers using their handheld devices in the training sessions and women attending PMGDISHA class in Citizen Service Centre

Integration of third party APIs help in providing advisory services for farmers

Overview

PoCRA is continuously trying to give farmers useful advisories to help them take suitable decisions related to production and `post-harvest operations. Integration of APIs from IMD, soil health data, and Maharashtra State Warehousing Corporation with the database of PoCRA helps to generate advisories for farmers.

Features

The advisories contain weather data, weather forecast and crop related agronomic advisories at block level.
Real-time status of availability of storage and market prices.
These advisories are accessible through SMS, WhatsApp notifications, PoCRA website & app as well as social media.

Benefits

- Timely action by farmers based on advisories
- Advisory services for soil health and nutrition management
- Better price realization through informed choices
- Feedback to improve quality of advisories

API Integration

- Real-time collection of data from multiple applications

Advisory

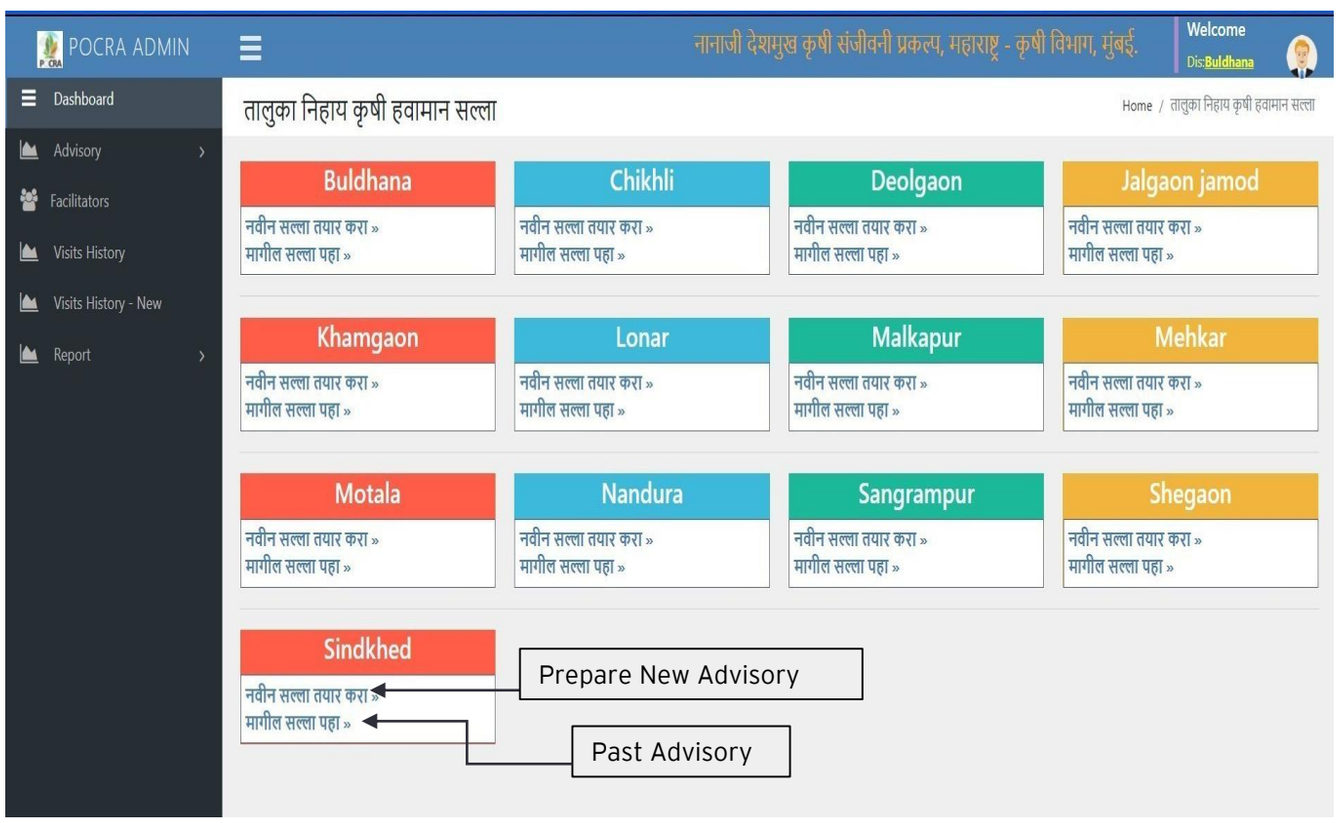
- Generation of block level advisories by KVKs using the data collected
- Advisories generated in local language

Dissemination

- Multiple dissemination channels used to reach wider cross section of stakeholders

Feedback & Optimization

- Effective feedback loop to collect the information on quality and usefulness of advisories
- Feedback is used for optimization of advisories

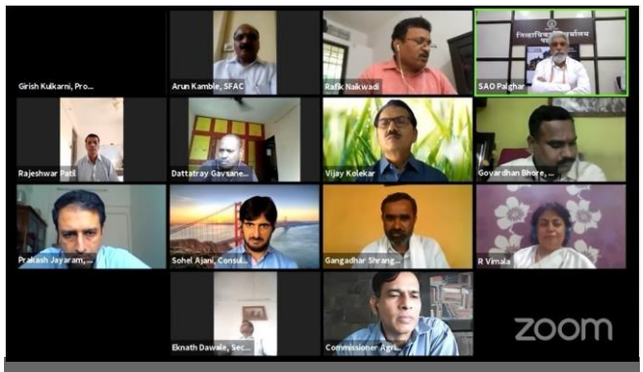


Dashboard displaying weather advisory interface used by KVKs to prepare new advisories for respective talukas.

Digital interventions helped in engaging stakeholders during COVID

Farmer engagement

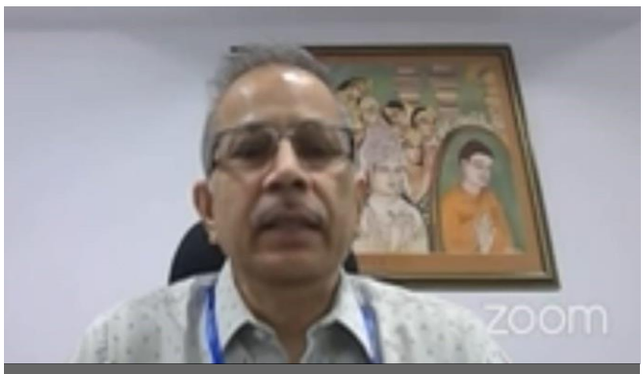
During the pandemic, the project officials were unable to interact with the farmers on a one to one basis due to COVID related restrictions. Considering the constraints, the project used alternative approaches including virtual engagements which got encouraging response from the farmers and the project officials. Innovative use of platforms like **Microsoft Teams, YouTube, and Zoom** proved to be the very effective mode of engagement with all the project stakeholders. During the pandemic, more than **2,50,000 farmers and project officials** participated in the webinars and training programmes which were aimed to disseminate important messages about project benefits and climate-resilient technologies.



Honourable Minister for Agriculture addressing farmers in a webinar during COVID.

Engaging the Institutions

Apart from the individual farmers, the project engaged with VCRMCs and farmers' collectives. The members of more than **3800 VCRMCs** including **Krishi Tais**, **1000 FPCs** and approximately **10000 SHGs** were engaged via virtual platforms during the year. Village assemblies (Gram Sabha) were conducted online which helped in quick decision of applications made by farmers.



Project Director addressing an online training program.

Most assets verified

The project officials toured extensively to provide assistance and support to the farmers **during the pandemic**. The verification of the farmers' sites prior to and post completion of the work was continued to ensure speedy approvals and disbursements to farmers. The project officials verified more than **1,30,000 assets** during the year following COVID appropriate behaviour during such visits.

Villagers participating in online training programmes using their cell phones.

Maximum disbursement of project benefits

The pandemic year proved to be the year wherein maximum number of farmers received monetary benefits since the inception of the project with the help of robust IT systems. In spite of the financial strain on state exchequer, the state government released more funds than the original outlay. The project disbursed **INR 664.77 Cr** during FY 20-21 which is **262%** higher than the disbursal in the previous year. The project disbursed **INR 553.38 Cr** directly into the bank accounts of **1,03,790** farmers.

Farmers' efforts to attain water and economic security

While bracing against the challenges posed by the pandemic, the farming community adopted technological interventions available under the project. A majority of farmers sought project support for interventions for securing access to water. Farmers having access to water opted for plantation of horticulture crops to enhance their income. The project helped the farmers to explore new avenues of income generation like sericulture and pisciculture.

Women participating in a training program

2

Impact delivered through use of Digital Technologies

The stories from the field are very interesting...

Angad Vishwambhar Kakde, from village Nipani jawalka, Taluka Georai, District Beed, owns 4.47 acres of land. He is PG in Arts and pursuing PhD. In modern history.

I applied for shade-net, planting materials, farm-pond & inland fisheries under PoCRA. I have received the financial approval after completing the work.

I was pleasantly surprised to receive the subsidy in my bank account within 7 days of the final visit of officials.

Smt. Shivshelabai Bhagwat Lokhande is a female farmer who owns 1 Ha of land in Jalgaon (Majra) village of Georai Taluka, Beed

I applied for guava plantation on my land.

The process of application was hassle free, easy and at no cost. I did not have to submit any physical documents.

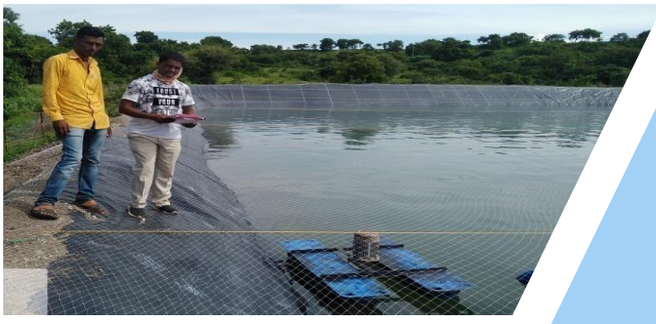
My application was processes and I received subsidy within a month in my bank account.

Smt. Pratibha Gedam is a landless women farmer in district Wardha

I don't own any land. I wanted to rear goats for livelihood. However, I was worried about the application process and the documentation to be submitted. However, the process of application was very smooth and did not require much documentation.

I purchased 11 sheep and received the financial assistance from PoCRA a year ago. My income has improved and I could also save some money for my daughter's wedding. I have also started a small kiosk to add my income. Thanks to PoCRA.

...highlighting the impact on rural households



Ali Hafis Bavjir, community farm pond & inland fisheries beneficiary from Digras village of Sillod Taluka, Aurangabad.

I was advised by PoCRA officials to apply for inland fishery activity in the community farm pond. I got pre-sanction for the activity and after implementation, I received subsidy directly in my bank account.

I got double benefit from the farm-pond and now I am getting additional income by selling the fish.

I am thankful to PoCRA and their their field officials for guiding me to apply on the DBT portal and prompt release of funds.

shade-net of Bhaskar Eknath Kafre in Tupewadi, Taluka Badnapur, District Jalna

My family invested more than 25 lakh rupees in erecting Shade net and in constructing a farm pond. We had faith in PoCRA officials and their speedy approval systems. We have been able to achieve our dream in a very short span of time - said the son of Bhaskar Eknath Kafare.

Ajintha Verul Farmer Producer Company" of Chikangaon village of Jalna district was formed in 2007.

This FPC established a Custom Hiring Centre by investing INR 20 lakh. They received 60% of the investment as subsidy within 4 months.

...and help make project delivery and monitoring easier

Mr. D.S. Gawsane,
DSAO, Latur

"PoCRA Apps are like an office on your cell phone." These applications make monitoring of works and performance of filed staff very easy. We are able to process applications while on the go.

P K Deshmukh is the SDAO of Vaijapur in Aurangabad district.

PoCRA applications have increased ease of working using my mobile phone or laptop even while I am travelling.

Applications run well and if there are any issues, the same are rectified by the development team quickly.

My Performance as well as my office staff has improved due to the ease of documentation through apps.

Snehal Shinde is the Taluka Agriculture Officer in Shegaon

PoCRA apps stand out because they are simple and user friendly. There are hardly any glitches and the data is available chronologically. All project data is readily available and helps in reviewing the works and resolve issues of farmers expeditiously. I am also thankful to the IT team of PoCRA who are quick to resolve any issue regarding the IT applications.

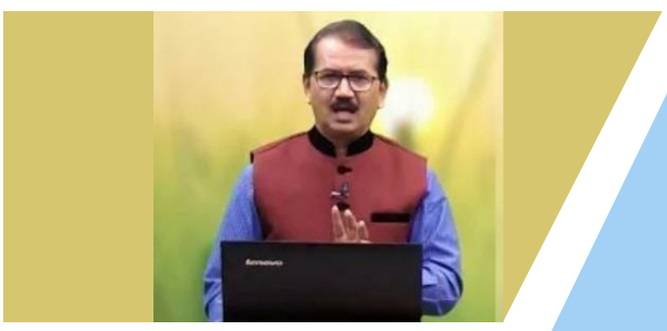
...through the assistance of IT interventions provided to the field staff

Ms. Manisha Tagad,
Agriculture Assistant,
Gangapur, Aurangabad

Initially I was sceptical about the use of IT applications for various processes under PoCRA. After seeing the ease with which farmers are able to use various applications, I now realise that my efficiency has increased. I am able to process the project proposals speedily and disburse funds to the farmers quickly. This has helped to create an atmosphere of trust in the farmers giving me great work satisfaction.

Mr. Amit Sawle, Cluster
Assistant, Loha, Nanded

The DBT app captures photos with geo tagged data. This helps officials at various levels to verify the works executed making the system very transparent. I could help a large number of farmers to avail benefits for a variety of works including Drip, Sprinklers, Farm ponds, Horticulture in a very short span of time due to the DBT app.



Mr. Vijay Kolekar
Agronomist, PMU PoCRA

Enabling farmers and village institutions to build climate resilience needs, besides resilient technologies, a strong human interface which is possible only through motivated and trained human resource.

The digital initiatives are an integral part of PoCRA and have been instrumental in dissemination of knowledge from source to users and feedback from users to managers.

Agriculture extension is gaining momentum with the availability of real-time information about farmers' resources and crops. Appropriate use of technology is enabling farmers in making informed choices. Ultimately digitalization is helping build trust of citizens and particularly farmers in governance.

Figures speak for themselves...

Farm Level Investment Activity	Number of farmers supported
Sprinkler irrigation	62,805
Drip irrigation	48,653
Water pumps	29,354
Water carrying pipes	25,379
Horticulture plantation	12,460
Seed production	11,627
Saline & sodic land interventions	5,530
Small ruminants	5,122
FFS host farmer assistance	3,853
Individual & community farm pond	3,785
Farm pond lining	1,659
Shade-net house	1,490
Inland fisheries	600
Sericulture	448
Creation of Wells	101
Poly-House	38
Total farmers supported	**212,904**

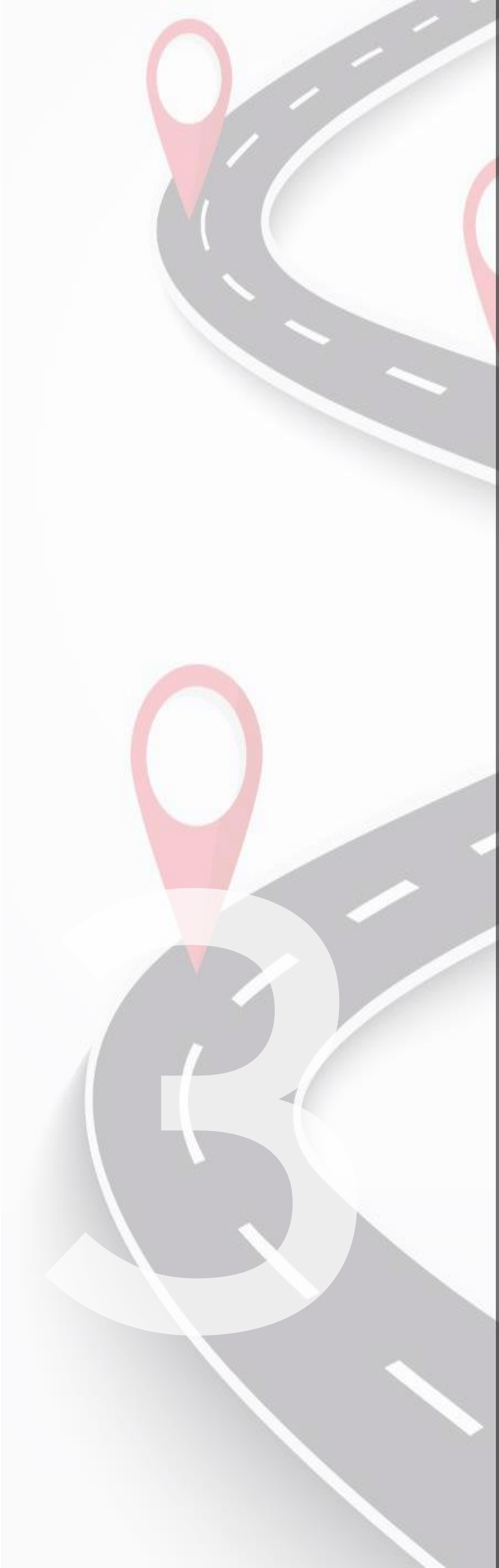
Particulars	Numbers
Farmer producer organizations supported	336
Number of farmers who are members of the supported FPOs	26,954
Community works undertaken	595
Number of farmers participated in farmer field schools	229,193
Number of participants in capacity building events	325,099

Total Project expenditure as of 1st June 2021:

INR 11.45 billion

Digital tools helped streamline PoCRA interventions & achieve project goals effectively

Indicator	PoCRA Interventions	Digital Tools
Increase in water productivity at farm level	Drip, sprinklers, farm pond, electric motor, pipes, demonstration & promotion of climate resilient technologies	▸ Direct Benefit Transfer Portal ▸ MLP App ▸ Farmer Field School App ▸ GIS Dashboard
Spatial and temporal yield variability for soybean and pigeon pea	Promotion of climate resilient seed varieties & technologies under FFS	▸ DBT Farmer portal ▸ FPC Portal ▸ NRM Portal ▸ Farmer Field School ▸ GIS Dashboard ▸ Training App
Number of project supported FPCs with growth of annual profits	Assistance of business plans of FPC & Farmer groups	▸ FPC rating tool ▸ FPC portal
Net greenhouse gas emissions	Activities taken for carbon sequestration such as horticulture plantation & Agroforestry	▸ DBT Farmer, FPC & NRM ▸ Farmer Field School ▸ EXACT- Tool ▸ Training App
Annual farm income comparator	Assets & services provided under project such as DBT, NRM, FPC, FFS, training, etc.	▸ DBT Farmer, FPC & NRM ▸ Farmer Field School ▸ Training App
Farmers reached with agricultural assets or services	Connecting farmers to access project benefits through digital applications (DBT, FFS, Training, etc.)	▸ DBT Farmer, FPC & NRM ▸ GIS Dashboard ▸ Farmer Field School ▸ Training App
Number of approved participatory mini watershed plans	Water balance computation, micro level planning, soil and water conservation works for natural resource management	▸ MLP app ▸ NRM portal ▸ Water budget model



3

The Road Ahead for Digital Technology at PoCRA

Key learnings from PoCRA's digital system

A shared belief and acceptance in a digital system makes its implementation easier

Start with simple digital tools, build slowly on successes, towards targeted solutions.

Avoid Big Bang.

User-centric design enables quicker acceptance even from semi literates

Adherence to project rules is key to better adoption of the digital system

(Avoid subjective changes in process and design)

Confidence shown by Comptroller and Auditor General (CAG) of India on the digital evidence and reports

A consistently used digital system helps to reduce trust deficit significantly

Farmers trust the government more when digital interventions deliver consistent outcomes

After initial hesitation, the confidence of field staff/officers increased in the digital system and sped up approvals

Digitally, larger audiences can be efficiently reached for training and capacity building

Use of local language enhances acceptance of IT systems

Data capture at the point of origin ensures data integrity and accountability

Enhancement in productivity leads to reduction in project management costs

Major challenges

Awareness
Lack of awareness about PoCRA interventions in remote villages

Poor connectivity in villages
Reaching out to stakeholders in villages where network connectivity is poor

Change Management
Convincing field officials to move to digital mode i.e. from paper to 100 percent paperless functioning

Business Process Re-engineering
Reluctance to change the current processes

Data harmonization
Harmonization of the data taken from multiple sources and formats

Digital Literacy
Lack of access to smartphones and inability to use the apps, portal and other digital initiatives

Some more work is required to achieve granular and comprehensive digital support

Significant digital progress has been achieved at PoCRA, starting with the vision of a comprehensive digital platform, with an integrated and federated architecture, using cloud-first, open-standard and open-source principles. Applications were developed using an agile, user-centric approach. To achieve the long term, sustainable goal, a few more steps need to be taken.

1 PoCRA portal

- Single source to access information and services offered by PoCRA
- Role-based, single sign-on access for various PoCRA digital applications

2 Learning Management System and extension services

- Integrate the capacity building efforts
- Increasing the reach and personalisation to provide context- and need-based solutions

3 Farmer Application

- Dedicated mobile application to empower the farmers with customized advisories and other services

4 Data Platform / Data Marketplace

- Make the data which is painstakingly collected from various sources available to different stakeholders through a single, API-enabled data marketplace, to enable sustained and rapid innovation
- Devise mechanisms to keep collected data updated

A farmer waits anxiously for rains so his crop survives the impending dry spell

4 Appendix: Project Background

Agriculture is the primary income-generating activity of majority of the population in the state of Maharashtra. However, recurring drought is a major challenge in drought-prone and rainfed areas of the state.

The project has identified 15 districts of the Marathwada and Vidarbha regions that have been most adversely affected by the recurrent monsoon failures of recent years. These districts account for a total population of 30.2 million people.

Out of a total of 18,000+ villages in the districts selected, the project covers 5,142 villages characterized by a high climate-vulnerability index; this includes 932 villages located in the Purna river basin tract which have high levels of soil salinity and sodicity. The project spans an area of more than 3 million ha.

The vast majority of rural households in the project districts are small and marginal farmers whose livelihood primarily depends on rainfed agriculture.

Implementation of climate-resilient agricultural practices amongst farmers in these areas can reduce climate-induced income stress.

About PoCRA

Farm-pond with lining is PoCRA's most common intervention. It not only acts as a source of water for protective irrigation but is also used for fish production.

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. The project attempts to bring transformational changes in the agriculture sector by scaling up climate-smart technologies and practices at the farm and mini watershed level. The project aims to drought-proof those villages of *Maharashtra severely affe*cted by agriculture distress and salinity/sodicity affected villages by promoting climate resilient agriculture technologies, investments in creating new assets for increased access to water, diversified cropping system, protected cultivation, and value chain at farm and community level.

The project includes selected villages in the districts of Aurangabad, Nanded, Latur, Parbhani, Jalna, Beed, Hingoli, and Osmanabad in the Marathwada region, Akola, Amravati, Buldhana, Yavatmal, Washim, and Wardha in the Vidarbha region, and Jalgaon in the Khandesh region. Salinity affected villages in the Purna river basin have been specifically selected due to the unique challenges faced by the farmers therein.

Map of the state of Maharashtra with the selected 15 districts of PoCRA (marked in colours)

More information about the project is available at the website: https://mahapocra.gov.in

PoCRA – At a Glance

Challenges

- Distress in agriculture sector
- Uneven distribution of rainfall
- Limited access to water
- Sub-optimal management of natural resources
- Outdated agriculture practices
- Agri extension services not reaching most vulnerable farmers

Objectives

To enhance climate-resilience and profitability of smallholder farming systems in selected districts of Maharashtra

Beneficiaries

- Small holder farmers
- Farmer Producer Organisations (FPOs)/ Farmer Producer Companies (FPCs)
- Women Self Help Groups (SHGs)
- Village communities

Financial outlay of the Project

- IBRD – 420 million USD (70%)
- Govt. of Maharashtra – 180 million USD (30%)
- Total – 600 million USD

Implementing agency

Department of Agriculture, Government of Maharashtra

Project duration

May 2018 to June 2024

The project has 4 components, with comprehensive Digital support...

Component	Activities	Rationale	IT Tools used
1 Promoting Climate-resilient Agricultural Systems	Planning for development of mini watersheds, farm level investments, and technology transfer	Access to water through efficient management of natural resources, improved soil health and better yield through adoption of climate resilient technologies & carbon sequestration, enhanced resilience through diversification	▸ MLP application ▸ Farmer DBT module ▸ NRM DBT module ▸ Farmer Field School ▸ Geo-spatial dashboard
2 Post Harvest Management and Value Chain Promotion	Post harvest processing of agriculture commodities, agriculture mechanization through custom hiring centres, and strengthening seed supply chain	Focus on FPOs as major drivers of change in the agri-food system. Promotion of climate resilient technologies in post-harvest management	▸ FPC Direct Benefit Transfer module
3 Institutional Development, Knowledge and Policies	Action research and analytical studies, capacity building	Focus on bridging the knowledge gap through strategic partnerships, capacity building of stakeholders to ensure sustainability of investments carried out under the project.	▸ Capacity building and Training app
4 Project Management	Institutional mechanism, project coordination	To achieve the desired outcomes as per the result framework, a strong and robust implementation mechanism has been set up.	▸ Financial Management System ▸ Field Activities Supervision and Tracking System (FAST) ▸ Single Sign On (SSO) System

Interventions are all inclusive

	Stakeholder	Support	Target
1	Farmer	Engaging farmers to provide them relevant agricultural advisory services, need-based training & financial assistance for farm level investments.	To assist and support approximately 1.8 million farmers with agricultural assets or services
2	Village level community	Support Village Climate Resilient Management Committee (VCRMC) in planning, implementation and supervision of project activities at village level.	To set up VCRMC in 3,884 Gram Panchayats covering 5142 villages and preparation of village micro plans.
3	FPC/FPO/SHG	Support Farmer Producer Organizations and Companies & Self Help Groups to implement their business proposals to integrate with agriculture value chains.	To engage with more than 10,000 registered FPCs/FPOs/SHGs.

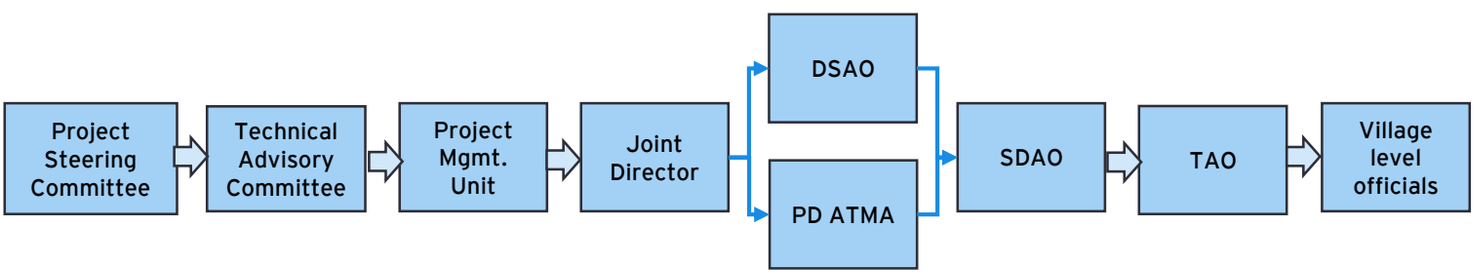
Since most of the farming operations are undertaken by women, the project has focussed on their capacity building through various interventions.

PoCRA has set up VCRMC for involvement of all project stakeholders in community led planning and monitoring of project activities. More than 50% of VCRMC members are women ensuring their active participation.

Project supports implementation functionaries using custom-built IT tools

	Functionaries	Support	IT Tools used
1	Field functionaries including – Cluster Assistants, Agriculture Assistants, Krishi Tais, and Facilitators	To support 8000+ field staff, project has developed applications which enable them to access information needed to complete their tasks. These apps empower users to capture project related details, take geo tagged photographs and take decisions.	▸ MLP app ▸ GIS dashboard ▸ DBT portal ▸ FFS app
2	Taluka Agriculture Officer (TAO)	The Taluka Agriculture officers use the DBT portal to scrutinize and approve applications/proposals of farmers for making farm level investments.	▸ Training app ▸ DBT portal
3	Sub-Divisional Agriculture Officer (SDAO)	Project has designed applications which enable the 36 SDAOs to monitor, track and provide approvals on the go. The MIS allows SDAOs to take focussed review of project activities in their jurisdiction.	▸ Training app ▸ FIMS app ▸ DBT portal ▸ FFS Dashboard ▸ MLP Dashboard
4	District Superintendent Agriculture officers (DSAO)	DSAOs are responsible for planning, monitoring and supervision of the project activities in project districts. The apps allow them to get a macro as well as micro level picture of the district.	▸ GIS dashboard ▸ Training app ▸ MIS
5	Project Director – Agriculture Technology Management Agency (PD – ATMA)	Apps and IT tools allow PDs ATMA to promote adoption of climate resilient technologies, provide support to FPC/FPO/SHG, and capacity building of stakeholders.	▸ FFS app ▸ Training app ▸ FPO DBT module
6	Project Management Units (PMU)	Apps help the PMU officials in monitoring of project activities. Apps provide support for better planning, focused interventions, and engagement with project stakeholders.	▸ MLP app ▸ GIS dashboard ▸ DBT portal ▸ Training app ▸ FIMS ▸ FAST

Organogram of PoCRA



Support provided to farmers includes...

Water related interventions

- Storage infrastructure – Farm ponds, farm pond lining, dug well, well recharge
- Water use efficiency through Micro irrigation (Sprinkler & Drip)
- Water conveyance through water pumps & pipes

Soil health and carbon sequestration

- Agroforestry
- Horticulture
- Organic input production

Saline soil management

- Farm pond
- Sprinkler
- Organic inputs

Protected cultivation

- Shade net house
- Poly house
- Poly tunnels
- Planting material

Integrated farming systems

- Small ruminants
- Backyard poultry
- Sericulture
- Apiculture
- Inland fisheries

Seed production of climate resilient varieties

Shade-net acts as protection against extreme weather conditions and ensures better quality of farm produce

Support provided to the FPOs / FPCs and SHGs includes...

- Custom Hiring Centre for agriculture mechanisation
- Sorting, Grading & Packaging units
- Storage Infrastructure
- Production of neem based inputs
- Primary processing
  - Dal mill
  - Medicinal/ Aromatic plant processing
  - Turmeric processing
  - Processing of Non- Timber Forest products
  - Vegetable/ Fruit processing
  - Bamboo processing and value addition
  - Oil extraction
- Supply of Agri-inputs
- Market outlets

Custom hiring centres enable farmers to access the farm machinery on hire basis. A combine harvester, as shown above, reduces harvesting costs and crop losses. PoCRA supports Self Help Groups / Farmers Group to set up custom hiring centres to enhance efficiency in agriculture operations.

Support provided to the village communities for Soil and Water conservation includes...

Catchment treatment

- Continuous Contour Trenches
- Deep Continuous Contour Trenches
- Trench Cum Mount (TCM)

Construction of new water harvesting structures

- Farm Ponds on common lands
- Farm Ponds on private lands

Rejuvenation of existing water harvesting structures

- Desilting of old water storage structures

Drainage Line Treatment

- Loose boulder Structures
- Earthen Check Dams
- Cement Check Dams
- Gabian Structure
- Earthen Structures
- Recharge Shaft
- Recharge shaft with Trench
- Composite Gabian Structure

On-farm water security

- Compartment /graded bunds

PoCRA assists village communities to undertake natural resource management activities through which soil and water can be conserved. A cement check dam, as shown above, allows impounding of water and increases the groundwater table of nearby wells.

A practical and effective results framework is being used to monitor and assess the project

Results	Indicators
Increased crop yield, optimization of water resources	Increase in water productivity
▸ Enhanced knowledge about Climate Resilient Agricultural practices & technologies ▸ Increased farmer income	Farmers supported/ reached with agricultural assets or services
Increased participation of female farmers in project activities such as Farm Field Schools, Training, financial Assistance, etc.	Female Farmers adopting improved agricultural technology
Improved water-use efficiency at farm level	Area provided with new/ improved irrigation or drainage services (in ha)
Improved availability of surface water for agriculture	Increased surface water storage capacity from new farm and community ponds (in TCM)
Enhanced soil health at farm level	Area with Good Agricultural Practices (GAP) for improvement of saline and sodic soils (in Ha)
Strengthened and financially sustainable FPCs	Number of Project supported FPCs with growth in annual profits
Beneficiary Participation and Civic Engagement	Number of approved participatory mini watershed plans implemented

Central Government departments and national agencies enabled the digital interventions...

IMD

Indian Meteorological Department (IMD) is the premium institute of the country which provides Agri-metrology services to farmers and extension machinery. Weather forecast API provided by IMD is utilized in preparing advisories for farmers in PoCRA region.

NBSS-LUP

ICAR-National Bureau for Soil Survey and Land Use Planning (NBSS-LUP) provided high-resolution land resources inventory for 500 PoCRA villages. This data is helping in improved water balance computation, optimum and sustainable use of natural resources, and generation of advisories.

UIDAI

Unique Identification Authority of India (UIDAI) stores the unique identity of the residents of India and enables secure and consent-based authentication of beneficiaries' identities. The API provided by the authority helps PoCRA to authenticate beneficiary farmers and allow direct benefit transfer of the financial assistance to their Aadhaar-linked bank accounts.

NPCI

National Payments Corporation of India provides functionality of paperless payments via UPI and other methods to account holders. PoCRA is utilizing NPCI payment mechanism for Direct Benefit Transfer (DBT) into the bank account of farmers.

NIPHM

National Institute of Plant Health Management, Hyderabad is a national institute with the mandate of human Resource development in plant protection technology, plant quarantine and bio-security with special emphasis on crop-oriented Integrated Pest Management approaches. NIPHM has conducted customized training programs for extension functionaries of the project. The training inputs have helped these functionaries in demonstrating climate resilient agriculture technologies through farmer field schools and encouraging their adoption by farmers.

Departments & agencies of Government of Maharashtra provided active assistance (1)...

Revenue Department

Land Records Department of Maharashtra maintains land records of the state. It has provided an API to PoCRA to fetch details of lands owned by the farmers at the time of registration on DBT app.

GSDA

The Groundwater Survey & Development Agency conducts exploration, development and augmentation of groundwater resources in the State. This includes rendering technical guidance by locating suitable dug well sites, strengthening groundwater sources by water conservation measures, artificial recharge interventions, specific studies related to the periodic status of groundwater availability and protecting the existing groundwater resources through technical assistance under the Groundwater Act. GSDA has prepared groundwater recharge plans for the selected PoCRA villages.

Commissioner Agriculture

Commissioner Agriculture has taken initiative for issuing soil health cards to all the farmers. This data will be utilized to generate farm specific advisories. Guidelines on technical matters, issued by Commissionerate have helped PoCRA in planning and implementation of project activities.

Rural Development Department

Rural Development Department of Government of Maharashtra provided socio-economic caste census data to PoCRA based on which vulnerability analysis of the villages was done. The department has also helped in setting up VCRMCs, the village level institutions, which are playing a pivotal role in planning, implementation, and monitoring of the project activities.

Departments & agencies of Government of Maharashtra provided active assistance (2)...

State Agriculture Universities (SAU)

State Agriculture Universities viz. Vasantrao Naik Marathwada Krushi Vidyapeeth Parbhani, Dr. Panjabrao Deshmukh Krushi Vidyapeeth Akola and Mahatma Phule Krushi Vidyapeeth Rahuri are providing technological backstopping for Climate Resilient Technologies (CRT) and seeds to the project. Conscious efforts are being made to disseminate CRTs to the farming community for wider adoption. SAUs have also been partnered for computation of coefficients for crop water requirement with the help of Digital Lysimeter.

Krushi Vigyan Kendras – KVKs (Agriculture Science Centres) which are technically mentored by the SAUs are helping farmers and extension agents to enhance adoption of CRTs, development of Agro-met advisories and technological backstopping.

MRSAC

Maharashtra Remote Sensing Application Centre (MRSAC) is the custodian of geospatial data in the state. MRSAC is helping PoCRA with the geospatial solution through the use of remote sensing datasets and GIS.

MahaIT

Maharashtra Information Technology Corporation Ltd. (MITC) is a wholly owned corporation of the Government of Maharashtra. MahaIT has set up an Innovation Lab in PMU PoCRA to develop, operate and maintain digital initiatives of the project.

MSINS

Maharashtra State Innovation Society (MSINS) is a nodal government agency to boost innovation-driven entrepreneurial ecosystem in the state of Maharashtra which is established under the Department of Skill Development and Entrepreneurship. The society aims to foster innovative approaches and create conducive environment for innovative businesses to operate in Maharashtra. MSINS provided assistance to PoCRA by bringing Satsure and Earth Analytics on board. They provided smart farming practices and actionable insights to farmers in addition to expertise in satellites remote sensing, machine learning and big data analytics to provide solutions in the domains of agriculture, banking & financial services,

Expertise of knowledge partners helped in better understanding and adoption of new technologies

IIT B

Indian Institute of Technology Bombay is an institute of national repute. IIT-B is working with PoCRA to develop a framework for water budget computation and to develop a GIS platform for visualization of user-centric parameters. An IoT-based validation and monitoring system has been tried on a pilot basis for energy and water use. Based on these technologies, IIT B is providing advisories to the project for optimization of water and energy usage for agriculture.

EY

EY has been working with PoCRA as the Technology Project Management Unit since the inception of the project. Throughout the project development journey, EY has contributed by designing and architecting the cloud-based technology stack for all the PoCRA apps. EY helped PoCRA set up an Innovation Lab for the rapid and user-centric design of applications and has assisted in the design and support of DBT portal and other apps.

M/s Runtime Solutions

M/s Runtime Solutions Pvt Ltd established and operationalised the Digital Innovation Lab at PMU PoCRA in 2018. For more than 2 years, the Digital Innovation Lab developed various android based applications and portal to provide need based IT solutions to the project stakeholders. In January 2021, the Digital Innovation Lab was handed over to MahaIT Ltd for operation and further development.

Kotak Mahindra Bank

PMU signed an MoU with Kotak Mahindra Bank for development of Direct Benefit Transfer Portal and transfer of matching grants to project beneficiaries. The Kotak Mahindra Bank hired the services of M/s Geeta Infotech India Private Limited to develop and operationalize the PoCRA DBT portal.

The start-up ecosystem was also engaged to try new concepts and ideas

Satsure

SatSure is an innovative decision analytics start-up, leveraging advances in satellites remote sensing, machine learning and big data analytics to provide solutions in the domains of agriculture, banking & financial services, infrastructure and climate change mitigation. Using remote sensing, it provided inputs to PoCRA about the area under cultivation and crop mapping on a pilot basis.

Wadhwani AJ

Wadhwani Institute for Artificial Intelligence (Wadhwani AI) is an independent non-profit research institute and global hub developing and deploying AI solutions for large scale social impact across domains such as healthcare, agriculture, education etc. It has developed an Artificial Intelligence-powered pest advisory and surveillance system for farmers and agriculture extension workers that provides real-time, scientific and localized pest advisory, thus empowering them with the scientific knowledge of an agriculture expert via a simple smartphone app. Targeting the farmers from the cotton-growing belt in the PoCRA region, Wadhwani AI has provided its advisory services to enable them to take timely action.

Earth Analytics

Earth Analytics India Ltd. is an affiliate of the Swiss tech company Sarmap, one of the world's leading experts in processing and analysing radar-based remote sensing data. It uses various sensors on satellites, drones and airborne systems to analyse agriculture growth parameters. Earth Analytics provided support to PoCRA by analysing SAAR data to monitor Kharif season crop in the districts of Parbhani and Buldhana.

Bharat Agri

BharatAgri provides smart farming practices and actionable insights to farmers based on changing conditions. Their algorithm analyses more than 30 variables that affect the growth of the crop to provide personalised services. BharatAgri is supporting PoCRA by tracking Farmer Field Schools for turmeric cultivation in the district of Hingoli.

The team behind digital initiatives

Vijay Kolekar

- Agronomist
- PMU PoCRA

Poonam Kane

- Assistant
- PMU PoCRA

Dnyandeo Wakure

- Former Soil Scientist
- PMU PoCRA

Kavita Tagade

- Technical Officer, NRM
- PMU PoCRA

Rafik Naikwadi

- Former Agribusiness Specialist
- PMU PoCRA

Urvashi Thakar

- Project Manager, IT
- PMU PoCRA

Dr. Meghana Kelkar

- Agribusiness Specialist
- PMU PoCRA

Deepak Patil

- Senior Technical Developer
- PMU PoCRA

Tulshidas Solanke

- Finance Specialist
- PMU PoCRA

Ashutosh Pandey

- IT Developer, DBT
- PMU PoCRA

Niteenkumar Bankar

- GIS Expert
- PMU PoCRA

Prakash Jayaram

- Partner, IT Consulting
- Ernst & Young

Dr. Rajul Pant

- Sociologist
- PMU PoCRA

Mahesh Wakode

- Director, IT Consulting
- Ernst & Young

Sachin Kadam

- M & E Specialist
- PMU PoCRA

Sohel Ajani

- Managing Consultant, IT Consulting
- Ernst & Young

PoCRA's digital footprint on the internet

Sr. No.	Logo	Description	URL	QR Code
1		PoCRA Website	MahaPoCRA.Gov.In	
2		PoCRA YouTube Channel	YouTube.com/c/ PoCRAMaharashtra	
3		PoCRA Facebook Profile	Facebook.com/PoCRA Maharashtra/	
4		PoCRA Twitter Handle	Twitter.com/PoCRA_	
5		PoCRA LinkedIn Profile	Linkedin.com/company/ PoCRA-Maharashtra	
6		PoCRA Instagram Page	Instagram.com/PoCRA_	

This report is available for download on the link below:

https://mahapocra.gov.in/home/digitizing-agriculture-for-climate-resilience

Women farm holder Mrs. Sandhya Tukaram Jadhav from village Digar, Taluka Kannad, District Aurangabad, got financial assistance for cultivation under protected environment... A leap towards building climate resilience.

My Family
My Responsibility

Project Director

Nanaji Deshmukh Krishi Sanjivani Prakalp

Maharashtra Project on Climate Resilient Agriculture

Department of Agriculture
Government of Maharashtra

30B, Arcade, World Trade Centre,
Cuffe Parade, Mumbai,
Maharashtra 400005
project-director@mahapocra.gov.in
+91 22 2216 3351