CASE STUDY 2-2

IMPLEMENTING ADAPTATION MEASURES

Diversification of Livelihoods, Technology Adoption and Natural Resource Management of Small and Marginal Farmers in West Bengal, India

Participating farmers and NGO Staff. Photo by MRI

Lessons Learned and Policy Recommendations

- Vulnerable farmers and their communities need information that enables better decision making for climate change adaptation.
- Giving ownership to communities and beneficiaries, in addition to grooming successful leaders, not only enhanced capacity building and technology adoption, but also made communities more self-reliant.
- Commitment of local experts, such as those by NGOs, ensures appropriate choices of adaptation measures, while nationwide organizations play a role in upscaling good practices.

Outline

Background

West Bengal is a state in eastern India. 70% of its total population, mainly the rural population, are dependent on climate-sensitive sectors (agriculture including animal husbandry and horticulture, and forestry and fisheries) for their livelihoods.[1] In the West Bengal State Action Plan on Climate Change (2012), water resources and agriculture sectors are two of the sectors with major interests.

This case study focuses on the activities of two related projects shown in Table 2-2-1, both of which are initiated to enhance adaptive capacity and increase the resilience of small and marginal farmers in West Bengal responding to climate change. In the project sites, effects of climate change such as temperature rise, rainfall-pattern change, decreases in dew have been perceived by these vulnerable communities. Typical seasonal characteristics of weather are disappearing. Winter is becoming brief and mild, interspersed with frequent warm spells. Summer is becoming longer. Monsoon onset is often late. Variability of monsoon rains is on the rise with increasing incidences of partial breaks in one region and heavy rainfall in another, causing partial droughts. Post-monsoon weather is becoming too uncertain and variable.[2]

Table 2-2-1 Target projects of this study

Project title	Duration/ Location	Supporting/ Executing Agencies
Diversifying livelihood options through integrated production systems for climate change adaptation and food and livelihood security of small and marginal farmers in water-logged flood plains of West Bengal (CCA IFS)	2011-2013/ Maldah and Murshidabad districts	GIZ, MoEFCC/ DRCSC
Enhancing Adaptive Capacity and Increasing Resilience of Small and Marginal Farmers in Purulia and Bankura Districts of West Bengal (EACIR)	2015-2018/ Puruliya and Bankura district	Adaptation Fund/DRCSC, NABARD

GIZ: Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
MoEFCC: Ministry of Environment, Forest and Climate Change, Government of India
DRCSC: Development Research Communication & Services Centre, Non-governmental development organization established in 1982
NABARD: The National Bank for Agriculture and Rural Development

Note: The project title acronym "EACIR" is not official, and is intended to be used in this document only.

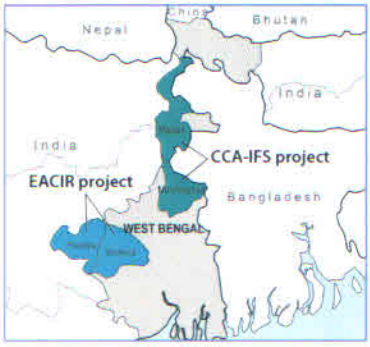


Figure 2-2-1 Locations of target district

Objectives

The projects aim to develop climate-adaptive and climate-resilient livelihood systems through diversification, technology adoption, and natural resource management for rural small and marginal farmers associated with agriculture and allied sectors in West Bengal. Specifically, they seek to enhance the adaptive capacities of vulnerable farm families in semi-arid regions of West Bengal by introducing measures to tide over the adverse impacts of climate change on their food and livelihood security.

The ongoing EACIR project focuses on 5,000 households covering about 22,596 beneficiaries, who belong to vulnerable small and marginal farming communities and communities dependent on natural resources as livelihood options.

Institutional arrangements

In the EACIR project, financial support from the Adaptation Fund (AF) is passed to DRCSC through the National Bank for Agriculture and Rural Development (NABARD), which is the only development bank in India, and one of the accredited entities of AF. As the executing entity of the project, DRCSC coordinates state-level and district-level authorities including volunteers, communities, and the Climate Resource Centre at a district level, to provide support to participating farmers. NABARD, on the other hand, is responsible for leading the initial conceptual and planning stage of the process, and coordinating relevant stakeholders throughout the project. The bank has the capability to expand good practices nationwide through local offices residing at state and district levels. The state government and the district authorities share ownership of the project through steering committees. **(See Figure 2-2-2)**

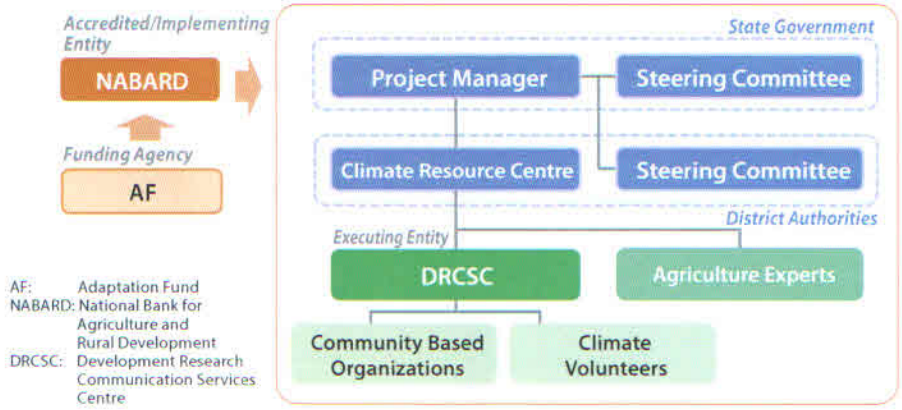


Figure 2-2-2 Institutional arrangements of the EACIR project [2]

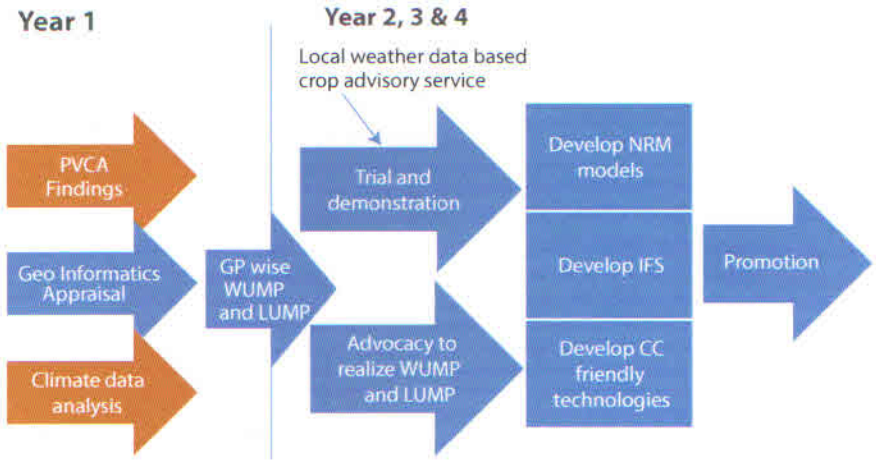
Activities

PCCA-IFS Project [3]

- Land shaping, that is, the redesigning of farmland to permit the use of portions of land during waterlogged periods. Farm ponds, canals and ditches are dug to drain off water. The soil thus excavated is used to elevate beds. Diverse varieties of vegetables and trees are grown on these beds, providing food and fodder throughout the year.
- Introduction of local fish species in the ponds for household consumption.
- Introduction of local varieties of water-resistant rice during the waterlogging period.
- Preponing the sowing of crops such as paddy and maize within the summer cropping season in preparation for the early monsoon.
- Postponing the sowing of crops such as wheat, mustard and coriander during the winter cropping season.

EACIR Project [2]

- Participatory Vulnerability and Capacity Assessment (PVCA).
- Preparation of the Land and Water Use Master Plan (LUMP & WUMP).
- Reducing climate risks through timely and appropriate early warnings in local languages.
- Climate-resilient technology transfers for enhancing the adaptive capacity of communities **(See Table 2-2-2)**.
- Learning and Knowledge Management.



PVCA: Participatory Vulnerability and Capacity Assessment
GP: Gram Panchayat (a village level administrative body)
IFS: Integrated Farming System
NRM: Natural Resources Management

Figure 2-2-3 EACIR Project Timeline [2]

Table 2-2-2
Technologies to be transferred to beneficiaries in the EACIR Project

1. Soil and water conservation	• Step pond • Plantation
2. Integrated farming	• Organic farming • Introduction of climate-resilient crops • Production of organic manure • Diversified/ relay/ row inter- cropping • Micro irrigation • Reforestation of wastelands
3. Disaster-proofing	• Seed/plant exchange • Low-cost water filter

Photos courtesy of DRCSC


Micro irrigation facilities; Pond neighboring to crop fields for water harvesting


Introduction of climate resilient crops; Short- duration paddy (Local variety)


Organic manure as part of an Integrated Farming System (IFS)


Soil and water conservation; Water Absorption Trenches (WAT)


Disaster Proofing Mechanism; Grain bank to save a portion of their produce


Automated weather station as a component of weather prediction and crop advisory message program

Figure 2-2-4 Examples of the Adaptation Measures Adopted in the Projects

Lessons Learned and Policy Recommendations

1 Vulnerable farmers and their communities need information that enables better decision making for climate change adaptation.

Accurate weather information is crucial for adaptation in the agriculture sector. To ensure the adequate density of weather stations, automated weather stations were supplemented with a manual weather data collection scheme run by volunteers.

Climate and agriculture experts have been involved in providing farmers with more accurate weather forecasts and agriculture advice. A well-designed system of information technologies and manual assistance from volunteers successfully sends weather information collected to experts and sends back weather prediction and advisory messages required to farmers. The system uses mobile phone networks and community information boards maintained by volunteers, and make the necessary information available to all farmers despite language barriers **(See Figure 2-2-5)**.

Photos courtesy of DRCSC


Manual weather measurement by a climate volunteer


Community board for weather forecast and agriculture advisory delivery

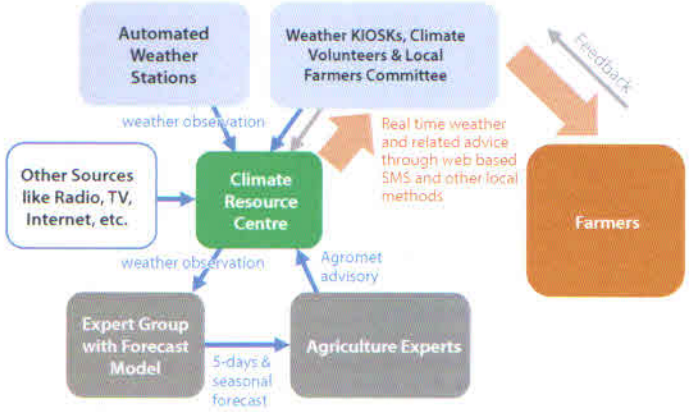


Figure 2-2-5 Collaboration Scheme for Data Collection and Advice Delivery [2]

Photos courtesy of DRCSC

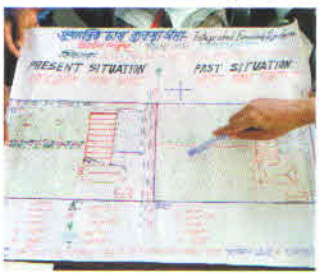
2 Giving ownership to communities and beneficiaries, in addition to grooming successful leaders, not only enhanced capacity building and technology adoption, but also made communities more self-reliant.

The beneficiaries directly supported by the projects represent a small portion of each community. In selecting such benefited households, communities were given ownership of the decision. This ownership transfer works effectively to involve the communities from the initial stage of the project, and tends to identify the most vulnerable farmers as candidates of direct beneficiaries. Capacity building of numerous communities has been conducted efficiently through sessions exclusively to groups of farmers.

Beneficiaries cover 25% of the cost of installing facilities such as composters, biogas facilities, and energy-efficient ovens. They usually collect the necessary fund from the farmers' mutual loan system, and return it within a few years. Having beneficiaries invest in the project better ensures the sustainability of the project.

Successful beneficiaries often become enthusiastic leaders. They voluntarily visit neighboring communities to share technologies. Integrated farming and organic farming not only diversify and stabilize the farmers' sources of income, but also reduce the farmers' dependency on markets since they do not have to spend as much on seeds and chemicals, and. Participating farmers report that their incomes increased significantly after they adopted the technologies. These successes of direct beneficiaries convince neighboring farmers to change their ways of farming and adopt new technologies of which they were suspicious at first.

Capacity-building session for a group



Documentation of activities by a practicing farmer with aid from NGO experts

3 Commitment of local experts, such as those in NGOs, ensures appropriate choices of adaptation measures, while nationwide organizations play a role in upscaling good practices.

Over decades, DRCSC, the executing agency of the project, has accumulated knowledge and experience on appropriate agricultural practices suited to the geographical and social characteristics of the target regions. It has also collected more than two-hundred varieties of local paddy, and is able to advise and provide an appropriate variety considering regional conditions. Knowledge and experience of local experts, such as those in NGOs, give a better chance of successful implementation of adaptation measures.

Involvement of nationwide organizations such as NABARD is effective for upscaling pilot projects. NABARD has offices in all states and districts. Its commitment from the initial stage of a project is important to find good practices in the country, and apply them to other regions with similar issues and characteristics.

CONTACT INFORMATION

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- National Bank for Agriculture and Rural Development (NABARD)

SOURCES

[1] Adaptation Fund website, "Enhancing Adaptive Capacity and Increasing Resilience of Small and Marginal Farmers in Purulia and Bankura Districts of West Bengal," https://www.adaptation-fund.org/project/enhancing-adaptive-capacity-and-increasing-resilience-of-small-and-marginal-farmers-in-purulia-and-bankura-districts-of-west-bengal/.

[2] Interview survey with DRCSC and NABARD conducted by Mitsubishi Research Institute, Inc. in August 2016.

[3] DRCSC website, "Climate Change Adaptation in Rural Areas of India, Livelihood Diversification through Integrated Production Systems," http://www.drcsc.org/GIZ/index.htm.

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