

Demonstration Projects



Climate Change Adaptation in Rural Areas of India - **CCA RAI**

The work related to demonstration projects, has been realised under the Indo-German development project Climate Change Adaptation in Rural Areas of India (CCA RAI) which is jointly implemented by the Ministry of Environment, Forests and Climate Change (MoEF&CC), Government of India and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. CCA RAI is financed by the German Federal Ministry for Economic Cooperation and Development. Over 5 years the project has tested several measures that contribute to building the resilience of communities and ecosystems to climatic and non-climatic stresses and reduces their vulnerability.



Ministry of Environment, Forests and Climate
Change, Government of India

Demonstration projects for climate change adaptation: methodology and lessons learnt

Context/Background

India is considered highly vulnerable to climate change, not only because of high physical exposure to climate-related disasters but also because of the dependency of its economy and majority of population on climate-sensitive sectors. In addition, poverty is a critical factor that limits the adaptive capacity of rural people in India.

In addition to the existing adaptation measures, there is a need to implement innovative measures with an objective to enhance local communities' coping capacity by providing alternate livelihood, increased income and better adapted land use systems.

MoEF & CC and GIZ are supporting the governments of the four partner states and local communities through Non-Government Organizations (NGOs) and other relevant stakeholders in identifying, developing and carrying out hands-on adaptation measures in land use. The partner states represent India's different agro-climatic zones: Madhya Pradesh, Rajasthan, Tamil Nadu and West Bengal.

In total, nine demonstration measures have been implemented under CCA RAI project in the four partner states. The target group of all projects is the poor rural population in India that is most at risk from climate change and whose survival depends strongly on the availability of natural resources (agriculture, fisheries, and forestry).

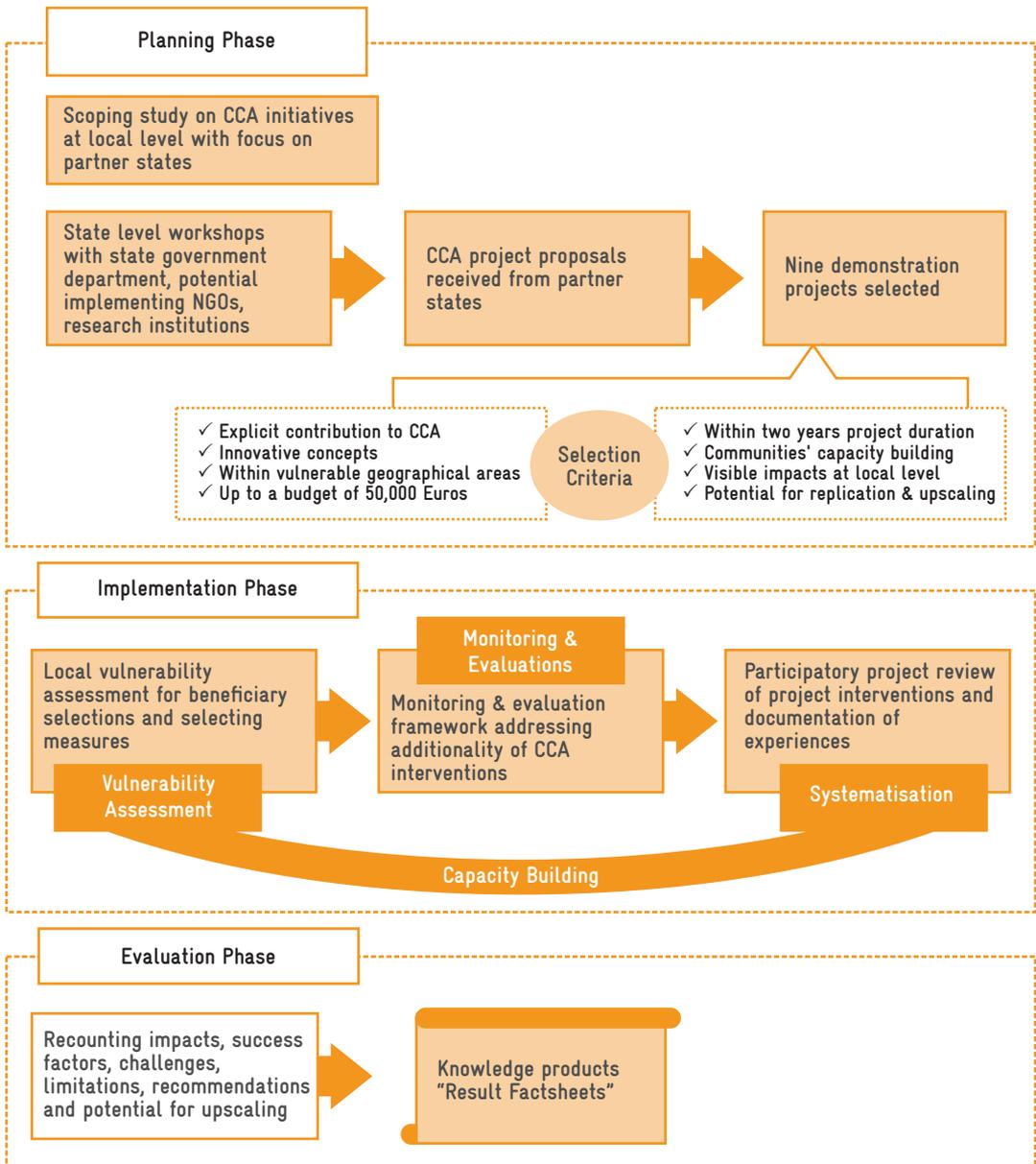
Approach and activities

Adaptation Hypothesis

Carrying out adaptation measures contributes to increasing the resilience of communities to deal with climate change. Testing, evaluating and demonstrating the results of these projects enrich the overall adaptation knowledge which leads to replication at a larger scale.



All the demonstration measures follow a certain approach as shown below-



Planning phase

Planning phase: A scoping study "Compilation of Projects and Measures with Climate Change Adaptation Potential in India" developed a database of ongoing community-based climate change adaptation initiatives in India. The study focused on the project's partner states. Further, state level workshops were conducted together with the state environment departments and with participants from other government departments, potential NGO partners (pre-selected together with government departments) and research institutes to discuss the climate change adaptation concepts and prepare concept notes. NGOs were invited to submit detailed proposals based on these concepts. In total, nine proposals were finalized based on the stringent selection criteria.

Implementation phase

Implementation phase: At the outset implementing NGOs carried out local vulnerability assessments (VAs). This step helped to determine the impacts of climate variability and change on communities in the project sites. Apart from increasing the overall knowledge on local climate change impacts and vulnerabilities, the assessments help in improving the design of adaptation interventions and select beneficiaries based on identified vulnerabilities.

The results of the local VAs have been used to develop Monitoring and Evaluation (M&E) frameworks for adaptation projects.

Based on the guidebook "Adaptation made to measure", the design and results-based monitoring of climate change adaptation projects have been designed. The five step approach applied in establishing M&E framework is given below-



Evaluation phase

A participatory process called 'systematisation' was followed to generate learnings from community based adaptation intervention. The approach was applied for the first time in the field of community based adaptation in India. It helps reflect project activities in light of their contribution to adaptation and identify if changes to the project's activities are necessary for meeting the overall project goal. Even more importantly, systematisation helps to create knowledge on successful adaptation options that are suitable for up-scaling.

Demonstration measures were evaluated post completion to summarise the social, environmental and economic benefits and associated costs arising from different adaptation interventions. Recommendations are available for upscaling of successful approaches.



Results

The CCA projects implemented in four states benefitted the most vulnerable sections of society. In terms of outreach, the adaptation measures reached out to:

- **Total beneficiary households: 6027**
 - o Direct beneficiary households: 2595
 - o Indirect beneficiary households: 3612 (e.g. through awareness campaigns)
- **Total beneficiary individuals: 20099**
 - o Direct beneficiary individuals: 9563
 - o Indirect beneficiary individuals: 10536 (e.g. through awareness campaigns)

At local level, socio economic conditions and environmental services have improved resulting in enhanced adaptive capacity of the local communities. The experience gained and the capacity built enabled some of the implementation partners to submit proposals to Adaptation Fund Board through the national implementing entity NABARD.

State wise Results

The livelihoods of indigenous communities in **Madhya Pradesh** depending heavily on small-scale rain-fed farming and on non-timber forest produce are highly impacted by erratic rainfall and deforestation. Other major reason for forest degradation and overuse of natural resources is weak village institutions. Strengthening of institutions conserved over 500 hectares of forest; implementation of soil water conservation methods conserved a total of approx. 37,000 cubic metres of soil which resulted in an annual average income increase of 40 per cent.

The State of **West Bengal** has rain-fed agriculture as primary source of income. In flood prone regions of West Bengal, diversifying livelihoods of agriculture dependent local community has proven to be a successful adaptation intervention. Establishing integrated production systems where with a wider range of crops complemented by improved livestock breeding, poultry, nutrition garden and fisheries incomes of beneficiaries have raised by 70-100 per cent.

In the region of the Ganga delta, where cyclone events and salt water intrusion are affecting the rural population, the introduction of salt-tolerant paddy varieties and fish cultivation harness livelihoods against climate change and has increased incomes by 23 per cent and 50 per cent respectively within one year. Large parts of the people living in coastal areas in **Tamil Nadu** are landless and dependent on fishery and paddy cultivation. People living at the coast are affected by storms; flood, cyclones and rising sea level have led to erosion and salinization of land and ground water. Establishing integrated mangrove and fish farming systems not only mitigates the effect of cyclones but creates additional income up to 81,000 Indian rupees per year per family. In rain-shadow region of Tamil Nadu, applying tank silt in the fields increased soil productivity and resulted in increased production of millet and cotton by 20 per cent. The



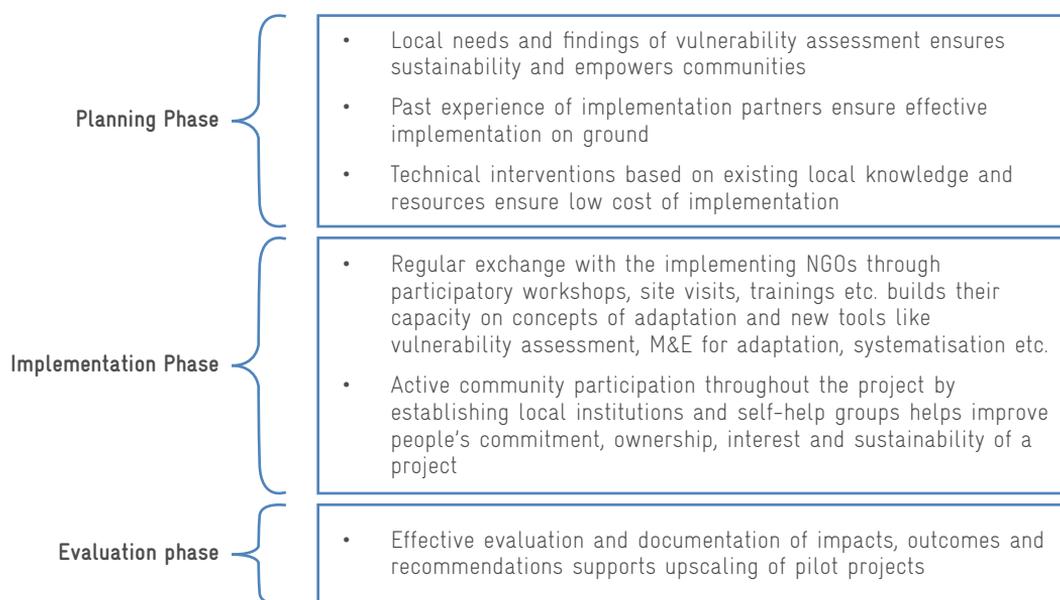
introduction of insurance products also played a major role in reducing risks from loss of assets. They provided beneficiaries with more confidence, resilience and options for action.

The Gulf of Mannar, located in the south-eastern tip of **Tamil Nadu** is one of the four major coral reef areas in India. The coral and associated fishery resources in the Gulf have been historically exploited and damaged through climatic stresses like increase in sea surface temperature and non-climatic stresses like coral mining, destructive fishing practices. Rehabilitating the degraded corals and raising awareness among the village communities on the benefits of conserving coastal habitats builds local communities' resilience. Training on supplementary livelihood activities like development of value added products resulted in increase in communities' income by 30%.

Livestock rearing is the main component of agriculture in semi-arid Rajasthan. The greater variability in precipitation combined with heavier rainfalls after longer periods of drought have increased soil erosion on degraded pasture lands thereby leading to reduction in grass and plants which are used as fodder. Integrated pasture management resulted in improved fodder availability by an average of around 70 per cent.

Movement of sand dunes in Thar desert causes substantial damage to infrastructure and agriculture every year. An innovative approach using multiple layers of indigenous vegetation in **Rajasthan** helps in stabilising sand dunes and improves the local economy by providing additional fodder, fuel wood, fruits and vegetables as well as different types of minor forest produce.

Recommendations & Learnings



Adaptation Measures, Implementation Partners, Beneficiaries and Key Results

State	Adaptation Project	Project Activity	Implementation Partner	No. of Beneficiaries (Individuals)	Key Results
Madhya Pradesh	Eco-restoration through institution strengthening, sustainable forest management and sustainable agriculture management	<ul style="list-style-type: none"> - Local level vulnerability assessment - Strengthening village institutions - Promoting agro-forestry - Construction of stone exits and stone bunds - Improved farming techniques 	Foundation for Ecological Security (FES)	7,743	<ul style="list-style-type: none"> - Strengthening of institutions conserved over 500 hectares of forest - Soil water conservation methods conserved a total of 37,319 cubic metres of soil, resulting in an annual average income increase of 40 per cent
	Climate-proofing fish farming	<ul style="list-style-type: none"> - Review of scheme guidelines 	Towards Action and Learning (TAAL)		<ul style="list-style-type: none"> - Modified guidelines addressing climate stresses impeding fisheries in district and state
Rajasthan	Improving pasture management and livestock Rearing	<ul style="list-style-type: none"> - Local level vulnerability assessment - Training Local Adaptation Agents and forming Livelihood Adaptation Groups - Integrated Group Pasture Management activities - Promoting agro-forestry 	Action for Food Production (AFPRO)	240	<ul style="list-style-type: none"> - Integrated pasture management resulted in enhanced fodder production, increasing 70% local incomes
	Using Vegetation to stabilise sand dunes	<ul style="list-style-type: none"> - Local level vulnerability assessment - Fencing and establishing micro-wind breaks or mulch lines - Planting seeds of creepers and trees - Training and capacity building 	Rajasthan Forest Department and the Rajasthan State Pollution Control Board (RPSB)	141	<ul style="list-style-type: none"> - Fodder availability ensured upto INR 6660 per hectare annually from third year onwards - Harvesting of Acacia Senegal for fuel wood is expected to be of INR 10,000 per hectare (6th year onwards)
West Bengal	Livelihood diversification through Integrated Production Systems	<ul style="list-style-type: none"> - Establishment of integrated production systems - Introduction of new crop varieties - Mixing of different crop varieties throughout the year - Changing the timing of farm operations - Introduction of new cultivation methods - Trainings and skill development 	Development Research Communication & Service Centre (DRSCS)	158	<ul style="list-style-type: none"> - Establishing integrated production systems raised beneficiaries' income by 70-100 per cent
	Introducing salt-tolerant species and preparing for disasters	<ul style="list-style-type: none"> - Local level vulnerability assessment - Awareness campaign and disaster training - Establishment of institutional arrangements - Formation of a Climate Change Information and Adaptation Centre - Collection of soil and water salinity data - Implementation of climate adaptive livelihood options 	West Bengal University of Animal and Fishery Sciences (WBUAFS) and World Wide Fund for Nature (WWF) India	884	<ul style="list-style-type: none"> - Salt tolerant paddy and fish increased incomes by 23 per cent and 50 per cent respectively within one year
Tamil Nadu	Integrated Mangrove Fishery Farming	<ul style="list-style-type: none"> - Local level vulnerability assessment - Establishment of a nursery (mangroves & halophytes) - Design and construction of 7 ponds with raised bunds - Selection and introduction of suitable species of fish, prawns and crabs - Creation of a village level institution - Technical trainings 	M S Swaminathan Research Foundation (MSSRF)	786	<ul style="list-style-type: none"> - Mitigates the effect of cyclones - IMFFS led to additional income up to 81,000 Indian rupees per year per family
	Tank silt application and rainwater harvesting	<ul style="list-style-type: none"> - Local level vulnerability assessment - Restoring community rights for tank silt application - Tank silt application on agricultural land - Construction of innovative small scale farm ponds - Introduction of horticulture and agro-forestry - Promotion of insurances 	Development of Humane Action (DHAN) Foundation	2,385	<ul style="list-style-type: none"> - Increased soil productivity - Increased production of millet and cotton by 20 per cent - Insurance products provided beneficiaries with more confidence, resilience and options for action
	Rehabilitation of Coastal habitats	<ul style="list-style-type: none"> - Local level vulnerability assessment - Awareness/capacity building - Underwater surveys - Construction of artificial substrates - Deployment of substrates in the selected sites - Collection and transport of coral fragment and sea grass shoot transplantation 	Suganthi Devadason Marine Research Institute (SDMRI)	520	<ul style="list-style-type: none"> - Training on supplementary livelihood activities like development of value added products resulted in increase in communities' income by 30%



Published by :

Climate Change Adaptation in Rural Areas of India (CCA RAI)
Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

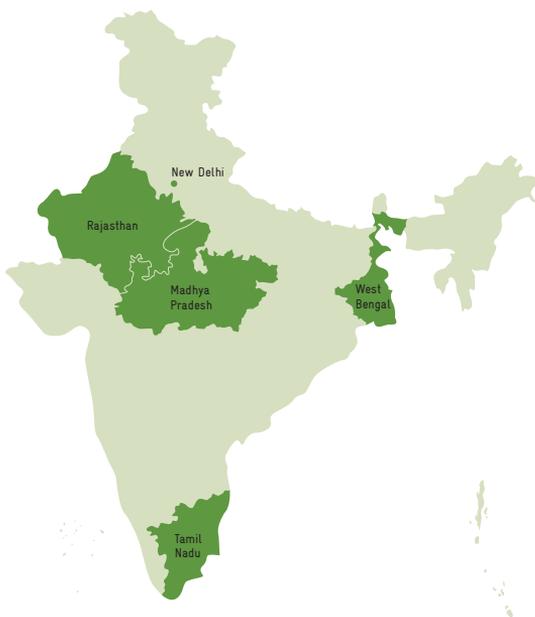
Responsible : Anna Kalisch

Edited and compiled by :

Deepika Duggal
Anna Kalisch
Somya Bhatt

Website :

www.ccarai.org



PROJECT PARTNERS

Government of India

Ministry of Environment, Forests and
Climate Change (MoEF & CC)
| <http://www.envfor.nic.in/>

German Development Cooperation

Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH
| <http://www.giz.de>

Government of Madhya Pradesh

Environmental Planning and Coordination Organization
(EPCO)
| <http://www.epco.in/>

Government of Rajasthan

Pollution Control Board
| <http://rpcb.nic.in/>

Government of Tamil Nadu

Department of Environment
| <http://www.environment.tn.nic.in/>

Government of West Bengal

Department of Environment
| <http://www.enviswb.gov.in/>