PARTNERS FOR RESILIENCE

NARRATIVE PROGRESS REPORT - India

List of Abbreviations

ASK	Association for Stimulating Knowhow
CBD	Convention on Biological Diversity
CCA	Climate Change Adaptation
CDA	Chilika Development Authority
CENDERET	Center for Development Research and Training
CIFRI	Central Inland Fisheries Research Institute
CMDRR	Community Managed Disaster Risk Reduction
CoP	Conference of Parties
DDMP	District Disaster Management plan
DoAg	Department of Agriculture
DoEF	Department of Forests and Environment
DoF	Environment and forest Department
DoIrr	Department of Irrigation
DoRD	Department of Rural Development
DoWR	Department of Water Resource
DRR	Disaster Risk Reduction
EMR	Ecosystem Management and Restoration
GIS	Geographical Information System
ICZMP	Integrated Coastal Zone Management Project
MoEF	Ministry of Environment and Forest
MoWR	Ministry of Water Resource
NDMA	National Disaster Management Authority
NetCoast	Network of Conservationist
NGO	Non Government Organization
NIDM	National Institute for Disaster management
OSCZMA	Orissa State Coastal Zone Management Authority
OSDMA	Orissa State Disaster Management Authority
PEDRR	Partnership for Environment and Disaster Risk Reduction
PfR	Partners for Resilience
PRA	Participatory Risk Assessment
RCCC	Red Cross/Red Crescent Climate Centre
SBSTTA	Subsidiary Body on Scientific, Technical and Technological Advice
SHG	Self Help Group
UNEP	United Nation Environment Programme
WISA	Wetlands International South Asia
XIM	Xavier Institute of Management

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1. Focal group discussion at Udayakani, Orissa
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Reporting Period	**01/02/2011 to 31/12/2011**
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2 Executive summary

2011 was the first full year of implementation of PfR-India programme. The focus during the period was on developing networks, clarifying roles and responsibilities, implementation mechanism and developing community risk reduction plans for increasing livelihood resilience in the two key project areas: Mahanadi Delta, Orissa and Gandak-Kosi floodplains in Bihar.

The project inception workshops were held in March and April 2011, wherein the programme logframe was finalized, indicators developed and mechanism for setting baselines identified. The partners identified 212 villages within 15 districts of Orissa and Bihar as target villages for implementation of livelihood security interventions. Following the inception workshop, the partners worked on establishing an internal baseline for project monitoring and evaluation. Using the logframe as a basis, data at household, Panchayat and village levels were collected and analysed. A Participatory Risk Assessment format was also finalized in consultation with partners. The tool used a broader approach to risk assessment – in particular focusing on the risk context as a means of understanding the geophysical, ecological and social context of (systemic and non-systemic) risk. Implementation support in the form of field as well as training on concepts was provided to the partners.

The focus of civil society capacity building was on the 21 partner organizations linked to PfR India programme. During the course of inception workshops, the PfR partners were introduced to the concepts of resilience and linkages of EMR, DRR and CCA. An exchange visit of NetCoast partners was organized to Bettiah, Purbi Champaran to gain an understanding of the risk assessment process. This was followed by a planning workshop on the DRR approaches, wherein the tool was piloted in 2 coastal villages. PRA was completed in 125 villages of Orissa and 51 (out of 87) villages of Bihar. Additionally, training was imparted to the local partners to prepare the cluster level risk reduction plans

Activities under institutional environment focused on engagement with the Orissa State Integrated Coastal Zone Management Authority (OSCZMA), National Disaster Management Authority (NDMA) and the Ministry of Environment and Forests (MoEF), Government of India. PfR (through Cordaid) engaged with the NDMA to develop integrated District Disaster Management Plans. The process involved extensive stakeholder consultation and has been initiated in Puri, Orissa and Bettiah, Bihar. Within MoEF, the PfR partnership (through WISA) worked on the Convention on Biological Diversity (CBD) agendas to ensure that the role of ecosystems in reducing disaster risk is appropriately recognized and highlighted. PfR also supported NIDM in delivery of a UNEP-PEDRR course on ecosystem based Disaster Risk Reduction.

3 Context

3.1 Changes in external environment

There have been several changes in external environment since the launch of the PfR-India programme in early 2011 which serve to increase the relevance of project implementation in India. Some of the key developments are:

Implementation of Integrated Coastal Zone Management Project (ICZMP)
Integrated Coastal Zone Management Project is an initiation of the Ministry of Environment and Forests, with support of World Bank aimed at conservation and sustainable use of coastal natural resources and securing livelihoods of coastal communities within the states of Gujarat, West Bengal and Orissa. *PfR team is developing cluster level risk reduction plans for Mahanadi delta in close association with ICZM team for implementation of the risk reduction plans in coastal districts of Orissa.*

India as the destination of 11th Conference of Parties meeting of the Convention of Biological Diversity
The Ministry of Environment and Forests (MoEF), Government of India will be hosting the 11th Conference of Parties (CoP) Meeting of the Convention of Biological Diversity (CBD) during October 2012 in Hyderabad. *PfR (through WISA) is working with the MoEF to highlight the ecosystem services values of biodiversity, including disaster mitigation, through a series of assessments and preparatory events. PfR will also be sponsoring a participant from the coastal districts of Orissa for the Go4BioDiv International Youth Forum 2012, a parallel event with CBD CoP11.*

Review of National Water Policy
The National Water Policy provides an overarching action framework for conservation and management of water resources. With the increasing intensity and frequency of water related disasters, ensuring sufficient emphasis on sustainable water management as means of disaster preparedness is an important policy target. *PfR, through WISA, is currently liaising with Ministry of Water Resources to ensure that the review process includes focus on these elements*

Floods in Mahanadi Delta
The Mahanadi delta region was witnessed two high flooding events in September 2011 inundating two-thirds of the State's districts and affecting approximately 2.2 million people. Relief and rehabilitation was coordinated by PfR partners in 5 coastal districts of Orissa supported through Cordaid. The floods also provided an opportunity for understanding the relevance of PfR programme in the delta region. (Box 1)

PfR Global Conference
PfR India team participated in the PfR global conference in Netherland during September 2011 for PfR concept development.

One of the key novelties of the PfR Programme is integration of DRR, EM and CCA approaches towards building resilience. However, it is widely acknowledged that three domains differ widely in terms of frameworks, approaches and intervention strategies and working on their own can at best approach resilience only partially. Acknowledging this gap, WISA and Cordaid through the financial support of International Development Research Centre (IDRC), New Delhi, India and CDKN (Climate and Development Knowledge Network), United Kingdom organized an Asia regional conference aimed to provide an interdisciplinary platform to researchers, practitioners, and policy makers working within the domains of environmental management, development and disaster risk reduction for developing a shared vision of livelihood resilience in changing climate. A brief report of the conference is presented as Box 2 (page 9). The conference outcomes were also presented in the PfR Global Work Conference held in the Netherlands during 18-23 September 2011.

Box 1: Floods in Mahanadi Delta – What lessons for PfR ?

Mahanadi delta was subjected to two consecutive high flood events in September 2011. The 9 September floods were attributed to heavy rains in the upper catchments during 24-28 August which led to steady increase of water level in Hirakud Dam to 628 feet, close to its maximum storage level of 630 feet. On September 7, the dam storage level was at 625.60 feet when 10 of its 64 sluice and 34 craste gates were open. Within a span of 48 hours, the river received five times more water, and nearly double to what the reservoir could hold, forcing opening of 55 sluice and 4 craste gates. As 13.66 lakh cusec water flowed from Mahanadi through Mundali near Cuttack, a large number of breaches were created in the River system putting the densely populated delta to risks. The flooding event of 22 September was attributed to heavy rainfall in the delta itself. Two thirds of the state's 30 districts were inundated affecting nearly 2.2 million people.

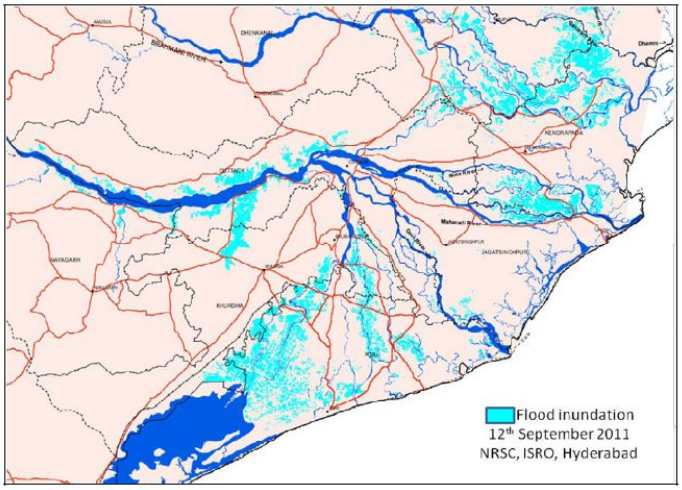
The emphasis of flood control within Mahanadi Delta has been largely structural. The focus now is on revisiting the adequacy of the Hirakud Reservoir Rule curve – a relationship between water storage and releases in a reservoir which determines allocation for water uses for various purposes as irrigation and hydropower as well as downstream releases. Embankments are being strengthened, and relief and rehabilitation measures being undertaken within the affected communities.

The PfR partners were quick to react to the situation. NetCoast coordinated a relief and rehabilitation process supported through the CordAid. However, the partners feel that there are distinct lessons to be learnt on the ways flood risk is conceptualized is the delta. Recurring floods in the delta question the ability of large structures to control floods.

It is important to see the ecological footprint in flooding events within the Mahanadi delta. Floods within a fluvial deltaic system are important constituents of its geomorphology. Floods help fan the sediments and thereby assist in building up of the delta. Traditionally, the farming community living within the delta evolved farming system which adequately distributed crop failure risks emerging through recurrent floods and droughts, and benefitting from the natural fertilization of agriculture lands happening due to floods and resulting inundation. The cropping cycles were distributed across the year so that even if one crop would get affected by floods or droughts, the other two would provide sufficient production to compensate for the loss. Besides evolving rice strains that were timed to virtually dodge the ravages of floods or droughts, cultivators also adopted other risk distributing strategies as cultivating in different classes of soil marked by varying composition, fertility and located at various elevations.

Developmental planning within the region has been inherently contradictory to the symbiotic relationship between hydrological regimes and livelihoods, and focused on structural approaches to support agriculture by harnessing hydrological regimes. The delta was subject to intensive hydrological regulation primarily during the 18th century colonial rule. The dynamic fluvial environment of the delta was constrained by embankments and other hydraulic structures to provide a regulated water supply to irrigated fields and thereby ascertain revenue. In 1957, the Hirakud dam project was constructed on the Mahanadi River for hydropower generation and as a major sediment trap for an intercepted catchment area of 83,500 km^2. Weirs were constructed at the head of the Mahanadi delta to capture the downstream hydropower water release to irrigate 1.36 million hectares. Subsequently, the Bhargabi and Daya distributaries were embanked to Chilika as a flood preventive measure in irrigated areas. The Mahanadi delta command area presently has 1038.10 kms capital embankment and 403.19 km of other agriculture embankments. Later development in the delta emphasized on the extension of these activities without reviewing their long-term implications and taking into consideration views of the communities. Further, increasing population in the delta led to contamination of water resources due to lack of sanitation facilities.

As an outcome of the water resource management which has failed to understand the role of fluvial regimes in deltas, the communities have been rendered flood vulnerable rather than flood dependant. With the flow connectivity impeded by embankments, the delta faces severe waterlogging which leads to lower agricultural productivity as well as diseases attributed to stagnant waters. Assessment based on remote sensing imageries indicate that the extent of wetlands has declined considerably due to loss of connectivity with the river regimes and changing land use pattern in the delta, especially in the central deltaic region. During the period 1975 – 2010, nearly 30% of wetland area has been lost. The overall agricultural productivity has been highly affected by poor drainage conditions due to embankments. Small land holdings and limited opportunities for occupation diversification has led to high poverty in the region.



The PfR partners were conducting a risk assessment in Puri district a week before the floods struck. The communities were looking at river basin maps, figuring out why merely raising embankments would not suffice to reduce flood risks. There was need to restore wetlands as well which act as natural buffers to floods. The floodplain needs to be reactivated, and the embankments managed to release waters in controlled quantity to ensure that in-channel sediment deposition is reduced. Additionally, the hydrological connectivity needs to be ensured that the water flushes out between systems. Further, collaboration with research organisations is required to have a better understanding of climate change impacts.

Flood inundation in Mahanadi Delta on September 12, 2011
Source: http://www.orissa.gov.in/disaster/src/RAINFALL/Memorandum%20on%20floods%202011-Final/MEMORANDUM_FLOOD_2011.pdf accessed December 12, 2011

Box 2: Building Livelihood Resilience in Changing Climate

Report of Asia Regional Conference, 3 – 5 March 2011, Kuala Lumpur, Malaysia

Asia, home to over 60% of human population presents a strikingly contrasting picture of economic growth and human development. The United Nations Millennium Development Goals report of 2010 highlights that the proportion of undernourished people in the region has swelled to levels last seen during the nineties. While already burdened with challenges of food and water security, Asia has also seen an unprecedented increase in the number of natural disasters which threaten to wipe out the development gains made so far. Their cumulative impact has been disproportionately higher on the poor and vulnerable sections of society. The vulnerability of the poor is further enhanced by the rapid degradation of environmental resources and biodiversity. Climate change and associated drivers and pressures are only likely to make the situation more unpredictable and vulnerable accentuating the burden on poor who often have little capacity to adapt and adjust in changing environments.

Increasing incidence of disasters and consequent stresses on livelihoods and efforts for poverty reduction has led to renewed interest in understanding and conceptualizing livelihood vulnerabilities and devising strategies and actions for creating resilient livelihoods. Several emerging paradigms from ecosystem management, livelihoods and disaster risk reduction sectors can be mapped in this direction. It is also evident that theories, approaches, policy frameworks and actions within these sectors differ on perceptions of livelihood resilience. Individually, none of these present a full-fledged pathway for achieving resilient livelihoods. While an impressive body of knowledgebase, best practices and lessons learnt exist within individual sectors, there are still repeated calls for promoting and communicating an integrated livelihood resilience vision, approach, policy and practice.
In this backdrop, Wetlands International – South Asia in partnership with Cordaid and Ekgaon Technologies organized an Asia Regional Conference on '**Building Livelihood Resilience in Changing Climate**' with an aim *to provide an interdisciplinary platform to researchers, practitioners, and policy makers working within the domains of environmental management, development and disaster risk reduction for developing a shared vision of livelihood resilience in changing climate*. Financial support for the conference was provided by International Development Research Center (IDRC), New Delhi, India and CDKN (Climate and Development Knowledge Network), United Kingdom. The conference was held from 3-5 March 2011 in Hotel AnCasa, Kuala Lumpur, Malaysia.

The conference was set up in the following sessions:

- **Exploring livelihood resilience** *focused on approaches, frameworks and lessons from field implementation related to environmental management, development, disaster risk reduction*
- **Pathways to livelihood resilience** *focused on the role governance; information, communication and technology; markets and technical expertise play in building livelihood resilience*
- **Livelihood resilience – the policy challenge** *aimed at exploring the challenges and solutions in creating policy design for supporting livelihood resilience*
- **Livelihood resilience – Institutional frameworks** *aimed at analysing institutional arrangements with various domains and building a design framework in the context of livelihood resilience*

Overall 54 participants from 14 Asian countries attended the conference. These included non-government agencies (68%), research and academia (15%), policy makers (10%) and media (7%). A live webcast was organized through the web-link http://south-asia.wetlands.org /Portals /13/ Conference.html. The three day conference included 7 keynote presentations, 23 case studies (14 oral and 9 poster presentations), 4 panel discussions and 6 sessions of group discussions. The case studies were selected from over 200 submissions.

Discussions on approaches and frameworks within ecosystem management, sustainable livelihoods and disaster risk reduction highlighted a distinct commonality of aims, i.e achieving livelihood resilience. However, there were differences in ways system boundaries as well as drivers for action were defined and identified. The case studies from India, Bagladesh, Vietnam, Indonesia and China indicated that the local level adaptation to climate change was a continued process as it has imposed new dimensions to existing vulnerabilities due to poverty, sectoral planning, and degrading natural resources.

Discussion on pathways for livelihood resilience cut across the themes of governance; information, communication and technology; markets and capacities. Inadequate interface between various governance mechanisms was identified as a major challenge that needs to be addressed in the context of livelihood resilience. The feedback mechanisms between the local scale (wherein management takes place) and national/provincial scales (which generally set the policy direction) are currently underdeveloped, creating information asymmetries at various levels, and thereby inefficiencies in policy making.
The role of markets in creating resilient livelihoods was recognized, with a call for making these institutions more socially and environmentally responsible. There was also a call for creating adequate safeguards so that the poor and vulnerable sections of the society having proportionately high dependence on the ecosystem services realize equitable and just outcomes from markets.

The session on policy making for livelihood resilience focused on bridging the science –policy divide. Key recommendations that emerged included creation of enabling mechanisms for joint identification and prioritization of

policy needs from research; communicating research in language and form understood by policy makers; and creating entrepreneurial capabilities in research agencies to integrate research into policy making domain.

In summary, the conference concluded that despite there being no universal agreement on the understanding of 'resilience', the challenges in lexicon need not limit convergence and therefore the following attribution could help understanding livelihood resilience in changing climate in Asia:

a) Recognizing change as a fundamental property
b) Having adaptive capacity and transformability to new stability domains
c) Retaining ability to support livelihoods including equitable allocation and benefit sharing of livelihood resources
d) Recognizing urban rural continuum
e) Sustaining ecosystem services as the guiding principle

Development of an integrated framework for livelihood resilience that could address the objectives within the individual domains as well as enable cross sectoral communication was urged. The best way to do this was to invest into joint implementation optimizing synergies and provide evidence that the concepts can work together and add value. While several successful models of creating resilience through ecosystem management, development and disaster risk reduction approaches existed, a pressing need to upscale these to influence the policy environment was identified which could be achieved through conducting research on scalability potential of the interventions on policy relevant parameters; cross sectoral linking and learning and creating knowledge networks which enable sharing of multiple knowledge systems.

3.2 Organisational Developments

Since PfR implementation involves 21[1] organizations other than implementing leads WISA, Cordaid and Red Cross Climate Centre (RCCC), a coordination arrangement was developed in consultation with partners during the inception workshops. The three tier arrangement has the **Programme Management Committee** comprising Head of Office, WISA and CMDRR Advisor, Cordaid with expert inputs of RCCC focal person at the apex being overall responsible for strategy and implementation of the country programme including planning, budgeting, coherence of different approaches, alignment with alliance objectives, overall national level reporting. **Project Coordinator** forms the second rung of the structure and is responsible for day to day project management, communication between partners, compilation of national reports, ensuring compliance to monitoring and evaluation frameworks, coordination of the learning agenda, capacity building. The **PfR Task Force** (comprising representation of CARITAS, CENDERET and NetCoast) will lead field implementation of the projects, compilation of baseline, coordination between NGO partners, and provide support to national reporting.

ASK, a capacity building organization is supporting project implementation by capacity building of PfR network and providing accompaniment support to implementation at field level. A **Knowledge Management Team** has been set up with core representatives from all partner organisations to provide input to the network on the capacity building needs, context analysis, case studies etc. and eventually contribute to the learning agenda. The tasks, roles and responsibilities assigned to network partners are represented in the following matrix:

[1] Includes NetCoast, CENDERET, Cartias and 18 local partners

Intervention levels	Intervention Strategies		
	Livelihood security / poverty reduction	Strengthening civil society	Advocacy and Policy Dialogue
Project intervention sites			
Mahanadi Delta, Orissa	PfR Partners led by CENDERET and Net Coast ASK (accompaniment support)	PfR Partners led by CENDERET and Net Coast Facilitating Agency: ASK, WISA, Cordaid	PfR Partners led by CENDERET and Net Coast Panchayats, Pani Panchayats, Fisher Societies, District Administration
Kosi – Gandak- Son floodplains, Bihar	PfR Partners led by CARITAS ASK (accompaniment support)	PfR Partners led by CARITAS Facilitating Agency: ASK, WISA, Cordaid	PfR Partners led by CARITAS Panchayats, District Administration
State Governments		Orissa: CENDERET, Net Coast Bihar: CENDERET, CARITAS Facilitating Agency: ASK, WISA, Cordaid, CDA	Orissa: CENDERET, WISA, Cordaid, CDA, OSDMA, DoWR, DoEF, OCZMA, DoRD, DoAg Bihar: WISA, CIFRI, DoWR, DoF, DoIrr, DoRD, DoAg
National Governments			WI-SA, New Delhi Cordaid Advisor, NDMA, MoEF, MoWR

ASK: Association for Stimulating Know How; CDA: Chilika Development Authority; OSDMA: Orissa State Disaster Management Authority; DoWR: Department of Water Resource; DoEF: Department of Forest and Environment; OCZMA: Orissa Coastal Zone Management Authority; DoRD: Department of Rural Development; DoAg: Department of Agriculture; CIFRI: Central Inland Fisheries Research Institute; DoF: Environment and Forest Department; DoIrr: Department of Irrigation; NDMA: National Disaster Management Authority; MoEF: Ministry of Environment and Forests; MoWR: Ministry of Water Resources

List of Partners

Organisation/Network	Local Partners	Place of Operation
NetCoast	Suraksha	Jagatsinghpur
	Lok Shakti Vikash Kendra	Puri
	Independent Initiative	Jajpur
	Jageswari Jubak Sangha	Puri
	Kurma Iswaram Sangham	Ganjam
	Pallishree	Khurda, Nayagarh, Kendrapara
	Development Initiative	Puri
	Sakshyam	Cuttack
CENDERET	Swad	Puri
	Dahikhai Jubak Sangha	Nayagarh
	Lok Vikash	Jajpur
	Netaji Jubak Sangha	Bhadrak
Caritas	Muzaffar Diocesan Social Service Center	Sitamardi, Begusarai
	Bhagalpur Social Service Society	Bhagalpur
	Fakirana Sisters' Society	West Champaran
	Bettiah Diocesan Social Service Society	West Champaran, East Champaran
	Bihar Water Development Society	Munger

4 Results achieved[2]

4.1 Community (direct intervention)

Being the first year of PfR implementation, the focus was on identification of target villages and communities and developing risk reduction plans based building on ecosystem management, disaster risk reduction and climate change adaptation approaches. The outcomes of the first year would provide the basis for implementing livelihood interventions to reduce risks and build livelihood resilience. Specific achievements are as under:

a) Identification of target villages and communities

The PfR–India partners, as a part of the two inception workshops held during 9-11 March and 27-29 April, 2011 identified 212 villages within 15 districts of Mahanadi Delta, Orissa and Kosi-Gandak floodplains, Bihar as target villages using hazard, vulnerability, community capacity, presence of local partners and added value of PfR programme as criterions. Overall, the programme intends to undertake direct livelihood interventions for building livelihood resilience of 10,000 households (approximately 7,000 in Orissa and 3,000 in Bihar) reaching out to 40,000 beneficiaries from the identified villages. Table 1 and Map 1 provide further details on location of the target villages.

Table 1: Prioritised districts for PfR intervention in Orissa and Bihar

Name of Districts in Orissa	No. of Villages	Name of Districts in Bihar	No. of Villages
Bhadrak	7	Begusarai	10
Cuttack	5	Bhagalpur	15
Ganjam	5	Munger	15
Jagatsinghpur	6	Paschim Champaran	26
Jajpur	12	Purbi Champaran	13
Kendrapara	19	Sitamarhi	8
Khurda	8		
Nayagarh	18		
Puri	45		
Total	**125**	**Total**	**87**
Total Villages for PfR intervention			**212**

b) Identification of performance indicators and development of baselines

An internal baseline linked to the project logical framework was developed to assist in assessing progress and achievements of PfR investment. A set of qualitative and quantitative indicators at household, panchayat and village level were developed by the Project Task Force. Further validation of these indicators were done through household surveys in 2,000 households (1,400 in Mahanadi Delta and 600 in Bihar, roughly forming 20% of the intended target households) and compiled. Annex II presents the set of indicators against the logframe, whereas compiled household indicators, aggregated at the level of districts is presented in Annex III.

c) Development of risk reduction plans

The PfR India team developed a Participatory Risk Assessment Tool for formulation of risk reduction plans at community level. The tool integrates ecosystem management and climate change adaptation approaches with the Community Managed Disaster Risk Reduction Framework. A key feature of the tool is understanding the landscape, ecosystem and climate contexts to risk while defining hazard and vulnerability conditions. Elements of the tool include (a) Landscape and ecosystem profile assessment, (b) Hazard and vulnerability assessment, (c) Risk reduction plan with specific interventions to reduce vulnerability and enhance capacities. The tool was finalised based on the feedback received from the participants and the global partners (Annex IV).

[2] A summary of activities against the agreed workplan for 2011 is presented as Annex I.

Map 1 : PfR Implementation Sites

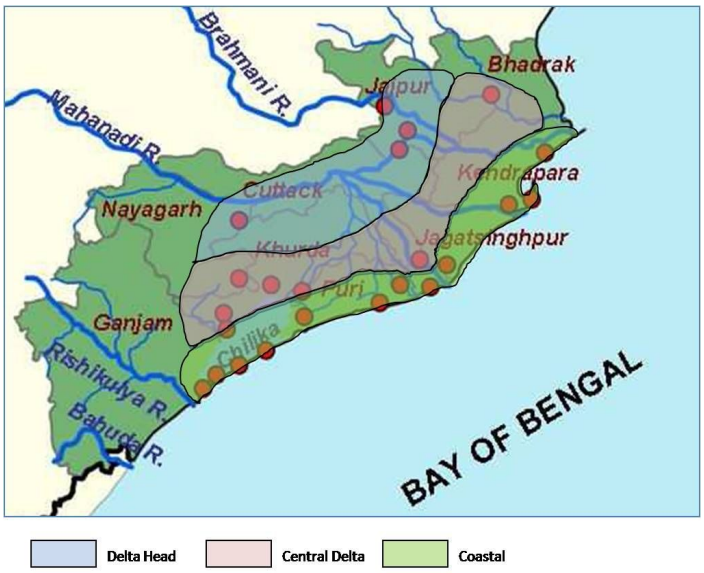
The tool was applied to finalize risk reduction plans in 51 villages (of 6 districts) in Bihar, and 125 villages (of 9 districts) in Orissa. Further, the risk reduction plans have been integrated as part of the Panchayat microplans in 22 Gram Panchayats. A cluster approach is being undertaken to compile the risk reduction plans, further outlined in Box 3.

Box 3: Cluster Approach for Risk Reduction Plans

PfR India works for improving livelihood resilience in 212 villages within 15 districts of Mahanadi Delta and Kosi-Gandak floodplains. Risk assessments are being conducted in each of these villages to formulate intervention plans. However, this poses significant compilation and monitoring challenges as each of these villages would have an individual plan, often failing to connect with each other, and thereby being unable to address risks that operate at higher scales as watershed or delta segments.

A cluster approach is therefore being adopted to enable linking risk reduction plans for villages located in similar risk contexts and having opportunities for joint actions.

An elucidation of the approach is done for the Mahanadi Delta, Orissa. The overall delta environment can be broadly categorized into delta head (with dominant riverine environment), central deltaic region (active floodplains fragmented by hydraulic structures and subject to extensive waterlogging) and coastal region (with dominant coastal processes). The hazard patterns of the villages within any given cluster bear a strong commonality, for example most of the coastal villages face the hazards in the form of tidal inundation, coastal storms, saline intrusion and coastal erosion. However, if the risk reduction plans are limited to village boundaries, the interventions take the form of constructing structures that reduce the intrusion of sea water or protect from cyclones and so on. Taken as a cluster, coastal villages can jointly invest in greening the coastline, maintaining free flow of water to reduce waterlogging, better management of upstream hydraulic structures and several other options. It is possible to then plan for climate adaptation interventions at reasonable scale.



Map 2 : Clusters identified for risk reduction plans in Mahanadi delta region

In the revised scheme, the village level contingency plans would still be at the centre, but the interventions therein would be reviewed using ecosystem management and climate change adaptation criterions. Additionally, there would be interventions that would be taken up jointly in the cluster to enhance resilience. This would not just be limited to physical interventions, but also linking with policy processes and capacity building.

Similar approaches are being finalized for Kosi-Gandak floodplains in Bihar.

4.2 Civil society (capacity building)

The PfR-India is implemented by partners of Netcoast, Cenderet and Caritas. The focus of civil society capacity building was on the 21 partner organizations linked to PfR India programme. A list of workshops, exchange visits and field trainings conducted is presented as Annex V.

During the inception workshop held on 9-11 March 2011, the PfR partners were introduced to the concepts of resilience and linkages of EMR, DRR and CCA. An exchange visit of NetCoast partners was organized to Bettiah, Purbi Champaran during 6-9 April 2011 to gain an understanding of the risk assessment process. This was followed by a planning workshop during 22- 28 May, 2011 on the DRR approaches. This was attended by 22 members of the NetCoast network wherein risk assessment was piloted in 2 villages of the Kanas and Astaranga Blocks of Mahanadi Delta, Orissa. Workshop on Participatory Risk Assessment was held during 25-27 July 2011 at CENDERET, Orissa. The workshop, attended by 41 PfR partners from Orissa and Bihar focused on building livelihood resilience using EMR, DRR and CCA as tools.

PRA in progress at Majholia, West Champaran

Focal group discussion in Mohanpur, Begusarai, Bihar

Village level demonstration programmes of PRA tool were organised for the local partners in Puri district, Orissa during 2-6 August 2011 and Bettiah during 15-19 December 2011. The programme focussed on an integrated approach of DRR, EMR and CCA to assess the physical, human and ecological elements at risk. The most important feature of the programme was use of GIS maps to understand the risk context. PRA demonstration was followed by a village level data compilation workshop during 13-16 November 2011 in two selected villages in Puri District. Compilation formats on disaster risk and natural resource were shared with partners to collate information for building risk resilient plans at village and cluster level.

Box 4: Applying integrated approaches for developing risk reduction plans: a case study from Mahanadi Delta, Orissa

The PfR India developed an integrated framework for formulation of risk reduction plans building on ecosystem restoration, disaster risk reduction and climate change adaptation approaches. One of the key features of the framework is assessment of risk context, particularly the landscape and socio-ecological settings as a means for identifying risks and developing response strategies. This case study summarizes outcomes of application in two coastal villages of Astarang Block of Mahanadi Delta, Orissa.

Udayakani and Tandahara are two coastal villages located within the Devi estuary. The River Mahanadi distributaries Devi, Prachi and Kushabhadra fringe the settlements on the landward side whereas a narrow sand bar with casuarina plantation separates them from the Bay of Bengal (Map 3). Agriculture is the mainstay of livelihoods of the 106 households living within these villages. Though 68% of the households own agricultural land within the village, being located on an estuary, agriculture is routinely affected by monsoon floods and thereby only winter crop is grown. Crop production is meagre and insufficient to meet the livelihood needs, and thereby almost all households work as wage labourers in nearby agricultural fields, whereas some also engage in beetle cultivation (9%) and fishing (5%). Water for drinking and household purposes are primarily drawn from shallow borewells and are mostly saline. Cows and goats are owned by households primarily for milk.

Tandahara communities discuss trends in hazards

Livelihoods and assets in Udayakani and Tandahara are routinely affected by floods and saline water intrusion. With each monsoon, the rivers flowing into the estuary swell and inundate major parts of the two villages. The embankments constructed on the village fringes are of little help in preventing floods and on a contrary create extensive waterlogging, extending to over 15 days in normal monsoon and for more than a month during high monsoon years. Since the period of waterlogging almost corresponds to the harvest of summer crop, the villagers have abandoned the practice and limited into winter crops only. The intensity of floods is further aggravated by narrowing of the river mouth which delays discharge of floodwaters into the sea. The region is also experiencing increasing salinity in groundwater which is affecting water availability as well as agricultural lands. Over the years, the area of agricultural land fit for cultivation is shrinking, and so is the overall productivity (Fig. 1). The village coastline is also gradually eroding reducing the area of beaches and affecting the coastal plantations. As the seaward plantations become sparse, the sea-winds deposit sand and salt all over, leading to loss of foliage, retarded growth and gradual death of plantations. In summers there is an acute shortage of fodder and drinking water. As the distributaries carry only meagre flows in non-monsoon periods, saline water percolates to large areas, and has rendered the 5 village ponds and 7 wells saline and dysfunctional for use.

Individual households cope with floods by storing grain, fodder and fuel before the onset of monsoon. Every monsoon, the inhabitants rush to the nearly cyclone shelter and high grounds. Mobiles serve as means for information sharing during the periods of duress. Collective coping and adaptation mechanisms are lacking. The

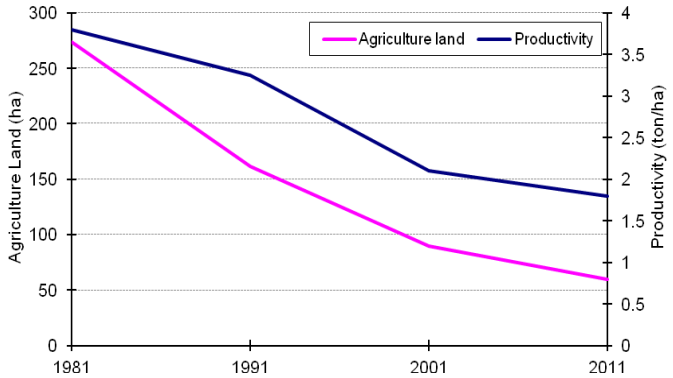


Fig. 1: Decline in agricultural land and productivity over three decades

Loss of foliage leading to degraded plantation area

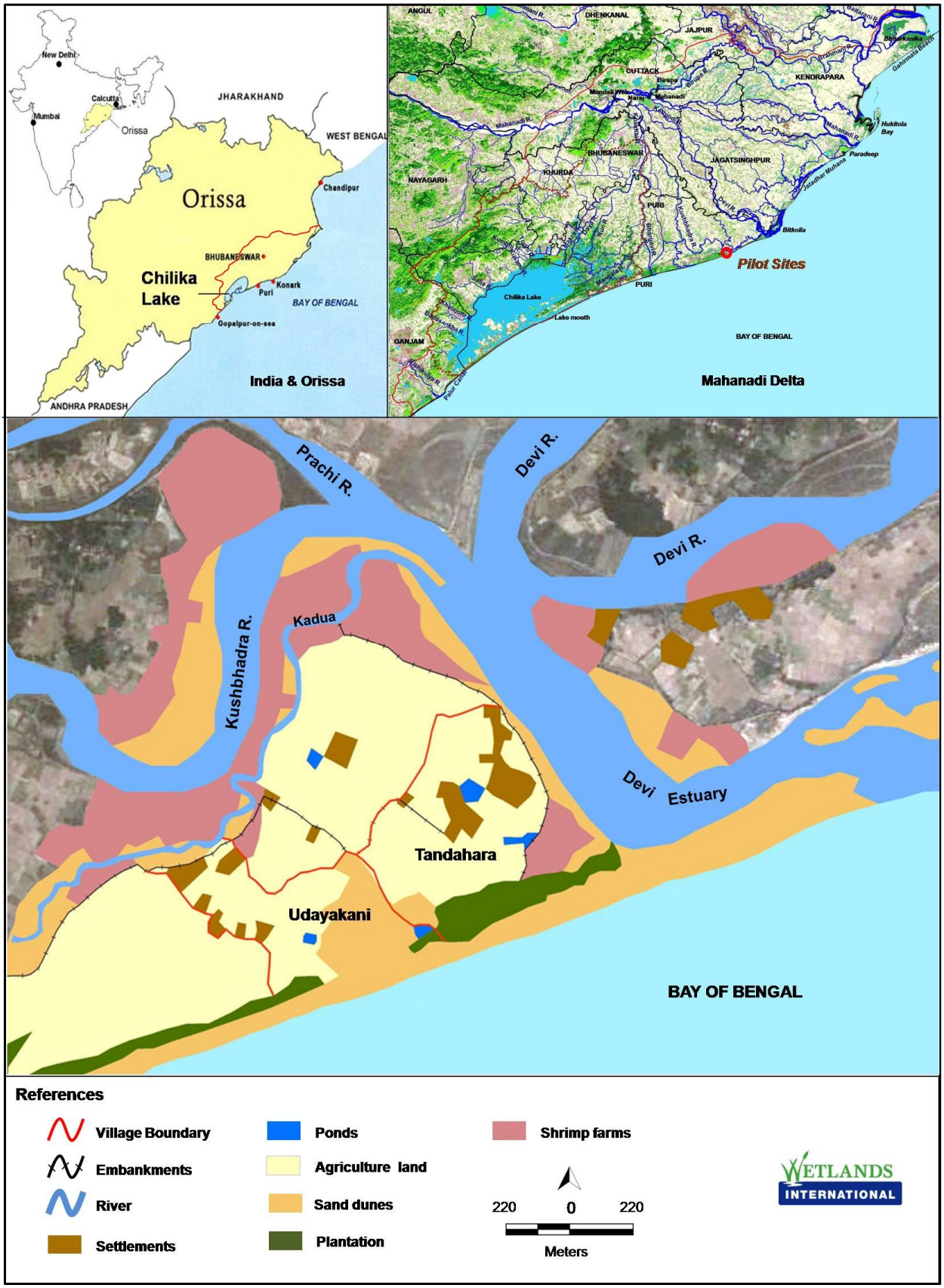
villagers feel that with increasing coastal erosion and instances of devastating floods, the dependence on employment opportunities outside the village would increase, and the settlements would have to gradually keep moving away from the shore. The government did allot the villagers productive agricultural land outside the village, but these are not used as their location is very far away and it is not possible to protect the crops till the harvest season.

The risk reduction strategy that emerged from the assessment highlighted several intervention options and capacity building needs. Given the estuarine nature of the landscape, salinity would be a perpetual challenge, and thereby introducing salt tolerant crops would be most suited to the conditions. However, the freshwater wedge could be increased by revitalizing and harvesting rainwater with vegetative bunds. The skills sets of the households could also be broadened to reduce dependence on agriculture. Forms of enterprise as aquarium fish, ornamental shell making could be introduced as these are based on available resources. The structure and location of embankments could also be redesigned to reduce waterlogging. Shelterbelt plantations would assist in reducing coastal erosion as well as reducing the impact of salt and sand that comes in with the sea-wind. Secondly, community preparedness to disasters would need to be enhanced by strengthening local institutions and developing effective early warning systems. However, the fluvial regimes and coastal processes could only be addressed through Integrated Water Resources and Coastal Zone Management Planning. The communities would need to participate in these processes clearly articulating the impacts of siltation and closure of river mouth and declining flows. The coastal protection could also be strengthened if longer areas of coastline are vegetated creating natural protection barriers. As a matter of priority the community would first of all engage in revitalizing the water sources and greening the coastline, while simultaneously investing into institutions to enable better disaster preparedness.

Developing the risk reduction plans in the context of the landscapes and ecosystems has enriched the planning process and identification of interventions. Firstly, the village level interventions identified are done with the fact that salinity would be a permanent feature of the landscape. The role of coastal ecosystems in providing protection as well as regulating water regimes is integrated into the implementation strategies. Building institutions for community preparedness would be central to the propositions. Creating awareness to the villages on the coastal and riverine processes and the impacts of climate change would help understand the changes in the coastline better and identify suitable adaptation strategies. Finally, the communities emphasize that coordinated actions would be required at the entire coastline level and they would need to participate proactively into design and implementation of coastal zone management plans and interventions.

Credits: Participatory Risk Assessment was carried in Udayakani and Thondahara in the months of September, 2011 and January 2012 by Satish Kumar (Wetlands International- South Asia); Munish Kaushik (Cordaid); Prakash Layak, Allen and Divya (ASK); Durga Prasad Dash and Netcoast team; Jaykrishna Behera and CENDERET team. The case study was compiled by Pranati Patnaik (Project Coordinator, PfR – India). The support of Udayakani and Tandahara communities is gratefully acknowledged.

Beetle leaf cultivation forms an alternate source of income



Map 3: Location map of pilot sites

4.3 Institutional environment (policy dialogue)

Activities under institutional environment focused on engagement with the Orissa State Integrated Coastal Zone Management Authority, National Disaster Management Authority (NDMA) and the Ministry of Environment and Forests, Government of India.

The Government of India, as per the provisions under Disaster Management Act, 2005 has initiated the process of District Disaster Management Plan (DDMP). The district level plans in existence had several gaps, key being lack of baseline/risk data, lack of clarity in roles and responsibilities of institutions, too much voluminous and emphasis on events post disaster. DDMPs stipulated under the Act are being formulated as per an improvised template developed through extensive stakeholder engagement. The National Disaster Management Authority (NDMA) has identified Mahdubani District within Kosi – Gandak floodplains in Bihar as a model district for the purpose. Development of DDMP template is led by Sphere India (a National coalition of Humanitarian Agencies). The template developed as a result of the collaborative exercise has a better coverage of baseline information on the risk and hazard characteristics and clarity on roles and responsibilities of all participating institutions. Most importantly, these plans have a focus on disaster preparedness based on proper risk assessment along with communities. PfR is contributing to the process through participation of Cordaid in the core DDMP formulation team, and review support by WISA. Through PfR, the DDMP template now includes ecosystem management as part of the risk assessment as well as disaster preparedness actions. The DDMP process has been rolled out in two PfR districts, Bettiah in Bihar and Puri in Orissa.

PfR-India also assisted National Institute for Disaster Management (NIDM) in delivering the UNEP-Partnership for Environment and Disaster Risk Reduction (PEDRR) course on “Ecosystem Management Tools for Disaster Risk Reduction” held on 12 – 15 December, 2011 at NIDM, New Delhi. The course was attended by 23 DRR professionals for India, Nepal and Afghanistan. The participants were introduced to the concept of ecosystem based DRR through a field visit to the River Yamuna floodplains in New Delhi followed by a presentation on use of Integrated Water Resources Management as a tool.

PfR (through WISA) worked with MoEF on the CBD agenda to ensure that the role of water in ensuring ecosystem services and biodiversity conservation, fundamental to ensuring their role in disaster risk reduction, are appropriately recognized and highlighted. Specific inputs were provided to the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA -15) agenda, which were extensively used by the Indian delegation in securing higher visibility accorded to water in biodiversity conservation targets.

To support mainstreaming of the role of integrated management of water and wetlands in disaster risk reduction planning in Bihar, PfR-India has commissioned a film ‘Jaltantra’ for use in policy and advocacy. The film highlights the crucial role played by the network of rivers, floodplains and wetlands in securing livelihoods and reducing risk; their rapid degradation due to sectoral and structural approaches to water management; and options for revitalization of water-wetlands network for the securing livelihoods and reducing risks to communities living in Gangetic floodplains. The film will be showcased in the learning cycle event of Cordaid, scheduled to be held during February 15–20, 2012 at CENDERET, Bhubaneswar.

Participants of UNDP - PEDRR course visiting floodplains of river Yamuna