

Climate Change in the Coast of Bay of Bengal: Impact, Resilience and Implications

Summary Report and Call for Action



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Title: Climate Change in the Coast of Bay of Bengal: Impact, Resilience and Implication – Summary Report and Call for Action

The report is an abstract of the Baseline Study Conducted by Concern Worldwide for the Paribartan – Multi Country Initiative on Increasing Resilience and Reducing Risk of Coastal Communities to Climate Change and Natural Hazards on the Bay of Bengal.

The Summary Report is prepared by: Mr Khurshid Alam- Managing Director, ThinkAhead Limited and Mr Saroj Dash- Technical Program Coordinator, Concern Worldwide.

Study Conducted By: ThinkAhead Limited and Concern Worldwide

Partner in India: Regional Centre for Development Cooperation (RCDC)

Partners in Bangladesh: Juba Jagrata Sangha (JJS) and Shushilan

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Concern Worldwide has launched a multi country initiative titled 'Paribartan– Multi Country Initiative on Increasing Resilience and Reducing Risk of Coastal Communities to Climate Change and Natural Hazards on the Bay of Bengal covering coastal regions of both Bangladesh and India. This study report was prepared as a baseline for Concern Worldwide' (CWW) climate change resilience and adaptation programme being implemented in the state of Orissa of India and South West Coast of Bangladesh. The summary report outlines the key trends and findings of a longitudinal action research initiative launched as part of the program strategy to facilitate a Community Based Climate Change Information System. The first year report establishes issues pertaining to extreme poverty and vulnerability to climate change.

I N T R O D U C T I O N

This report presents the views, of hundreds of poor people living in the coast of Bay of Bengal, about climate change and its impact on their life, livelihood and environment. Concern Worldwide shares this report to wider public and policy makers considering its possible contribution to the ideas and knowledge that shape current climate change policy and actions in the study areas as well as international climate change negotiation in Durban in November 2011.

The study focus was selective to the baseline indicators of the project. But it also produced far greater analysis and views sufficient to raise significant issues relevant to today's climate change discourse. The report was developed by September 2011, by an experienced team in Bangladesh and India, with support from a group of climate change specialists along with the support from the program team of CWW and partners in India and Bangladesh. This study covered four districts in Bangladesh i.e. Khulna, Satkhira, Patuakhali and Borguna and two districts i.e. Kendrapara and Jagatshingpur of Orissa state in India. The study team utilised CWW's Asset, Inequality and Risk framework for understanding extreme poverty as the base for designing the study and the key highlights of the analysis is outlined as following;

“RISK AND VULNERABILITY: Studyteam investigated how climate change influences nature and pattern of risks and vulnerability due to extreme events of in the coastal Bay of Bengal”.

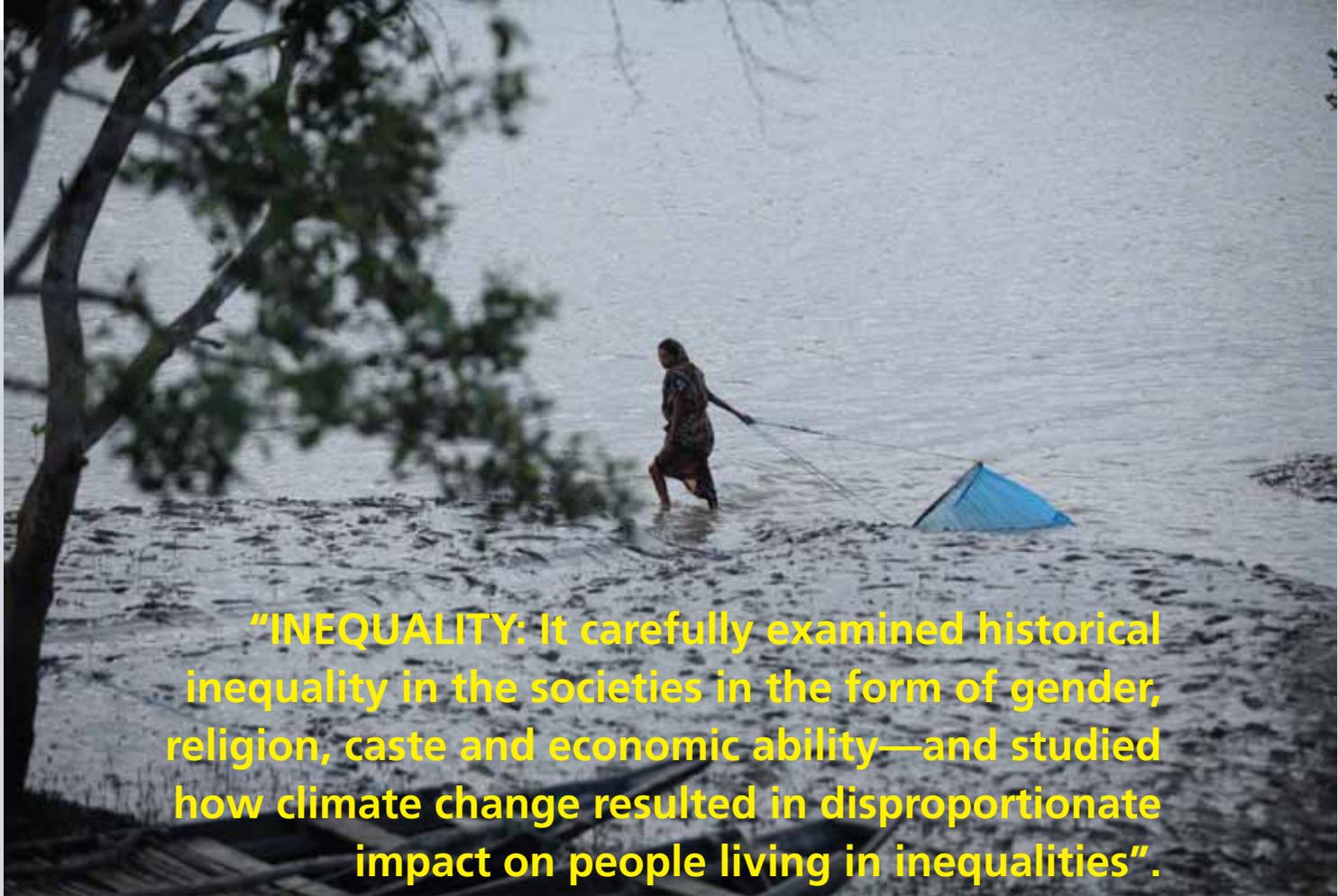


INCREASE IN DISASTER FREQUENCY

The study populations in both coasts experience multiple hazards some of which are shared and some that are common in nature. The shared hazards include cyclone and sea level rise, while common hazards include flooding, drought, tidal surges, and coastal erosion. The Bay of Bengal remains the source of majority of these hazards while intensity of common hazards varies due to an array of localized factors.

All study HHs were affected by at least one disaster in last 15 years. However, the number of times that they were affected by disaster varies largely by the country - more than 50% HHs in Bangladesh coast have been affected more than three times during the same period. The population in Bangladesh experienced two mega cyclones since 2007; and in Orissa, Jagatsinghpur and Kendrapara experienced the super cyclone in 1999. Common hazards reported by the people in Orissa and Bangladesh's southwest coast include tidal surge, flood and drought. The flooding has been reported beneficial by some villagers in Orissa, where salinity is a major problem as it washes out the salinity contamination in water and soil. The frequency of drought is increasing in Orissa with major consequences on crop, livestock and poultry.

The increased frequency and intensity of the hazards alters risk exposure of the coastal communities already in the top list of countries with cyclone mortality risks index (UNDP). This will increase the potential affected population by 177%. Alam et. al. (2009) suggested that increase in localized and low intensity hazards (such as sea tide) can increase vulnerability to high impact hazards (such as cyclone and flood) as they weaken disaster protection infrastructures such as embankments.

A woman is wading through shallow, rippling water, pulling a blue net or trap. The scene is set outdoors, with a tree on the left and a body of water extending to the horizon. The text is overlaid on the lower portion of the image.

“INEQUALITY: It carefully examined historical inequality in the societies in the form of gender, religion, caste and economic ability—and studied how climate change resulted in disproportionate impact on people living in inequalities”.

SPECIFIC IMPACT ON WOMEN AND CHILDREN

Climate change impacts such as bio-diversity degradation, food insecurity and increasing disasters have affected already fragile human security of women in both study locations. Traditional and modern gender role makes women more vulnerable and less capable to adapt with climate change. Women also receive less information than men and increase in workload prevents women from participating in the formal decision making. More women die in disasters not because they are physically weak but social inequality. A 2006 study of 141 natural disasters by the London School of Economics found that when economic and social rights are fulfilled for both sexes, the same number of women and men die in disasters.

The baseline study documented a range of specific and additional impacts of climate change on women and children. Existing gender role and inequality in both coasts make women specifically vulnerable to climate change. The impact is experienced by women on three specific areas: direct impact on available economic activities, increase in hardship and reproductive health.



The first impact is on women's economic activities which are considerably hampered by climate change in most study villages. Many women are reported to have lost control over their income due to changes in biophysical environment, exacerbated by other development factors such as imposition of new forest conservation laws and expansion of commercial shrimp farming. Women also mentioned about increase in workload to manage food for their families. Similarly, the effect on homestead based agriculture force women to take up hazardous income generating options such as collecting shrimp fry from the sea.

The second impact is related to increased hardships that were particularly mentioned in Bangladesh. Women and young children are currently engaged in collecting water from distant sources (as high as 60%) due to unavailability of water sources near their homes.



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The third impact is on the reproductive health of women with deterioration of nutrition as major cause in both the coasts. The lack of health facilities in Bangladesh and the large distance to health facilities in Orissa are two other causes adding to the deteriorating health conditions. As drinking water gets expensive, many women started drinking less water. Finally, prolonged stay in saline water for fish fry collection not only causes physical stress and social insecurity but also puts a strain on their reproductive health.



“LACK OF RETURN ON ASSETS: Taking a broad definition of asset, it examined how climate change impact on social, political and economic asset of poor people and how comprehensive protection of these assets can enable poor people to adapt with climate change.”

IMPACT ON ASSETS AND FOOD SECURITY

Rain-fed agriculture i.e. paddy cultivation, fishing and livestock is the major source of livelihood for the study population. These are becoming increasingly exposed to climate change through increased salinity, erosion, tidal surges and cyclone. Up to 85% people living in rural Orissa are dependent on agriculture and at least 60% of agricultural activities depend on rain. Similarly, rain dependency characterizes the agriculture in Bangladesh coast.

Crop yield has been substantially reduced in all study villages due to a number of factors related to change in the climate and in particular to salinity intrusion. This is prevalent in all study villages in Bangladesh although its degree varies and the areas have become new pockets of poverty marking a change in the geographical distribution of poverty. The farmers reported decrease in paddy production which is due to lack of rain in recent years.

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The second reason is the unavailability of fresh water for irrigation. Lack of fresh water from upstream during dry season has forced farmers to grow Aman (a local variety of paddy) only in the monsoon. This situation has increased the dependency of farmers on the conditions in the monsoon season; however, even the monsoon cannot help farmers in areas where salinity is severe (e.g. villages affected by Aila).

Cyclone also destroyed crops as the cyclone season overlaps with the cropping seasons of the study locations. Cyclone Sidr for example, destroyed all the standing crop in an area of 1.6 million acres. The Orissa super cyclone also caused a similar problem in 1999. Sand casting brought in by tidal surges and cyclones have been mentioned by farmers as a major threat in villages affected by cyclone Aila and Sidr.

Homestead based gardening and fruit production constitutes to almost 16% of the income or expenditure saving of rural households (especially for FHHs) in Bangladesh (CPD 2004). Although the study population in Orissa did not experience acute nature of the problem, their homestead gardens had been destroyed since the super cyclone in 1999. In many villages, people are not able to grow kitchen garden due to regular flooding, tidal surges and salinity.

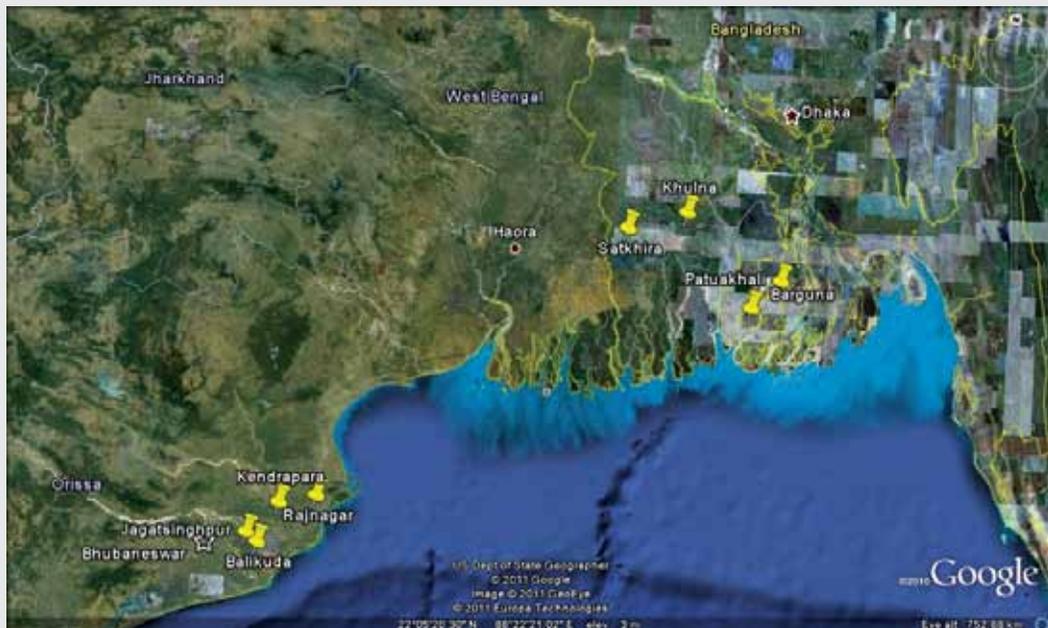
Climate change has a significant impact on livestock. Livestock population substantially declined in cyclone Sidr and Aila with similar impacts felt after the Orissa super cyclone. The poorer people in Bangladesh coast were left with no animal at all due to lack of fodder in both Aila and Sidr affected areas. Increased salinity affected supply and prices of fodder. The experience was similar in Orissa where the super cyclone killed as high as 90% of domestic animals that people were not able to recover (ICM 2003).

CLIMATE CHANGE CONTEXT IN BAY OF BENGAL

The catchment area of the Bay of Bengal, the world's largest bay, is home to 400 million people. Although poverty reduction is high on agenda and action in both the countries it remains as one of the biggest development challenges. More than 50 million people are still living in extreme poverty (BBS 2006), while Orissa with a population of 40 million has the highest incidence of poverty. Nevertheless there has been progress in reduction in poverty rate. Incident of poverty reduced to 32.5% in 2011 from 51% in 1995 in Bangladesh and Orissa's Human Development Index (HDI) increased from 0.27% to 0.40 since 2001.

Climate change is now among the key drivers that perpetuates poverty in the coastal region of Bay of Bengal. The Intergovernmental Panel on Climate Change (IPCC) concludes South Asia and the Coastal Region of Bay of Bengal as among the world's most vulnerable regions.

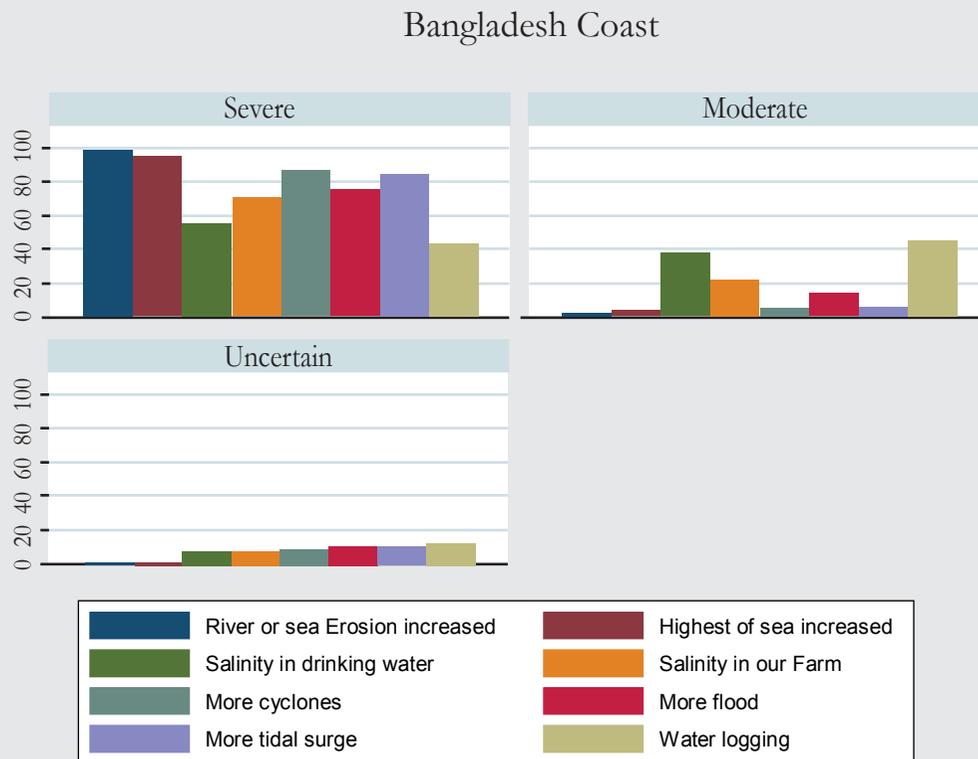
This would not only increase mortality risk because of increased frequency and intensity of disasters, but also alter the bio-physical and hydro-meteorological character - such as changes in precipitation, increase in salinity intrusion and the rise in sea level leading to the displacement of millions of people. Cyclonic pattern has been changing in South Asia where more than 750 million people have been affected by weather related disasters since 1990. Cyclone frequency during November and May over the North Indian Ocean has increased two-folds in last 122 years. The World Bank estimated that agriculture, on which majority of the population depends, will be severely affected by changes in the monsoon dynamics caused by changes in the conditions of the Bay of Bengal and the Himalayas. This projected sea level rise could flood the homes of millions of people living in the low-lying areas of South Asia.



KEY FINDINGS

1. The coastal communities in the Bay of Bengal are already experiencing climate change, as predicted and observed by the scientific community. The study finds changes in the selected areas of biophysical environment in both Orissa and South West Coast of Bangladesh - which the livelihood of majority of the people depend on. Although the nature of changes follows a similar pattern across the coasts, the degree varies according to localised physical characteristics. The major changes as experienced in the study villages include: salinity intrusion in water and soil; increased frequency and intensity of tidal surge, sea coming closer and coastal erosion; and increase in cyclonic events.

Nature and Degree of climate change impact observed by vulnerable people

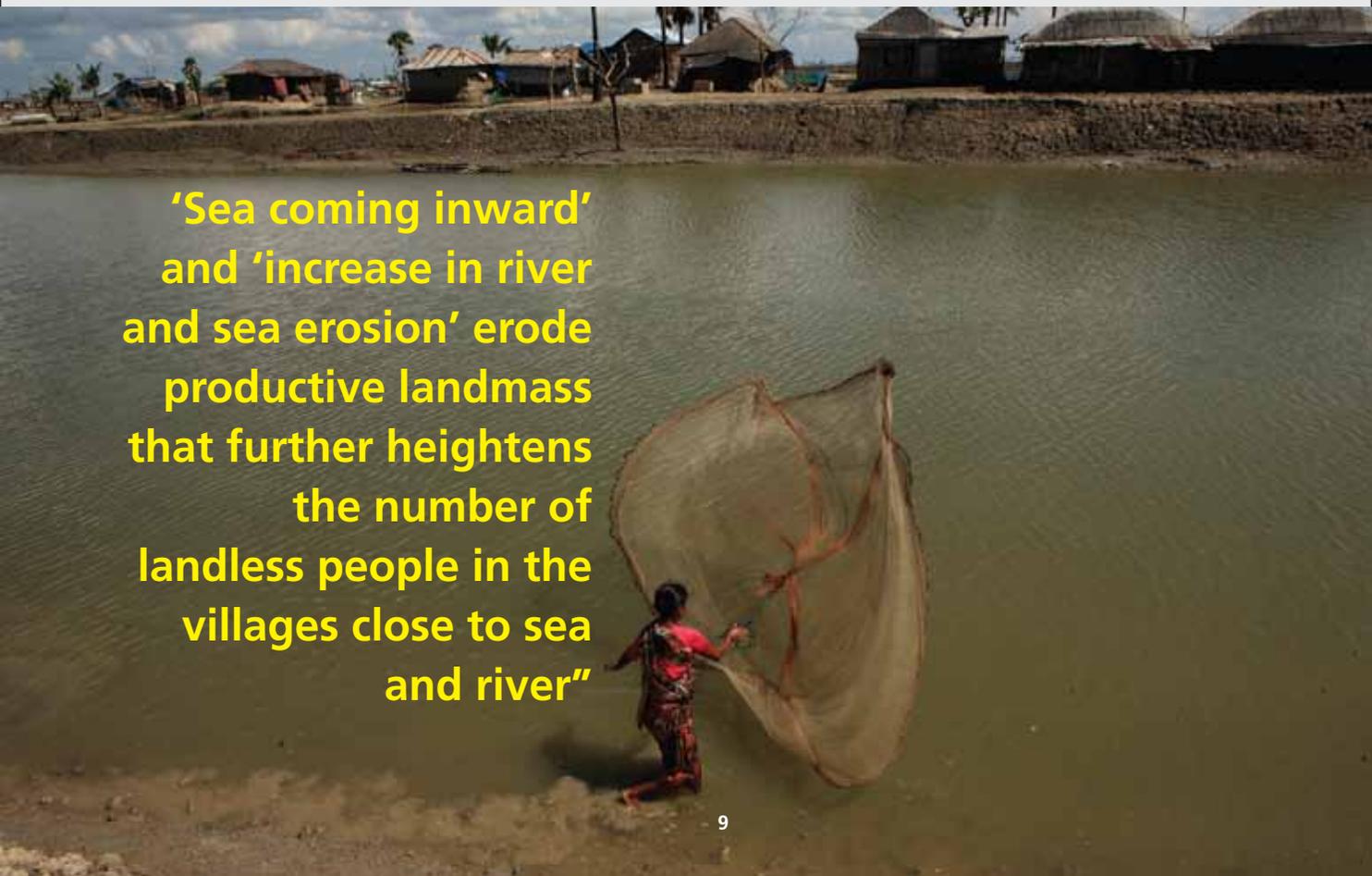


2. These changes have considerable implications on the quality and volume of natural resources i.e. soil; ground and surface water; grazing land and fish catch in the villages where salinity intrusion is most acute. Their combined implication has been felt on food and nutrient security of the population. They have reached a stage at which people cannot cope with their existing resources and technologies as observed in at least in 12 study villages in Bangladesh and Orissa.

3. Majority of the people in the study villages are poor and are going through change in their livelihood, which is primarily due to the change in the bio-physical environment. Agriculture, which is the primary source of livelihood, is completely destroyed in four villages of Bangladesh and moderately affected in some other villages in Orissa and Bangladesh coast. Supplementary livelihood of rural household such as homestead gardening, poultry and animal husbandry have been affected - complete destruction in the villages affected by cyclone Aila.

4. In these areas cropping is no longer a viable option and significant reduction in crop yield is taking place forcing people to migrate, or rely more on safety nets or options for day labour. Sharecropping, a major source of livelihood for people in Bangladesh and Orissa coast is no longer available to them as landowners have become more interested in shrimp farming. This is due to increase salinity in the land and water that reduces yield.

5. By now many studies concluded increasing frequency and intensity of cyclonic events in the Bay of Bengal. The study population too have experienced such changes in pattern and nature of hazards such as cyclone, flooding, drought and tidal activities. For example, people experience more intense tide in the form of heights and geographical coverage. 'Sea coming inward' and 'increase in river and sea erosion' erode productive landmass that further heightens the number of landless people in the villages close to sea and river. Combined with increasing cyclone occurrence (and frequent cyclonic warning) and sea level rise, there is prevalence of significant fear among the study population.



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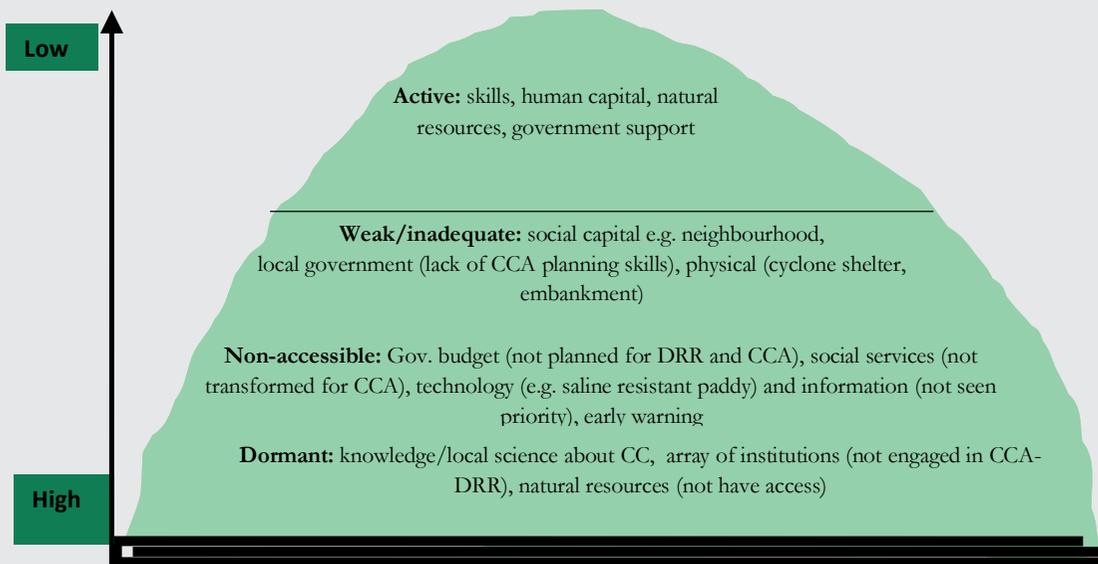
6. The vulnerabilities of the population to current disaster and climate variability are more likely to contribute to the vulnerability to predicted climate changes. Historical inequality between sexes, ages and powerful and powerless continue to determine people's vulnerability to climate change. Climate change not only creates an impact on existing inequality but the same inequality limits people's ability to access adaptive resources such as information, fund and technology and ability to influence climate change policy and actions. This study indicates that the impact of past disasters was higher on the people living at bottom of wellbeing ranking. The other immediate vulnerability includes access to natural resources, fragile physical environment, limited preparedness at HH and institutional level and lack of knowledge to adapt to climate change.

7. Women are clearly taking on more burdens than men; for example, women collect water from distant sources. Poor household having to resort to buying water are restricting/limiting their expenses on other developmental investments such as education; and many people belonging to poor households and landless are migrating to cities simply because the available natural resources found in former dwelling area can no longer provide adequate income. The poor women are taking greatest burden in providing security for their families as they engage in risky livelihood options as observed in many villages in the study locations. While most women catch fish fry in rivers, certain others migrate to metropolitan areas to work in garments factories that increase not only their physical stress but their social insecurity as well. On the other hand it is clear that people have limited knowledge about the decision making at the village level and above; they have little participation in the community level planning process. This analysis highlights the likelihood of vulnerable people's participation being missed out in future climate action and policy at the local level.

8. Intensity of such problem contributes to increased migration although lack of previous data limits the study to conclude whether migration has been increased. There are insignificant but new trend of cross-border migration evident in certain villages of Bangladesh.

9. The study documents an array of coping activities to existing climate change impacts. They are most likely to exceed once the degree of impacts go higher. Thus transformation of coping strategies to adaptive ones requires urgent investment to prevent the population from falling into further poverty and becoming exposed to disaster mortality. This study highlights that building climate resilient communities requires three concrete actions at the local level- protection from direct impact of climate change, building people's ability to accessing climate resources and investment on empowerment to influence climate policy and actions. Public and NGO investment have so far been highly engaged in the first actions while later two remain areas with significant gaps. Introduction of saline tolerant paddy, improved access to early warning and increasing investment on disaster risk reduction already started to pay off. A significant portion of the study population is not aware about climate change and various planning process in the villages and local government levels.

10. An array of active and dormant institutions exists at the local level in Orissa and Bangladesh coasts. These institutions lack significant knowledge and skills required for climate change planning and implementation at local level. Climate change planning in Orissa and Bangladesh, intensified recent years, is yet to reach the local level. They have creditable understanding about urgency of climate change. Increasing degree of climate change impact requires a maximisation of capacity. The study identified three key actions for this. First is the transforming of dormant institution to active one otherwise likely climate change resources flowing to the local level would be least effective. Secondly, the climate change impact of current scale cannot be mitigated until there is a shift towards the decentralization of planning process. The third dimension is to maximize household and community level capacity by identifying and addressing the capacity that are currently dormant or inactive.



Capacity to undertake mitigation and adaptation activities (source Alam, K et al (2008))

11. Communities' initiative to address the climate change problem is evident in both coasts. These initiatives range from the formation of new forms of institutions in managing sluice gates to collective initiatives in maintaining embankments, raising homestead, maintaining water channels and drains. It is also evident that the capacity of communities to come up with innovate solutions to the climate change problem largely depends on the scale of the problem. The communities tend to be more innovative where the scale of the problem does not exceed the existing capacity. Collective innovation is limited where scale of the problem is acute and significant on all aspects of life and livelihood of the poor people as people invest their full capacity in managing their livelihoods.

12. The study highlighted importance of rethinking some of the developmental policies such as expansion of commercial shrimp farming, commercialisation of common property resources; water management and infrastructure development as they in some cases exacerbate the impact of climate change changes.

IMPLICATION OF THE FINDINGS ON POLICY AND CALL FOR ACTIONS

1. ACCELERATING CLIMATE CHANGE ACTIONS.

People living in the coast of Bay of Bangle are already experiencing impact of climate change. Chronic poverty and historical unmet humanitarian need have exacerbated the impact of climate change making it acute in nature today. The condition has excided people's current capacity to cope. Current national and international climate actions do not match with the urgency of the situation. This clearly calls for speeding-up of national and international actions with adequate resources to protect human security of the vulnerable groups. Governments should advocate formulating international legal framework as the basis for humanitarian response within UNFCCC framework.

2. ACTION ON INEQUALITY IN CLIMATE CHANGE CONTEXT.

Climate policy and actions can only ensure justice if they are addressing the historical inequality in the society. These must ensure that people living in inequality in the form of sex, physical ability, generation and ethnicity have equitable access to information, technology and resources to adapt with climate change. These groups of people currently not only affected more but also have least access to these resources required for adaptation. Specific measures must also be taken to build ability of these groups to influence local and national climate actions for including their concerns. Currently, these groups of people have least influence over local and national planning of climate change and disaster management. Greater attention should also be paid on public accountable monitoring system to understand how different groups of vulnerable people are provided assistance by national and international climate change policy and actions.



3. PROTECTING VULNERABLE PEOPLE'S ACCESS AND CONTROL OVER NATURAL RESOURCES.

Access and control over common natural resources has been the major safeguard for people to cope with the impact of natural disasters in the past. These resources are not only affected in terms of nature (through changes in bio-physical environment such as salinity or loss in bio-diversity) but also volume in terms of poor people's access through the process of commercialisation and privatisation. Retaining vulnerable people's access to and control over these resources must be adopted as key priority in the national climate change actions.

4. FOSTERING REGIONAL COOPERATION ON ADAPTATION.

The governments in the Bay of Bengal region and the member countries of SAARC must foster regional development and sharing of knowledge, lessons and technologies for adaptation to and mitigation of climate change. The civil society actors should also foster exchange of information and knowledge for effectiveness of their community level adaptation activities. Governments should also facilitate development of joint research and programme for adaptation and prevent development can increase people's vulnerability to climate change.

As a prologue to establish the engagements of the civil society and the government agencies, Concern Worldwide and Bangladesh Unnayan Parishad have jointly initiated a round table consultation on the COP processes. A micro-macro synergy has been organised strategically to feed into the forthcoming COP- 17 in Durban by voicing the key findings and action pointsthrough a transformative agenda.The initiative has been extended across the border to mobilise the CSOs from Bay of Bengal region. The abstract of the report was shared at the round table organised in Bhubaneswar on 2nd November and at the Dhaka Round Table on 12th of November to build a consensus amongst key stakeholders by sharing the baseline findings and facilitated a sub-regional dialogue as the stepping stone to engage with the multifaceted issue around Climate Change policy action framework. The negotiation team shared the specific position taken to advocate for fair position on climate change under the UNFCCC platform with civil society groups. On behalf of the Government of Bangladesh, Honourable Minister of Environment joined the deliberation as the chief guest and acknowledged efforts of civil society groups to include the climate issues faced by the communities living in the coast of Bay of Bengal.

“Paribartan Baseline Initiative in the Bay of Bengal region has also instituted a unique partnership with Action Research for Community Adaptation in Bangladesh (ARCAB) to enable empirical research and gain ground for an evidence based advocacy in the next five years (2011-2016)”.



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