

Mehdi AZAM¹ and Tapan SARKER²

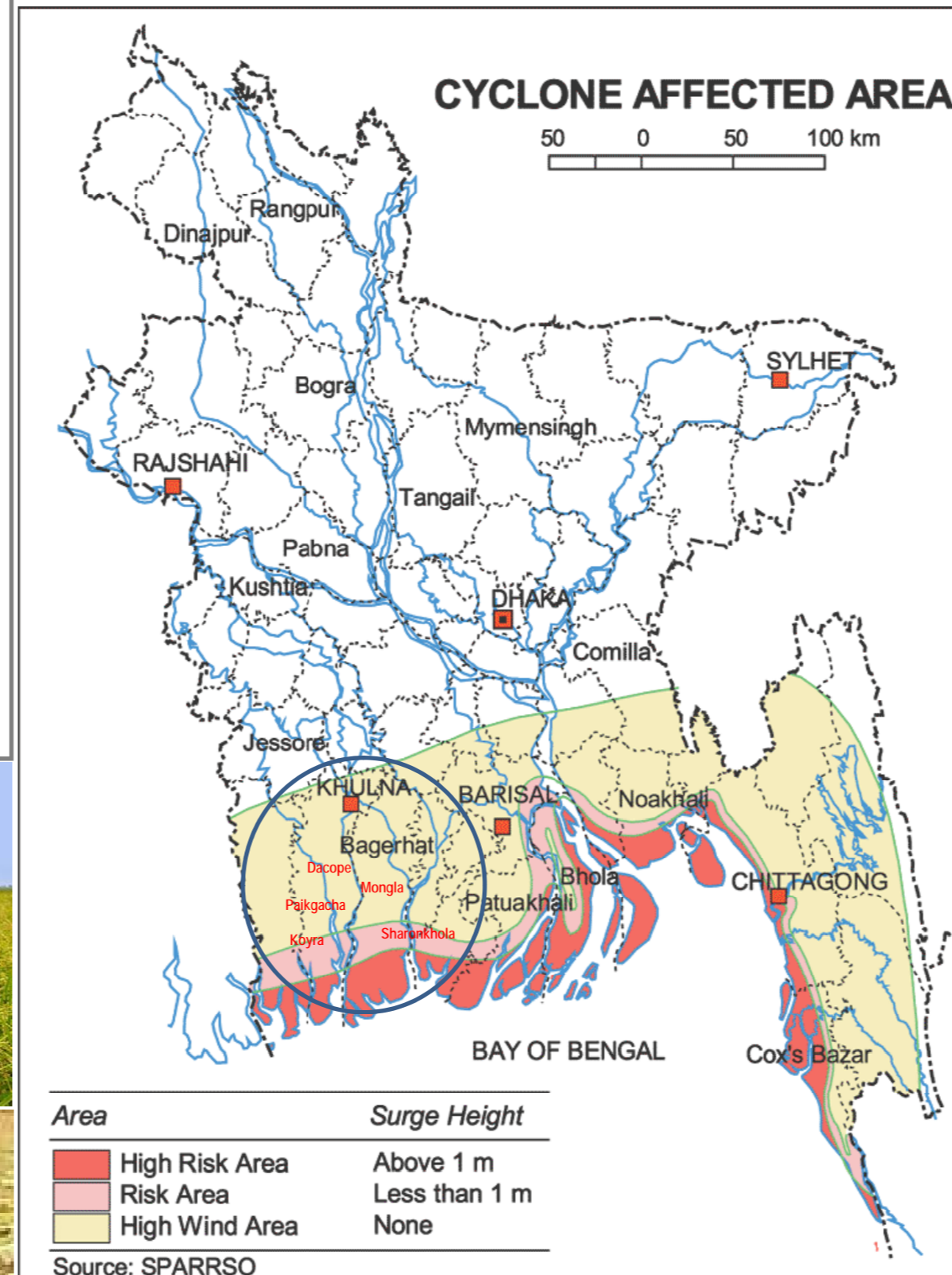
¹Environmental Governance Programme, University of Freiburg, Germany, E-mail: mehdi.azam@uranus.uni-freiburg.de; ²Asia Pacific Centre for Sustainable Enterprise, Griffith University, Australia, E-mail: tapan.sarker@griffith.edu.au.

Abstract

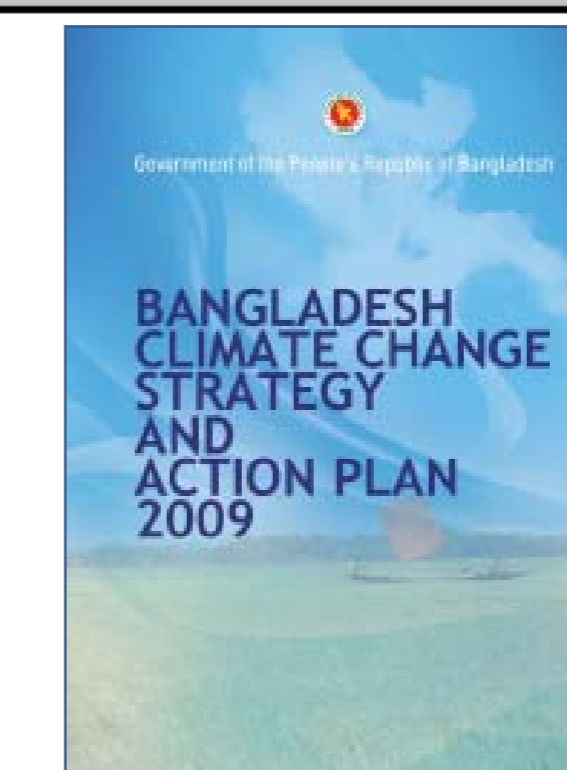
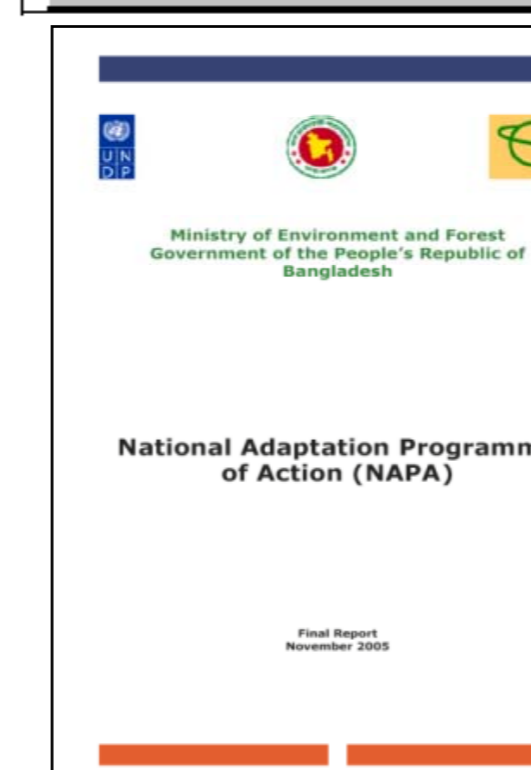
The impacts of climate change are particularly severe in Bangladesh due to its extreme poverty and economic dependency on climate-sensitive sectors like agriculture, food, and fisheries. Geographical location, frequent disasters, changes in precipitation and temperature, and man-made local environmental changes have dramatically reduced the stability of the coastal environment. This study investigates the impacts of climate change on the two most vulnerable coastal districts (Khulna and Bagerhat) of Bangladesh between 2008 and 2009 by analyzing recent and predicted changes to the coastal environment and livelihood patterns. In particular, it examines what climate change adaptation strategies have been adopted at the grass-roots level, with the aim of proposing improved strategies for mainstreaming climate change adaptation and mitigation in order to achieve climate-proof development and sustainability in Bangladesh. The study finds that the south-western coastal region of Bangladesh currently experiences livelihood and food insecurity as a result of the changing pattern of climate and human-induced activities in the natural environment. Current climate change adaptation initiatives are inadequate to secure the livelihood of the huge number of people affected by climate change. This ultimately means that people are being displaced to urban areas. The study concludes by suggesting a framework for development, involving multi-stakeholder engagement through less overlapping and more effective integrated actions between communities, civil society organizations, NGOs and various local government departments to build, at the grass roots level, a sustainable community that is resilient to the impacts of climate change.

3. STUDY AREA

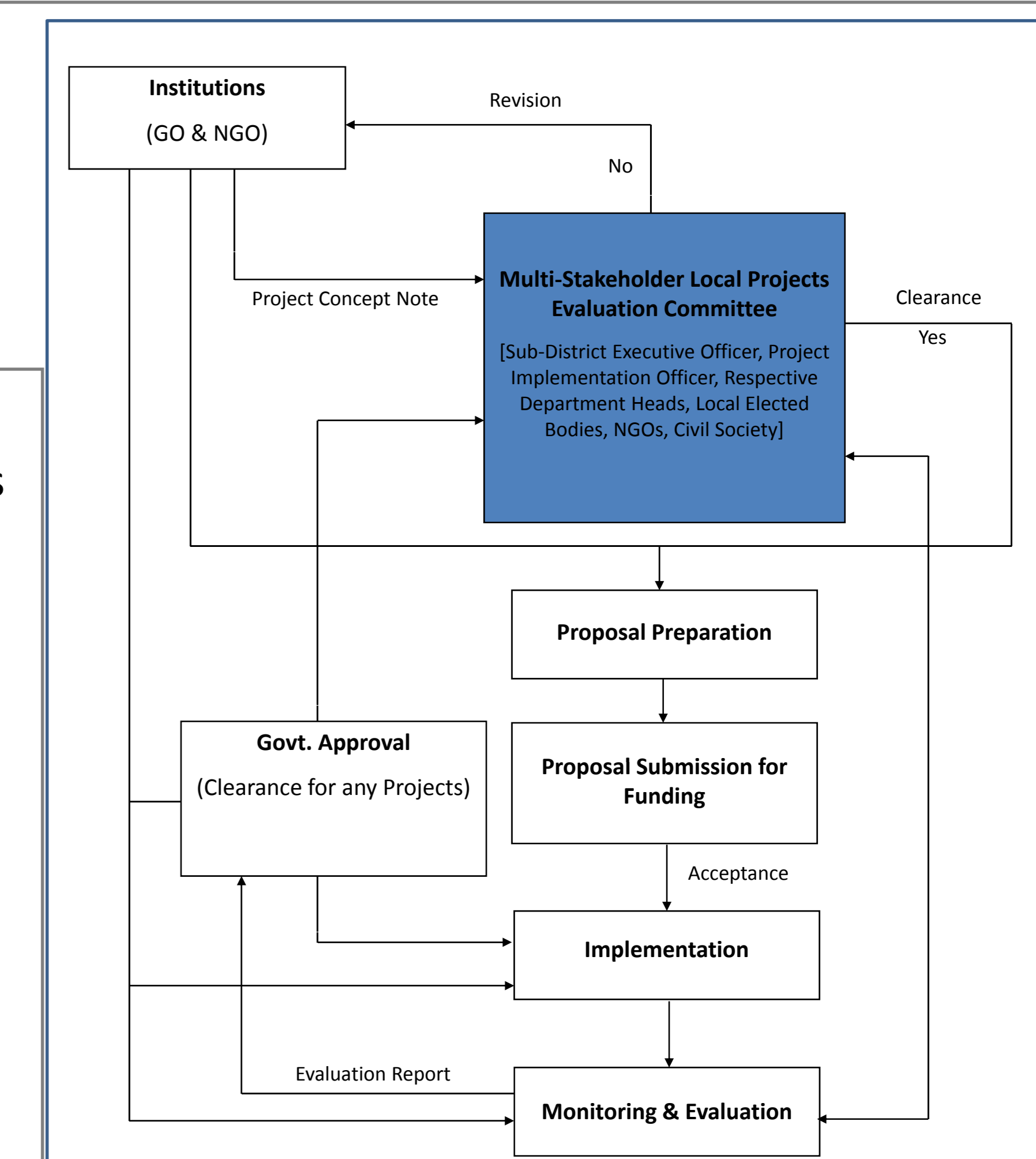
- S-W Coastal Region
- Special focus: Five sub-districts of Khulna and Bagerhat district
- Main Occupation: Agriculture farmer, fish farmer, day labour, the Sundarban forest dependent
- Zone of multiple vulnerabilities and opportunities



Strategies	Technologies	Implementation
(1) Community based management	Pond sand filter, large rain water reservoir and surface water treatment plant	Installed by Govt. or NGOs with a cost sharing approach. Operation and maintenance led by a community group and long-term monitoring by the implementing institutions.
(2) Community water enterprise	Pond sand filter, large rain water reservoir and surface water treatment plant	Group of community people have the full ownership of the water system as like social business enterprise development by the support Govt. institutions, Bank and NGOs. Operation and maintenance will run by selling water to people (adapted from Biswas & Merson, 2005).
(3) Household demand based management	Household rain water harvesting system and household filter (dual system)	Using loan/micro-credit household can buy their own dual technology for water supply to whole year. Availability of low-cost technology and financial institutions is very important.



9. MULTI-STAKEHOLDER GOVERNANCE FRAMEWORK



8. POLICY & INSTITUTIONS

- Mainstreaming of climate change risk has not integrated into development policies and strategies
- Policies are highly ambitious but implementation level is poor due to inadequate financing
- Zero grass-root involvement and decision-making power by local government institutions
- Ministerial coordination
- No specific action plan to address environmental/climate migrants

1. INTRODUCTION

- Climate change is recognized as a threat to environmental security and sustainability
- Coastal region's geographical location and vulnerability
- Failure of adaptation leads to migration
- Opportunities are high but weak governance structure
- This study aims to assess performance of existing adaptation strategies, impoverish sectoral adaptation and focus on further strategies prioritizing grass-root involvement for adaptation related project planning and implementation.
- The study also discusses the policy gap and current governance structures for successful adaptation

2. METHODOLOGY

- Field observation interview with local people
- Interviews with farmers, fisherman, local govt. official and NGO personnel
- Community consultation and FGDs
- Analysis of policies, institutional framework, project related documents and implementation strategies

4. RESULTS: VULNERABILITY

- LMFs and non farm households are increasing (54% are landless)
- Production hampered: natural disaster and increase of saline areas
- Agriculture sector: 21% of GDP and 50% of labour force (are dropping)
- Shrimp farming leads to environmental degradation
- Extreme food crises: mid July to Nov.; March to mid April
- Temporary migration (range 1 day to 6 months): multiple works
- Drinking water situation become worse and worse
- About 20-30 mil. environmental migrants with 1m SLR (landloss:17%)

5. RESULTS: CHALLENGES TOWARDS ADAPTATION

- Number of affected people get direct project benefit is negligible
- Rigid project criteria
- Limited allocation of budget for livelihood strategic solution
- Lack of integration between NGOs and Local Govt. initiatives
- More initiatives in the worse affected areas, thus neglecting medium or less affected areas: regional conflicts

6. SECTORAL ADAPTATION

- **Water Resources:** demand based technological incorporation to access safe drinking water, preservation and efficient strategies for water management in polders and drinking water supply (Table)
- **Coastal Protection:** technology and capacity improvement in building sea wall and incorporation of GIS-RS based planning for DRR
- **Livelihood:** diversification and dissemination of livelihood options to create an environment for multiple work opportunities at household level such as: floating agriculture/hydroponics, vegetable cultivation in marginal land, crab fattening, mat making, poultry, apiculture & honey processing
- **Health:** strengthening public health prevention strategies, sanitation improvement, replication of NGO initiatives at community level

10. CONCLUSIONS

- No other alternatives for Bangladesh except adaptation and strengthen the household resilience capacity
- Potential sectors need technologies & strategies, and its incorporation into the development processes
- Building institutional capacity for climate proof development initiatives is imperative
- Regional cooperation with neighboring countries
- Grass-root involvement is mandatory and empower local government institutions in terms of project planning and decision making power

ACKNOWLEDGEMENTS: The author(s) acknowledges the support of World Climate Research Programme (WCRP) for providing financial support and the floor to present the study results. The author(s) are also grateful to Prodipan (NGO, Bangladesh) for providing local support to carryout the study.

