

# Chapter 79

## Desert in Bengal Delta—Changes in Landscape, Changes in Livelihood: Can Diffusion and Adoption of Sustainable Adaptation Make a Difference?

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### ABSTRACT

*This study is aimed to assess the impacts of various climate induced events and the sustainability of adoption of coping and adaptive measures against these impacts. The study was conducted through participatory rural appraisal (PRA) and focus group discussion (FGD) in three sites of Kalapara Upazila (Sub-district), located along the Bay of Bengal in Southwest Bangladesh. Finding suggests that although flooding, cyclones, storm surges, and seasonal droughts have different attributes, they have commonality in bringing severe salinity in soil, sub-soil water, and surface water bodies that severely affects the livelihood security of natural resource-dependent coastal population. Indigenous knowledge and diffusion of vernacular technologies have helped a large majority of people to adopt various coping and adaptation strategies against the salinity problem for long. However, in a changing nature of salinity (i.e. a discrete isolated event has been turning to a perpetual event), which is resulting from climate change induced sea level rise (CC-SLR), most of their adopted coping and adaptation measures have failed to address their livelihood security on a sustained basis. To bolster their efforts toward adoption of adaptation strategies for sustainable livelihood, a range of avenues for interventions are identified.*

DOI: 10.4018/978-1-4666-4852-4.ch079

## **ORGANIZATIONAL BACKGROUND**

This research is aimed to explore the issues related to diffusion and adoption of adaptation strategies against the vulnerability of progressive intrusion of salinity which affects the sustainable livelihood of coastal inhabitants in Bangladesh. Salinity intrusion is largely governed by cyclonic and tidal surges, coastal flooding and climate change induced sea level rise (CC\_SLR). The issue of adoption of sustainable adaptation strategies by the inhabitants of coast-lying and small island countries (SICs) against the long term impacts of SLR induced events drew global attention for the first time when the third assessment report of the Intergovernmental Panel on Climate Change (IPCC) warned that humanity might experience almost a one meter (88 cm) SLR by the end of this century (IPCC, 2001). Such a massive scale SLR would increase both the frequency and intensity of SLR induced events, such as cyclonic storms, storm surges, tidal surges and salinity intrusion. All of these have the potential to amplify various impacts of salinization. These networks of impacts would ultimately jeopardize the livelihood security of millions of souls who have been living in the deltaic coasts and SICs unless they successfully adopt sustainable coping and adaptation strategies. Successful adoption of sustainable coping and adaptation strategies depends on how much people are aware of the existence and pace of diffusion of such technologies. Society's readiness to adopt such techniques and technologies as part of sustainable adaptation strategies is equally important (Olsson & Jerneck, 2010). Unfortunately, countries that would suffer the most from SLR induced salinity are the ones who are due to poor adaptive capacity in lack of well-defined network of diffusion of adaptation techniques and technologies. Bangladesh with a per capita income of US\$ 740 is a classic example of this duality, i.e. vary much prone to SLR induced salinity but paradoxically there exist very weak network for diffusion of techniques and technologies that relates

to adoption of sustainable adaptation strategies (GOB, 2008). This chapter makes an attempt, first to present the nature of livelihood vulnerability of coastal population given the likely scenarios of climate change and SLR. Second, how they have been adopting various adaptation strategies against their impacts of climatic disasters on their livelihood security is discussed in some details. How they are planning to adopt new techniques and technologies as part of sustainable adaptation strategies is also presented. Finally, the barrier to adoption and diffusion of such sustainable adaptation techniques and technologies are identified to make policy recommendation.

### **Bangladesh: A Story of Desert in Delta and the Research Agenda**

Bangladesh having a population over 140 million within a territory of approximately 144 thousand square kilometer (56 thousand sq. miles) is one of the most densely populated countries of the world (BBS, 2011). The economy of Bangladesh is largely agrarian; almost 75 percent of the population depend on agriculture and allied activities for their livelihood. Although per capita income is about US\$ 740, yet about 40 percent population live below US\$ 2/day poverty line. This South-Asian country is surrounded by India from three sides and flanked by the exposed coast of Bay of Bengal on the South. Bangladesh with a vast tract of exposed coast is one of the few countries in the Asia Pacific region most prone to progressive threat to SLR induced salinity (Figure 1). Its coastal region covers an estimated area of 36,000 sq. km (14, 000 sq. miles) (Ali Khan et al., 2000). Some 700 km (435 miles) coastline is extended from the East to West (Singh, 2001). The country has 19 coastal districts in three distinct coastal sub-regions. These three sub-regions are western, central, and eastern coastal zones. Historically the South-western part which includes the world-heritage tidal mangrove forest *Sunderbans* is most prone to multiple disastrous events due

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