

Strategies for Adaptation to Climate Change with focus on Water Sector

by

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Methodology

- ✚ Local level consultations and perception studies
- ✚ National Consultations
- ✚ Institutional implications
- ✚ Policy implications
- ✚ Study on past extreme events
- ✚ Flood hydrographs
- ✚ Urban flooding
- ✚ Traditional knowledge and coping strategies
- ✚ Sectoral reviews : agriculture, forests, fisheries, flora, fauna, health, disaster management, coastal zone management, livelihood,

Climate Change Scenarios for Bangladesh

Year	Temp fluctuation		Rainfall	
Increase	oC		compared to 1990 %	
Monsoon	Dry season		Monsoon	Dry Season
2030	+0.7	+1.3	+11%	-3%
2050	+1.1	+1.8	+28%	-37%

Vulnerability and Impacts

Major impacts will be through

- ⊕ Floods

- ⊕ urban flood,

- ⊕ flash flood, and

- ⊕ river flood,

- ⊕ droughts,

- ⊕ cyclones and storm surges,

- ⊕ sea level rise and inland intrusion of the coast line, increase in salinity,

- ⊕ Existing vulnerabilities will be amplified,

Vulnerability and Impacts(*contd...*)

- Main river flooding may increase in duration.
- A sea level rise of 0.5m by 2050 would exacerbate drainage congestion.
- Flash flooding will be more frequent.
- Frequency of tropical cyclones in the coastal belt will increase.
- Accretion of new coastal lands may be slower.

Vulnerability and Impacts(*contd...*)

- In broad terms evaporation to precipitation ratios are expected to rise progressively.
- This would require an increase in irrigation water requirements unless offset by diversification towards dry-foot crops.
- Groundwater resources may be little affected, but dry season trans-boundary flows will reduce.

Potential impact of sea-level rise on Bangladesh



Today

Total population: 112 Million

Total land area: 134,000 km²



1.5 m - Impact

Total population affected: 17 Million (15%)

Total land area affected: 22,000 km² (16%)

Some information on Bangladesh

- The economy of the country is strongly dependent on the agriculture sector.
- The country strives for self- sufficiency in food.
- In recent years, Bangladesh has been self-sufficient in food-grain production.
- Cropping pattern is dependent on climatic parameters. Water management and agriculture is closely inter-linked.
- Population density: about 1000 persons per sq.km. Population growth rate: still very high (about 1.5%).

Information on Bangladesh (contd..)

- Bangladesh is a flat deltaic land.
- Long coast line (710 km.) with low lying coastal flood plain vulnerable to inundation by storm surges.
- Ganges- Brahmaputra-Meghna system carries huge monsoon flow; 92% of total runoff is generated outside its political borders.

Local Level Perceptions

- ✘ Local people are already experiencing effects of climate variability.
- ✘ Identified many irregularities: timing of floods (flash floods, and both early and late monsoon flood) and drought like situation, changes in seasons, increase in river bank erosion, increase in max. as well as min. temperatures, prolonged fogs, big hails, frequency in cyclonic weathers increased etc.
- ✘ Planning to take actions to cope with and adapt to climate variability.

Local Level Consultations

Local consultations recommended:

- ★ Recognise traditional coping and adaptation mechanisms;
- ★ Institutional mechanisms to mainstream traditional coping and adaptation mechanisms;
- ★ Document traditional coping and adaptation mechanisms;
- ★ Create mass awareness about climate variability
- ★ Increase surface water storage and restore natural water courses;

Some findings from sectoral reviews

- ▶ Affects everyone, but the poor first and hardest;
- ▶ Intensity and frequency of urban flooding likely to increase and Dhaka is likely to be seriously affected due to drainage congestion.
- ▶ Problems related to availability of fresh water for drinking and sanitation will be acute
- ▶ All existing flood embankments may be overtopped during high floods in future as 10% increase in rainfall in Assam will result in 20% increase in flood level.
- ▶ Vector borne diseases are likely to increase.

Some findings from sectoral reviews

- ★ climate change will bring adverse impacts on the breeding characteristics of fish, both inland and marine, and also on wildlife.
- ★ Changes in flowering characteristics will have impacts on migratory species.
- ★ Change in salinity level will adversely affect the Sundarban.
- ★ Land formation process in the coastal belt will be hampered.

Some findings from sectoral reviews

- ★ Coastal livelihoods dependent on resources such as fisheries and mangroves that will be severely affected;
- ★ Rural infrastructures have already created problems in flood flows.
- ★ In earlier days societal mechanism took charge in management of natural disasters at local level; then the state took over this task; the society is now being asked to take back the responsibility;

Towards a Strategy for Bangladesh

- Starting point – review of existing sectoral policies and institutional set up, and recommend appropriate changes and additions;
- Inter-sectoral links between water, agriculture, environment, disaster management, coastal zone management;

Elements of a Strategy

- ▶ Knowledge management
- ▶ Strategic and spatial planning
- ▶ Strategic investments in infrastructure
- ▶ Disaster management – preparedness first, relief and rehabilitation later

Elements of a Strategy

- ☑ Alternative crops, livelihoods, attention to water management
- ☑ Capacity creation - decentralised and local levels
- ☑ Awareness raising, advocacy and education

The Way Forward

- Assess local coping & adaptation strategies
- Define indicators and benchmarks of change
- Integrate climate variability into water policies, ICZM, other sectoral policies and programmes
- Regional and international cooperation
- Identify vulnerable areas, hot spots, and monitoring of impacts
- capacity building and awareness raising
- Concerns related to climate change and climate variability to be incorporated in project planning process.