Bangladesh: Water Resources Senerios and Climate Change Impact and Adaptation Programs

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Bangladesh is one of the most climate vulnerable countries in the world due to its geographic location on globe.
Geographic Locations of Bangladesh in Regional Context

Bangladesh
Geographical location of Bangladesh and Catchments of GBM

- **Ganges Basin**: Area of G. Basin 10,87,300 Km²
- **Brahmaputra Basin**: Area of B. Basin 5,52,000 Km²
- **Meghna Basin**: Area of M. Basin 82,000 Km²

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Map showing geographical locations and catchments of GBM with the names of geographical locations and areas.
Most Vulnerable Coastal Zone of Bangladesh
Most Vulnerable Coastal Zone of Bangladesh

- About 80% of the catchment area is outside the international boundary.
- Most of the rainfall occurs during monsoon. Hence monsoon flooding here in Bangladesh is a common phenomenon.
- The rivers of Bangladesh drain run-off of upstream catchments of area about 1.7 Million square km.
- About 37% of Bangladesh lies in the Coastal zone out of which 62% are has an elevation up to 3 m and 80% area has elevation upto 5 m above mean sea level.
- The combined effect of monsoon flooding and climate change-induced sea level rise make the Coastal Zone highly vulnerable to climate change.
Water resources challenges in Bangladesh

- Population booming: a population of 160 million in a country of only about 150,000 sq.km is expected to rise to 181 million by 2025 and 224 million by 2050.

- Rapid urbanization and industrialization: which leads to put additional pressure on agricultural and wetland utilization.

- Changing pattern of natural disasters: such as rainfall pattern, flooding, drought, river bank erosion, drainage congestion, tidal and cyclonic surges and so on.

- Decrease of upland flow: upstream diversion induces sedimentation in the river bed that leads to river dying and loss of river functionality in Bangladesh.

- Arsenic contamination in the groundwater.

- Pollution of river water: is a threat to health and hygiene of the people.

- Shift of saline and fresh water meeting line towards the country due to decreasing freshwater flow which will be aggravated due to climate change–induced sea level rise.
Impacts of Climate Change in Coastal Landscape

- About 60% of the worldwide deaths caused by tropical cyclones in the last 20 years in Bangladesh.
- Southwest Region and Southern area will experience severe water logging problems by climate change induced Sea Level Rise and increase of Precipitation
- Damaging of infrastructures of Rural landscape including water supply and sanitation systems in the coastal region
- Stressed water quality and availability
Impacts of Climate Change on some physical processes

- Damage of Coastal Embankment
Inundation due to storm surge After Cyclone Aila at ShamNagar
PROBLEMS OF COASTAL POLDER

- Drainage congestion
- Degradation of environmental and Socio-economic
Embankment near overtopping
Climate Change Adaptation Strategy of Bangladesh

- 2001 National Water Management Plan
- 2004 Climate Change Cell
- 2005 National Adaptation Program of Action
- 2008 and 2009 Bangladesh Climate Change Strategy and Action Plan

Integrated Focus on Climate Change Adaptation
Flood Management schemes to raise the agricultural productivity of low-lying areas
Flood protection and drainage schemes to protect urban areas
Coastal Embankment Project to raise agricultural productivity in coastal areas by preventing tidal flooding and salinity intrusion
Construction of Cyclone Shelter for affected communities from tidal surge
Comprehensive disaster management projects involving community-based programmes and early warning systems for floods and cyclones
Irrigation schemes to enable farmers to grow crops in the areas subjected to heavy monsoon flooding as well as in the drought-prone areas
Agricultural research programmes to develop saline, drought and flood-adapted high-yielding varieties of rice and other crops
Coastal “Green Belt” project involving mangrove planting along the shoreline
To adapt the water in the changing climate, coordination among all government and non-government organization is imperative. As climate change is a cross-cutting issue, a coordinated institutional response should be based on integrated planning with community participation including NGO and Civil societies at different levels. They are already actively involved in the awareness building program for the anticipated climate hazards and potential adaptation measures among the affected people.
Bangladesh faces unique challenges – abundance in water during monsoon and scarcity of water during dry season. The country's vulnerability is further increased by the fact that 92% of its surface waters originate from the outside of its border. Sharing trans-boundary river water is a complex issue. Two decades back, Bangladesh succeeded to enter into a long-term water sharing arrangement with India on the Ganges waters.

Presently Bangladesh has been receiving flood related data and information of the major Transboundary rivers from India, China and Nepal which are successfully using in the non-structural adaptation approach to climate change such as flood forecasting and early warning system of Bangladesh.
Conclusion

➢ Funds for implementation of the adaptation programs have to be collected from developed nations, because the need has been arisen due to historical emission of greenhouse gases (GHGs) by the industrialized countries. The Government of Bangladesh is trying to raise the voice through LDC and G-77 countries to get the purely grant based fund from donor agencies.

➢ Being the lowermost riparian country of the three mighty Himalayan rivers (GBM), the implementation and sustainability of Adaption action plan largely depends on the transboundary cooperation with the upper riparian countries.

➢ The Government of Bangladesh and India have signed a "Framework Agreement on Cooperation for Development" in September 2011. Both side have inter-alia agreed to enhance cooperation in sharing of the waters of common rivers and explore the possibilities of common basin management of common rivers for mutual benefit. This has opened the opportunities towards establishment of joint bodies for IWRM at River Basin Level.

➢ Bangladesh believes that the regional and transboundary cooperation manly depends on strong political will, mutual trust and change of mind set among the riparian countries are a pre-requisite.