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DELTA PLAN 2100

Climate change adaptation in coastal zone

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The honourable Prime Minister Sheikh Hasina mentioned that "Bangladesh Delta Plan (BDP) 2100 is the plan moving Bangladesh forward for next 100 years. The government approved long term 'Delta Plan 2100' to secure water resources, as well to integrate climate change adaptation, engineering and food security. Of the six hot spots- 'Coastal zone' is a major one- covering 27,738 sq. km in Southern coastal belts of 19 districts.

Bangladesh is a deltaic country. The combined flow of the Jamuna, the Padma and the Meghna merged at Chandpur- to form a spectacular river flow - then down to the Bay of Bengal. The coastal belt is covered by net-work of numerous rivers, tributaries and cannels- which are branches and sub-branches of 3 major rivers.

At present, effects of global warming are much echoed in coastal belt. The adverse effects are: increase of cyclone and storm surge, sea level rise and more saline water intrusion. One meter rise of sea level could eventually inundate about 10% areas of the country in coastal areas. The people in Satkhira-Khulna-Bagerhat and Barisal-Brguna will fall in great constraints.

Pre and post monsoon cyclones are dominant. Devastating cyclones are causing greater destruction of crops and carrying saline water. Increase of salinity level is a threat to many existing winter crops- there is a lack of fresh irrigation water and about 1 million hectares of land remain fallow due to high salinity during dry season. In wet season, maximum surge height is more than before- make it difficult for surviving semi-dwarf Aman rice in tidal areas.

In wet season, high tides and over silted coastal rivers accelerate extensive mixed floods and crop loss. The people are facing problems with fresh drinking water, crop yield reduction, as well dry season shortage of cattle feed. Previous attempt to control tidal flood and salinity haven't been largely succeeded. Delta Plan 2100 should give us guide lines, such as, how to manage tidal flood and how to preserve fresh river water for controlling dry season salinity.

Basic research is needed to generate knowledge on hydrology, and flow of major rivers in 3 coastal zones: south-west region, central zone and south-east. In deeply inundated saline south-west zone- extension of protective mangrove forest may be feasible for protection of cyclonic hit. In central non-saline coastal belt of Barisal- full tide control may be feasible using dike/embankment. New lands reclamation is fusible in south-east zone, as Meghna estuaries have over siltation and land mass/char lands.

In three coastal zones - extend of cyclones, flood, and salinity, tidal submergence is not same. Separate hydrodynamic modelling (data on tide, flow and depth) in rivers of 3 zones and adjacent flood plains (depth, duration) could be conducted for finding best tidal flood and salinity protection option at different zones. Then, one mega project "coastal protection and sweet water conservation could be developed- integrating many activities, such as rivers dredging, coastal dyking and poldering, drainage, irrigation and de-stalinization.

This mega project could be implemented by some inter-linked sub-projects: 1. Dredging all coastal rivers 2.Constructing dikes/roads and protecting entire sea sites from erosion from central region to Cox's Bazer, 3.Polders with drainage, irrigation net work and de-stalinization, 4. Natural land reclamation by dam or by reusing dredging materials in the Meghna estuaries of Noakhali and 5. Sea side constriction of fresh water reservoirs, 6. Mangrove forestation in south-west region.

Dredging and silt removal of all coastal rivers is most important. There are many types of dredging - the dredged material is sucked up by a centrifugal pump of a dredger; the slurry of dredging with water is pumped straight into pipes which are deposited on nearby land. A relatively long consolidation time is required to obtain usable new land/soil-mass. Thus, we could create new land in sea side areas and could increase water holding capacity of rivers.

Research is needed on different issues, such as, how to use dredged materials for constructing dike (embankment) and land reclamation from sea. Sea site dikes and new lands are built by transporting dredging mud, sand and clay from the nearby shallow sea beds to other areas. Land reclamation is a process of creating new land from oceans.

The present coastal embankments have less effective lives in the face of cyclone hit. A dike or a sea-wall on coastal lines could be designed to provide high level of protection from cyclone. Dikes made with a core of sand- covered by a thick layer of clay provide resistance against erosion. Research could be done on current dike structure made up of earth with placing stones on the sea side for enhancing its life.

A dike is constructed to the site of sea; a dam runs across body of sea/river water. A dike has water only in one side; a dam has water in both sides. The main purpose of a dike is protecting the land from tidal flooding, whereas a dams' purpose is to retain/conserve the water in coastal areas. The basic research is needed on "tide and cyclone hit protection" and on "fusibility of different flood protection measures (dike or dam).

Dam is a barrier of concrete or earth that is constructed across a river or sea site to obstruct the flow of sea water, especially in order to create a fresh water reservoir used as an irrigation water supply. A dam is a compacted wall of soil, sand, clay and rock- placing rocks on the upstream and downstream sides. A gravity dam is usually made of concrete.

The coastal reservoir is separated from the sea by building a surrounding dam in sea site. Then, saline water is drained out from reservoir and fresh river water is placed. Reservoir created by dams could provide freshwater for salinity mitigation and navigability. Research and fusibility studies are needed on sea site dams/reservoir construction for holding enough fresh water for irrigation.

The 'Delta Plan 2100' could improve tidal flood management systems and could ensure sufficient dry season flow of coastal rivers. Cyclone risk, saline intrusion and crop loss will be minimized. In wet season, modern Aman rice based farming system with shrimp culture could be implemented, where local Aman varieties are still grown. Development of tall Aman variety having 190 cm height (as like BRRI dhan91) and more salt tolerant Boro rice varieties might be emphasized for coastal areas.

'Delta Plan 2100' with a Coastal Development Board might open the door of river dredging and tide/cyclone protection. A group of talented engineers of BWDB could work in Coastal Development Board. Coastal sites having tide and saline free conditions will expend income generating activities. Emphasizing multipurpose use of lands, export oriented cash crop, modern rice and shrimp cultivation is important. With different climate change adaptation under 'Delta Plan 2100'- economic condition of coastal people might be improved.

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