

Policy Brief: Improving adaptation capacity of communities to face the climate-induced challenges in water management: The way forward

Inputs from Bangladesh Water Partnership (BWP)

On behalf of Bangladesh Water Partnership (BWP) we would appreciate the APAN Policy Brief to Chart out a Road Map and lay down different recipes for adaptations to combat or successfully face the impact of climate change in the different spheres of national life and different aspects of the Agro-socio Economic and livelihood sectors. The primary objective of the policy should be to help steer things in each country to protect the existing live and living as well as agro - socio economic practices so that the life pattern is not grossly disturbed. Each country of the region has already moved ahead with their own innovated different adaptation practices. The promising and prospective adaptation measures can be appropriately show-cased in the policy brief with their positive impacts as well as the challenges faced in the different geographical regions. We are sure, that like BWP, other CWPs have also given ample details of their adaptation measures and techniques in their earlier write-ups, which some other country might find interesting and would like to consider.

It does not commend serious wisdom or much of analysis to comprehend that it would not be singularly possible for some of the South Asian countries to combat the onslaught and impacts of the climate change for which they are little responsible. To cite an example –

Bangladesh has no responsibility at all to climate change, but it is one of the most vulnerable countries, being at the forefront of threats of increasing sea level rise, salinity ingress, storm surges, cyclones, floods, loss of habitat, destabilization of agriculture etc. Without international support for countering the effects of climate change, largely through adaptation actions, Bangladesh is not in a position to fight it alone. Regional support in terms of co-operative basin wide management of the international river water resources traversing through this country is totally absent. Despite utmost efforts for last several decades by Bangladesh for such cooperation, virtually nothing has materialized. The cooperation amongst the South-Asian regional countries for preparation and dissemination of meaningful flood and drought forecasting in the Ganges, Brahmaputra, Meghna river basin areas to save the life and living of millions of downtrodden people still remains a far cry. All efforts of Bangladesh to conclude long-term water sharing treaties on all 54 common/transboundary rivers with India over the decades are going in vain. This is the gaping and glaring gap.

On climate change, Bangladesh has prepared several planning documents, the latest being the 'Bangladesh Climate Change Strategy and Action Plan' (BCCSAP). The BCCSAP is now reflected broadly in the country's Sixth Five Years Plan (2011-16). Agriculture Ministry is a beneficiary of the disbursements from the GoB's Bangladesh Climate Change Trust Fund (BCCTF), which is being used mainly for adaptation programs.

Bangladesh remains highly proactive in facing the adversities of Climate Change. It is one of the first countries to develop a Nationally Appropriate Plan of Action (NAPA) in 2005 for addressing climate change through a Consultative process among GOs, NGOs, Civil society, academia, professional bodies, private sector, research organizations, think tanks and development partners. The NAPA was updated in 2009. And, as the first country in the world, Bangladesh has adopted a Bangladesh Climate Change Strategy and Action Plan (BCC SAP) in July 2009. It is built around six broad thematic areas or pillars: (i) food security, social protection and health, (ii) comprehensive disaster management, (iii) infrastructures, (iv) research and knowledge management, (v) mitigation and low carbon development, and (vi) capacity building and institutional strengthening. The BCCSAP includes 44 listed programs of action.

The following subsections provide glimpses of some of the different scientific innovations pursued in Bangladesh in the field of adaptation techniques to tackle impacts of climate change.

Flood forecasting and warning

Bangladesh recognizing the fact that the climate change would induce more severe floods, droughts, cyclones more frequently has been making all out efforts to improve its Flood Forecasting and Warning system as well as cyclone warning system. In terms of giving advance warning on floods, Bangladesh Water Development Board (BWDB) with the application of more modern techniques is frantically trying to decrease the lead time of warning from 72 hours to 24 hours for the major river floods, and at least 6 hours for the flash flood prone areas. This endeavor would come to fruition if only the upper riparian country/countries extend meaningful assistance by providing real time rainfall and river water level data of the upstream hydrometric stations on the trans boundary rivers.

Bangladesh all alone can do no further in this matter without the active support of the upper riparian countries particularly India. But inside the country efforts are underway to improve the dissemination techniques to make the warnings reach more people more early, in languages which can be easily comprehended.

Drought Forecasting:

Bangladesh has no mechanism of drought forecasting in place. Relevant research organizations are trying to evolve appropriate drought forecasting systems in the country but in this case too, the active assistance of the upper riparian countries will be an essential prerequisite.

Infrastructures:

All the communication, housing and settlement and water sector infrastructures are now being designed and implemented under the flood proofing concept so that they are not inundated by increased flood heights. The plinth levels of dwelling houses are being raised gradually. The roads, rail-way tracks are being further raised to put them above the inundation depths. The heights of old flood protection embankments as well as sea dykes and appurtenant structures are being gradually but slowly raised. But paucity of funds is a major constraint in this respect.

All dwelling houses are going to be progressively equipped with rain water harvesting systems. More small scale water conservation undertakings are also in the offing. The relevant departments like BWDB, Roads and Railway Departments as well as the Housing sector are making sure that the designs of all their future projects cater to the changed circumstances to be forced by climate change. Some of these projects are being funded by the climate change trust fund as well as climate change resilience fund. River erosion control projects of BWDB are being designed to be more robust and effective.

In order to effectively deal with the climate change impacts BWDB's char development and settlement project would play an important role. The Estuary Development Project of this Board would not only offset the negative impacts of sea level rise but shall also help accrete more new land along the Coast in the south. 18 scientifically designed cross-dams would be undertaken at the initial stage under this project. Water Resources Planning Organization (WARPO) is going to update and revise the National Water Management Plan to face the impacts of Climate Change. BWDB has also embarked upon an ambitious program of Capital Dredging in the main rivers as well as some other important medium rivers to improve the drainage system of the country.

Agricultural Practices

a) Irrigation Management:

The continued trend of more frequent and intense droughts and variations in rainfall due to climate change are having significant impacts on agriculture. So people and the relevant departments are encouraging more and more innovative techniques to facilitate round the year irrigation. Traditional practices such as pond excavation, retention of rainwater in mini pond or in 12'×12'×3' size pit at any corner of the land is providing supplemental irrigation in many places. Private and government supported shallow and deep tubewells are also facilitating irrigation with subsidy in fuel and electricity. Rubber dams are being implemented in increasing numbers in some small rivers for supplying irrigation water. Farmers are practicing moisture conservation through 'mulching' by straw, water hyacinth, rice husk, polythene etc. Some are following AWD (Alternate Wetting and Drying) method for rice cultivation. Alternative adaptation practices such as multiple cropping systems and homestead gardening etc. are also been encouraged.

b) Fertilizer Management:

Climate change is inducing change in the country's fertilizer management. Increase of atmospheric carbon dioxide reduces the nitrogen uptake by plants or crops. To cope with the situation use of USG (Urea Super Granule) in wetland rice cultivation is a popular method now. Use of organic matter or organic manure is being popularized to increase water holding capacity of the soil.

c) Appropriate Crop/Variety selection:

Cultivation of existing crops may not be possible following current cropping patterns due to the environmental changes induced by climate change. So the relevant research organizations of the Ministry of Agricultural are innovating and evolving different rice varieties like the following,

- Drought Tolerant: For rice crops Bangladesh Rice Research Institute (BRRI) dhan 42, BRRI dhan 43 and early maturity BRRI dhan 33, BRRI dhan 39. For acute drought prone areas the variety is BINA dhan-7. The newly innovated hybrid Boro paddy (dhan) BRRI Hybrid Dhan-3 with shorter life time and lower production cost is going to be released soon. Farmers are adopting some innovative practices (viz. zero tillage, priming of seeds during sowing, mulching, relay cropping, dry seeding etc.) in the drought prone areas.
- Saline Tolerant: Bangladesh Institute of Nuclear Agriculture Research (BINA) has released two salt tolerant 'Aman' rice varieties (BINA-8, BINA-9). Besides, BINA Tomato-6 will also be a salt tolerant tomato seed variety. BRRI has already released salt tolerant rice variety (Bridhan 47) for the coastal region. Farmers are adopting some innovative practices like 'Floating bed agriculture in many flood prone and salinity / tidal surge areas. Salt tolerant spices like chilli, groundnut, methi, water melon, cucumber are being encouraged to be cultivated in saline zones.
- Flood Tolerant: BRRI has released two flood tolerant varieties (BRRI dhan-51, BRRI dhan-46) can be cultivated just after the flood water recedes till mid-October. Submergence tolerant rice BR-11-sub-1 has been released. The newly innovated hybrid 'Boro' paddy-BRRI Hybrid dhan-3 with shorter lifetime and lower production cost is expected to be released very soon.

Floating vegetable cultivation on water hyacinth mass (heap) is also being practiced in low lying areas which for major part of the year remain submerged.

The challenges faced by Bangladesh are many: to give a few examples -

- i) Soil degradation is posing a serious problem in Bangladesh. Estimates by Bangladesh Agricultural Research Council (BARC) of 2000 indicate that soil related problems may

become a major constraint to agricultural growth. Organic matter depletion is observed in 7.5 million hectares of land. Declining soil fertility, soil erosion and salinisation affect respectively 5.6-8.7 million hectares, 5.3 million hectares and 3.05 million hectares of land. It is estimated that Bangladesh soil loses annually some 2 million metric tons of nutrients. Unless compensated through balanced application of nutrients every year the fertility of land is going to decline and so will its productivity. As per one estimate, about one percent of crop GDP will be lost every year. Sustainable land management (efforts for which is ongoing now) is therefore, a major challenge for now and also in the future.

- ii) Due to withdrawal of dry season Ganges flows by India, large swathes of land in the Ganges basin in Bangladesh has become desertified where it used to be lush green before. The land has become unfit for agriculture and the rivers have turned into narrow drains with innumerable large-small shoals and inlets cropping up in the flow path of the rivers.
- iii) Unplanned land use in setting-up of development projects, private, industrial and service activities, human settlements, grabbing of wetlands and other common resources by unscrupulous persons and unplanned rapid urbanization is a major problem facing the country. The country is also losing on an average close to 1% of agricultural land per annum to other uses. More agricultural land will be lost in future due to increased salinity ingress and river erosion as a consequence of climate change. This is a serious concern relating to food security in future. Bangladesh needs to rethink its priorities relating to sustainable use of land as it approaches 2050 when the population is expected to be more than 300 million from the present 150 million.

As for constraints, the absence of communication network amongst the South-Asian countries for free flow of all types of climate change related data and paucity of adequate funds minimally required to implement the adaptation measures are the two major constraints amongst many others. Bangladesh is seeking to combat climate change impact with its own meager resources to the feasible extent. But the funds this country can afford for this purpose are too little compared to the huge needs. Bangladesh, therefore, has been reiterating that all financial support from the global community provided for climate change management activities must be new and additional to the official Development Assistance (ODA). It must be over and above the normal ODA for Bangladesh. Least Developed countries including Bangladesh are now facing a scenario of declining ODA. This scenario needs to change and the developed countries should abide by their own commitment to sustainable and equitable development world-wide.