

Grass-Root Level Field Experience in Water Management¹

by Dr. Shamsul Alam

For the national development that can be achieved through proper disaster management, real environmental stability, usage of arable lands, integrated water management, it is vital to consider the climate change perspective. The coastal region of Bangladesh faces the most adverse effects of climate change. In the Bangladesh Delta Plan 2100, the severe vulnerability of the coastal area is mentioned with importance. A Finance department team of Bangladesh Planning Commission went to Dumuria and Botiaghata Upazilla of Khulna and Satkhira Sadar Upazilla. The purpose of the visit was to observe Blue Gold Program activities and discuss with the concerned stakeholders about the problems' farmers are facing in the field.

Before starting discussion on Blue Gold Program, it is necessary to mention some points on the risk of climate change especially about increase in temperature, rainfall, effect of increase in sea level and also about the strategies and major activities for the coastal areas specified in the Bangladesh Delta Plan.

Bangladesh is one of the disaster-prone countries due to its geographical location, risk of climate change and being a delta land. According to the Intergovernmental Panel on Climate Change (IPCC-5), Bangladesh is one of the top ten disaster prone countries in the world. Cyclone, storm, tornadoes, drought, flood, riverbank erosion are the common problems in our country. Due to rapid unplanned urbanization, rural development and industrial development without considering the necessary environmental protection measures, the pressure on the environment and environment is increasing. Dealing with climate change risks, natural disasters and maintaining sustainable development trends in the country are the major challenges at the moment. Bangladesh Delta Plan 2100 has been taken into account for long-term development of the country considering the factors water resource management, climate change and environmental challenges.

Bangladesh Delta Plan 2100 is a techno-economic, holistic and long-term strategic integrated plan. This plan specifically addresses the climate change and its detrimental effect. Moreover, water supply and environment related targets have been further timely specified in this plan.

In the last five decades, the average temperature of Dhaka City has increased by 1.1 degree Celsius and average annual rainfall decreased by half. In 1971, the annual average temperature of Dhaka City was 25.6 degree Celsius that increased to 26.7 degree Celsius in 2016. That means in the last 45 years, the average temperature of Dhaka City has increased by 1.1 degree Celsius. On the other hand in 1971, the average annual rainfall was 640 millimeter which decreased to 370 millimeter in 2016. Global temperature has already reached 1°C above pre-industrial era. 2018 was one of the warmest years on global record. This clearly gives an evident of the impact of the climate change. Moreover, the sea level has increased by four millimeter in the coastal areas of Bangladesh in the last two decades. If the temperature continues to increase in this rate, then our 19 coastal districts will become submerged as a result of increase in sea level. It is predicted that by 2030, 14 percent area of the country will become

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extremely vulnerable to floods, and cyclone scale might go up by 5 to 10 percent. As a result of this, most of the sectors of the country will be affected and the overall economy will suffer.

Now comes the implementation of Blue Gold Program. Blue Gold Program is implemented by Water Development Board and Department of Agricultural Extension that mainly aims to increase agricultural production and to create a sustainable socio-economic development in the selected polders of Khulna, Satkhira, Barguna and Patuakhali district through proper water management. Blue Gold Program works in total 22 polders covering an area of 115,000 hectares. This program is being implemented with financial support from the Government of Bangladesh and the Government of the Netherlands.

Blue Gold Program works for the water management infrastructure like embankment repairing, sluice gate construction and repairing, inlet and outlet construction and repairing, re-excavation of khal to remove waterlogging resulting in more agricultural production and increased income of local people.

Another main objective of Blue Gold Program is to establish water management organizations (WMOs) consisting the members of the polder area. The purpose is to form WMOs by involving the local people so that they can cultivate more during the dry season and increase their income through regular operation and maintenance of sluice gates and crop diversification through participatory water management.

Water Management Association (WMA) and Water Management Group (WMG) are formed depending on the administrative catchment/sub catchment boundary of the village, type of water flow and drainage system in the polder area. Both Water Management Associations (WMA) and Water Management Groups (WMG) are registered under the Bangladesh Water Development Board. Each WMG must be formed from at least 55% of the total households in that area and minimum 40% of the members must be female. The management committee of each WMG will consist of 12 members elected by the members of the WMG. On the other hand, the general committee of the Water Management Association (WMA) will be formed consisting of four members from each WMGs nominated by the management committee of the respective WMG. WMGs will also include members of the respective UPs and WMA will include UP Chairman as advisors. WMGs play an important role in the economic development of local people through improved water management for irrigation.

Agricultural production is the main livelihood and source of income for the people living in the polder. Through proper water management, agricultural production can be increased which will help in family consumption along with more revenue opportunities by selling additional products. Blue Gold Program assists farmers in increasing agricultural production and in increasing market linkage to increase income. By proper water management for irrigation, it has been possible to increase the agricultural production. As a result, poverty reduction and standard of living have improved. Farmers can ensure more profit by producing goods according to market demand and marketing of good quality products. To achieve this goal, Blue Gold Program forms and implements farmer field schools. The farmer field school on fisheries, livestock and agriculture are implemented by the Department of Agricultural Extension to increase production by use of modern mechanism, to meet nutritional demand and to increase market linkages. Through horizontal learning process, the acquired knowledge from the farmer field school is passed to others so that everybody can be benefitted. The success of water management in agricultural production has brought a smile to the farmers in the project area.

Four polders which have been visited, in total there were 38 catchment areas, 7 Water Management Organizations, 159 Water Management Groups, 71,719 households and total number of the members

of the WMGs were 50,210. Total savings of the 159 Water Management Groups were taka 1,12,335 taka, whereas the total budget for operation and maintenance of sluice and irrigation canal has been estimated taka 9,49,600. Some of the WMGs have more savings than the expenditure, for example in polder 26, 2 and 2 extension. It is clear that the WMGs can bear operational and maintenance cost of the polder with their own savings; this seemed very positive to the visiting team. Due to lack of participation from the beneficiaries in maintenance and repair work, many polders have become non-functional.

From the discussion with involved beneficiaries and stakeholders, it has been reported that as a result of various polder activities undertaken by Blue Gold Program, there has been development in agriculture, fisheries, livestock and other sectors. However, there are still some problems with the polder management. Some significant problems are polder (embankment) height less than required, repair of sluice gates, river siltation, transportation problem due to lack of bridges in the excavated rivers, less use of modern methods for rice cultivation etc. Another major problem in the coastal areas is waterlogging. Heavy rain falls or high tide in the river results in frequent water logging which causes loss of crops and immense human suffering. Local stakeholders informed that some of the main reasons of waterlogging are due to river siltation, lack of necessary and timely dredging and fish culture by putting dams in the internal canals of the polder by the influential people. Waterlogging started in this region mainly due to gher and fish culture. Because of public interest, dams cannot be built in the internal canals of the polder for fish culture.

From the discussion with some Union stakeholders of Batiaghata and Dumurria Upazilla, it was found that it is necessary to stop making dams in the active rivers for fish culturing. All the leases of internal canals, small rivers and water reservoirs should be cancelled and also evict the illegal possessions of all the rivers and re-excavate them. According to them, local farmers think that without the strong support of local government and national government policy, it is difficult to recover those rivers and canals. Some of the local public representatives are also involved in this illegal possession of rivers and canals. Also, for the protection of river banks, embankment can be constructed and eventually develop it as tourist area and forestry.

The Dutch funded Blue Gold Program of Water Development Board is playing a role model for integrated water management in the coastal areas of Bangladesh. It is necessary to continue this as a role model even after the implementation period of Blue Gold Program. For this, government and private cooperation and effective participation of local people must be ensured.

For the continual agricultural development, it is necessary to continue the activities of the polder under Blue Gold program, and to increase the height of the polders, to do necessary re-excavation, repair and maintenance of sluice gates, to start embankment repairing and to make local water organizations more dynamic. Drinking water management, rainwater reservation, introduction of varieties of salt tolerant crop must be done urgently. Local administration and the stakeholders should work together so that the rivers and canals cannot be taken illegally by influential people. It is also necessary to maintain water flow by river and canal re-excavation, to evict illegal settlements from polders (embankment) and to keep free from water hyacinth. The Ministry of Land has to keep strict supervision so that no one can fill the river or canal with garbage.