



# ON HIGH ROAD TO PROGRESS

## CLIMATE, WOMEN AND SUSTAINABLE DEVELOPMENT

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# Water management for ...

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The term water management has different meanings to different people. Water is often considered to be free commodity; therefore, its management also varies. To me water management defined by Alvin Bishop is very relevant to our subject of discussion and he defined it as "Water management is a combination of science and art that requires application of knowledge of water, soil, climate, crops, and their interactions together with inputs and management for agricultural production".

As professionals of this field let us ask ourselves, are we using our water resources and doing water management in our country that meets the criteria set in the above definition? Probably not! We could achieve a lot through improved water management by achieving the development potentials. Some of the improvement potentials could be achieved without additional investment at least for infrastructure development.

**Infrastructure development**  
For protecting lives and properties of the people, FCDI facilities are essential. During infrastructure development for providing FCDI facilities, construction of embankments and irrigation and drainage canals are required. These infrastructures are mostly used for saving lives and properties and creating favourable environment for increasing agricultural production. Multiple uses of these facilities for afforestation and fish cultivation in addition to their primary uses will make them more cost effective.

**How the situation can be improved**  
Irrigation personnel should be trained to use FCDI facilities and associated infrastructures for their best use. It will require active participation of the stakeholders/beneficiaries, which includes partnership among beneficiaries and government agencies, but responsibility of project implementation lies with implementing agencies. Participatory management and more specifically participatory water management in water sector projects are widely dis-

cussed now-a-days. Under present condition, government agencies are still the main player and beneficiaries are consulted for their opinion and expected assigned roles by the implementing agency or agencies. To be more specific, so far one of the agencies, which has been assigned responsibility of project implementation and operating funding arrangement for the development works become "captain" in the implementation team. Beneficiaries are expected to be good listeners and to follow directions of the captain. In real sense, beneficiaries should be the decision makers while agency personnel, researchers and NGOs engaged in development activities in the project area would work as advisors.

Other important deviations from common thinking is that, in most FCDI projects, activities related to management, operation and maintenance (MOM) of flood control, drainage and irrigation infrastructures although not addressed properly, get all the importance by the project management. Other components like, efficient use of water, crop production, fish, forest and livestock production are not getting due importance. Improvements of these aspects are left with the concerned line agencies and beneficiaries of the project area. However, multiple and integrated use of the FCDI projects and integrated water resources management (IWRM) should be the priority areas for water sector projects.

Few examples are cited in this respect to emphasise and elaborate difference of the concept from the existing operational procedures. Guidelines for Participatory Water Management (GPWM) in Bangladesh states that "Participation is an important voluntary process in which local stakeholders influence policy formulation, alternative plans/designs, investment choices and management decisions affecting their communities and establish the sense of ownership". The GPWM indicate that "Give the local stakeholders a decisive voice at all stages of water management". The co-management concept validated through a case study supports decision - making power than the decisive voice.

The GPWM also supports participation of local stakeholders to "prepare production plans on agriculture, fishery, forestry and livestock development and environmental management plan based on the feasibility study" by the implementing agencies. In real life, the implementing agencies, BWDB and LGED are not doing these as existing government mandates entitles Department of Agricultural Extension (DAE), Forest Department (FD),

Department of Fisheries (DOF) and Livestock Department (LOD) to prepare their plan of action for the country including water sector project areas.

Co-management and participatory management support that mere participation in decision-making and consultation by agency personnel in water sector projects will not bring much benefit to the stakeholders. For increasing agricultural production, which is required for improved livelihood of stakeholders and for effective land and water resources in irrigation projects, stakeholders should have authority of decision—making for management of all infrastructures. Proposals agreed upon by the stakeholders should be implemented to achieve maximum benefit from the investment made in implementing irrigation projects and building infrastructure.

Action plans should be developed to emphasise on how water environment

level involving stakeholders, government and non-government organisations (NGOs) working with agriculture, soil and water based development programs for developing and implementing local level production plan. Several studies indicate that improvements are possible for increasing annual crop production, increasing irrigation/water use efficiency and improving livelihood of farmers.

Irrigation in Bangladesh at present is not cost effective. Over the years, number of deep and shallow tube wells and LLPs has increased, but area coverage per unit of these facilities has not increased rather decreased. This issue may be reviewed by practicing professionals and means for improvement should be developed. It is required to increase irrigation efficiency, increase service area of irrigation units, and minimise water distribution loss by adopting location specific appropriate

maintaining continuous standing water in rice fields. Moreover, it saves irrigation water, reduces cost of irrigation and thereby cost of production.

Government of Bangladesh (GOB) has accepted this technology as part of policy document for "Integrated Small Scale Irrigation Policy". The GOB advised agencies involved in irrigation management and development to adopt AWD method for irrigation of rice cultivation during Boro season as on an average it saves; five numbers of irrigations against about 25 irrigations required for standing water treatment and about 20% of irrigation water, which is about 600 liters of water for producing one kg of paddy. Adoption of AWD technique increase rice production by about 0.5 ton/ha and increase water productivity by 1.0 kg/ha/mm. It also saves fuel consumption by 23% and reduce cost of rice production by Taka 6000/ha. However, adoption of AWD requires one additional weeding compared to maintaining standing water in rice fields.

Bangladesh has created facilities for 5.40 Mha of irrigated (MOA, as of June 2014) and 6.14 Mha (reported by BWDB, as of June 2013) of flood control, drainage and irrigation (FCDI) area. Water potential permits irrigation development up to 6.55 Mha by 2025 and 7.45 Mha to the maximum (Water Resources Planning Organisation, WARPO, 2000). Therefore, about 6 Mha may easily be planned for year-round crop production through effective use of FCDI facilities. About 10 tons/ha of grain can be harvested in the FCDI area per year adopting available technology. Therefore, the country can produce 60 million tons of food grain (paddy + other grains + pulses) from the FCDI area, which may be about 45 million tons of net grain production (rice + other grains). This production target can be achieved adopting available research and management technology through integrated land and water management and adopting agricultural mechanisation. About 2 million hectares remaining even under traditional cultivation (which is not practical in the developing world, therefore, improved cultivation may be practiced) will make the country surplus in food production. However, it will require coordinated efforts for improved water management, use of mechanical power in agriculture, post-harvest technology, processing, and improved storage for favourable returns to the farmers.

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of the country can be managed to make positive influence on health, food availability and intake of nutrients and mitigate negative impact on these issues. Few examples of such action plan are:

- Conservation of excess water received during rainy season and effective use of rainwater and infrastructure developed so far can play important role in improving water availability in dry season, if comprehensive use of the facilities are ensured. Improved management at local and national levels through government and social interventions can solve the problem.
- Irrigation or water resources development of the country should be different for different agro-ecological regions of Bangladesh. The national development plan should be to maximise utilisation of rainfall, surface and ground water through conjunctive use of these resources. Comprehensive studies should be undertaken at the upazila

techniques.

Low water demanding crops during dry season may be cultivated for minimising irrigation cost during dry season in highly permeable area. Low water demanding crops like wheat, pulses and oil seeds may be cultivated in place of high water demanding crops like Boro (rice) if the economic return and farmers demands permit. Research findings proved this hypothesis effective through several researches out puts. **Alternate wetting and drying**  
Studies conducted in Bangladesh on alternate wetting and drying (AWD) since late 1970s and case studies conducted recently confirmed that AWD has been accepted in Bangladesh as an important water management technology for irrigated rice cultivation. It is a proven technology for water management, where water can be saved compared to flood irrigation for rice cultivation without yield reduction. In fact, yield under AWD is higher compared to

Action plans should be developed to emphasise on how water environment of the country can be managed to make positive influence on health, food availability and intake of nutrients and mitigate negative impact on these issues.

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