

Ensuring Food Security through increased Agricultural Production with efficient Water Resource Management



Government of the People's Republic of Bangladesh

Agriculture, Food and Water Resources Sector

**Ministry of Agriculture, Ministry of Food & Disaster Management, Ministry of Water
Resources and Ministry of Fisheries and Livestock**

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Brief overview

Agriculture

Bangladesh has achieved remarkable progress in agriculture since its independence in 1971. Food production has tripled from 10 million metric tons to 30 million metric tons over last 3 decades. In 1996-97 the country saw record food production and some surplus which ultimately helped to attain self sufficiency. The sector has also been playing very important role by employing 48.4 % of the total labor force. Its contribution to total GDP is estimated to be 20.60% in 2008-09. Crop agriculture has the major contribution to this sector with 11.55% share of total GDP and 56 % share of agricultural GDP (which includes livestock, fisheries and forests).

Fisheries and Livestock

Fisheries and livestock have been playing a very significant role and deserve potential for future development in the agrarian economy of Bangladesh. Currently the sub-sector contributes about 7.30% to the total GDP. The contribution from this sub-sector in agriculture GDP stands at 37.90% in 2008-09. The sub sector's contribution to the national economy is much higher than its share in GDP, as it provides all animal protein intakes.

Food Security

Despite a steady growth in agriculture Bangladesh has been facing persistent challenges like poverty, seasonal fluctuation of food supply and seasonality of prices etc. leading to stresses in access to food by the poor and vulnerable section of the population. Malnutrition among children and women (lactating and pregnant) is still high compared to WHO benchmark level. Food grain production, though continues to depend largely on nature, increased substantially over the years, following the introduction of High Yielding Varieties (HYV) and application of modern inputs like fertilizers, but its dependence on weather manifested by fluctuations in production leads to large instability in food grain prices, having serious implications for household food security and the general welfare of the people. The disasters had had significant impacts on prices of commodities and growth of the sector itself, in addition to other forms of economic hardship.

Water Resources and Agriculture

Agricultural production is inextricably linked to the nation's water resources management that has been playing major role in food production by way of irrigation during the crucial crop production cycle. The river systems, fifty seven of which emanate from outside the country,

have shaped much of the history, economy and culture of the people. The total drainage area of these river systems is more than 1.72 million sq. km, of which about 7% lies within Bangladesh. The rivers of Bangladesh form one of the largest networks of the world, with about 310 rivers including tributaries. Due to increasing scarcity of fresh water resources for irrigated agriculture, it will be necessary to produce more food with less water in future. Moreover, Agriculture's share of water will decline at an even faster rate because of the increasing competition for available water from urban and industrial sectors. Out of total cultivable area of 8.4 million hectares the irrigable area is 7.6 million hectares. Presently the area that comes under irrigation during the dry season is 5.05 million hectares. The area covered by surface water irrigation is 21.13% while groundwater irrigation covers 78.87%.

2. Recent progress

Food and Agriculture

The Government of Bangladesh continues to be committed to food security through increased production in the spirit of 1996 World Food Summit Declaration: "Access by all people at all times to the food needed for an active and healthy life". This pronouncement has been reflected in major policy documents of the Government, i.e. National Agriculture Policy 1999, National Livestock Policy 2007, National Fisheries Policy 1998, Report on Comprehensive Food Security Policy for Bangladesh (Task Force, 2000); Poverty Reduction Strategy Paper 2005, National Food Policy 2006 and PRSP II .

The '**National Agriculture Policy 1999**' was introduced with a vision of making the nation self-sufficient in food through increasing production of all crops including cereals and to ensure a dependable food security system for all. The relevant government policy document in the fisheries sub sector is the **National Fisheries Policy 1998**, which aims to enhance fisheries production, reduce poverty through creating self-employment and improved socio- economic conditions of the fishers and fish farmers, fulfill the demand for animal protein, achieve economic growth through earning foreign currency by exporting fish/shrimp and its by-products and maintain ecological balance and conserve biodiversity. The government has formulated a very comprehensive **National Livestock Development Policy (NLDP) 2007** to address the key challenges and opportunities for sustainable development of the Livestock sub-sector. The government's Commitment to MDGs, the National Food Policy, 2006 and Plan of Action (2008-2015) emphasize on ensuring food security for the people with three clear objectives that include (a) Adequate and stable supply of safe and nutritious food; (b) Increased purchasing power and access to food of the people and (c) Adequate nutrition for all individuals, especially women and

children. The PRSP II envisioned enhancing growth through development and dissemination of sustainable technologies which are ecologically adaptable, economically profitable, and capable of generating productive employment, diversification of both crop and non-crop, development of agri-business services, and human resource and ensuring food for all by way of making Bangladesh self-sufficient again in food by 2013.

Water Resources

The approach to water resources system management in Bangladesh has been based on structural interventions in flood control, drainage improvement, irrigation and river management projects as per National Water Management Plan (NWMP). The overall management of the water resources in Bangladesh is shared among the public, the NGOs, and the government agencies dealing with agriculture, industry, commerce, water sector, sewage, public health, municipal services, inland water transport, roads and highways, fisheries, forestry, environment, etc.

Growth of the sectors

Crop Agriculture

Crop production in Bangladesh is being transformed from subsistence level farming to commercial farming, though most agricultural production is still concentrated on a limited number of crops, with rice accounting for about 79% of total cultivated area. Other major crops include wheat (5.0%), jute (3.2%), pulses (3.4%), oilseed (3.0%), and sugarcane (1.2%) (2006-07). High value crops include vegetables, fruits, spices and potatoes which account for only about 5 percent of the total cropped area. Bangladesh has entered into the European market with exports of vegetables and other high value crops. The government has ensured increased private sector involvement in inputs distribution, liberalisation of equipment imports, deregulation, rationalisation of subsidy and restructuring of agricultural research-extension-farmers linkages and public-private partnership in the sector.

The introduction of BR 47 in the salinity prone southern coastal region and BR 33 in the Mogaø area for mitigating temporary food and unemployment situation in a certain segment of population in the north-western region are two of the important achievements of the crop sector. Significant increase in maize production has been achieved which is from 0.24 million metric tons in 2003-04 to 1.14 million metric tons in 2008-09. The hilly areas have been brought under intensive cultivation through different project intervention with ecologically fit crops, like lemon, pineapple, orange etc. Crop improvement through biotechnology has been undertaken by

the National Agricultural Research System (NARS) institutes. The development of markets directly connecting growers (76 markets have been constructed) under different projects is promoting agribusiness opportunities in the rural areas.

Fisheries and Livestock

The production of fisheries commodity including shrimp was estimated at 2.10 million MT during 2003-04 which has increased to 2.56 million MT during 2007-08 with an average growth rate of 5.11 over the preceding 5 years. During this period the total volume of export of fish and fisheries product increased from 54.14 thousand MT (2003-04) to 75.30 thousand MT (2007-08) with an average growth profile of over 5.0 percent. For ensuring the quality of exportable fish and fisheries products at per international standards all the laboratories of Department of Fisheries has been refurbished with modern appliances. The concept for establishing Community Based Fisheries Management (CBMF) is already in place in public water bodies. In order to produce quality seed of carps the government has taken measure to approve -Registration of Fish Hatchery Act. To ensure the quality of animal and fish feed, the government has approved Animal and Fish Feed Act, 2010. The livestock produces has shown a steady growth trend. The contribution of livestock sector to GDP is not high but the sector had attained a growth rate ranging from 2.41 to 7.23 over the period 1997-98 to 2007 -2008.

Irrigation and Flood Control

During 2003/04-2007/08 the Water Development Board's coverage of area under flood control had increased from 3.79 million hectares in 2004-05 to 4.52 million hectares in 2007-08. Protection of salinity intrusion remained constant during this period, because scope of undertaking such type of project was very limited. Achievement in irrigation coverage had declined in 2005-06 before it started increasing again. Through the FCD and FCDI projects BWDB created favourable environment for HYV rice production. Employment of rural skilled and unskilled labour in BWDB construction works and in annual operation and maintenance works provided wage income opportunities for the poor, which is roughly equivalent to one third of the total annual agricultural wage income.

Food Production and distribution

Per capita production of food grain was 524 gm/day in 2008-09 and per capita availability was 578 gm/day. The total production target of food grains for 2009-10 set by the Department of Agriculture Extension (DAE) is 34.47 million MT. So, the projected per capita production and per capita availability for 2009-10 stand at 555 gm/day and 615 gm/day respectively. The trends

of food grain import shows that wheat import is over 2.0 million tons while import of rice is around 0.5 to 1.0 million tons in most years, excepting 2007-08 when over 2.0 million tons of rice were imported ostensibly due to global food crisis compounded by two consecutive floods and cyclone Sidr in the country in 2007.

Ministry of Food & Disaster Management operates Public Food Distribution System (PFDS) and implements several safety net programs. Allocation to safety nets has been increased in 2009-10 than its previous years as the PFDS budget has stood 2.67 million tons as against actual distribution of 1.3 million tons in 2007-08 and 2.1 million tons in 2008-09. Number of beneficiaries to these programs has also increased. To support the extreme poor and the needy, the MOFDM is implementing the "Employment Generation for the Hard Core Poor" program with special emphasis to the 80 high poverty prone (40% and above) Upazillas. Tk.1,120 crore budget allocation for this program has been kept for the FY 2009-2010. Upazilla based poverty map was used to identify the concentrated pockets of the hardcore poor of the country. In order to address insufficient food grain storage facilities the present government has planned to increase the storage capacity of food grains by additional 0.784 million MT within the next 4 years (the present capacity is 1.47 million MT).

3. Current and Future Challenges:

Ensuring food security through increased agricultural production with efficient water management practices is a big challenge to overcome as it involves different cross cutting issues in different sectors. The challenges fall under different categories and demand specific actions at policy and activity level. Some of the important challenges are as follows:

Crop Agriculture

- a. To maximize production in order to improve food availability from domestic sources in the face of decreasing farm size, degrading soil quality and declining water resources;
- b. To harness productivity gains, making breakthrough in yield frontier technology;
- c. To improve water use efficiency and shift to water efficient food crops;
- d. Controlling degradation of soil fertility, unbalanced use of fertilizers and improvement of seed-fertilizer-irrigation technology;
- e. Reduction of gaps between yields achieved by experimental stations and farmers' fields in different regions;
- f. Lowering the price of irrigation appliances and inputs. Making available the spare parts, fuel and electricity for low lift pumps and deep tube wells;

- g. Strengthening linkage between research-extension-farmers and market;
- h. Availability of adequate quality seeds. Lack of farmers' desired knowledge level to adopt disseminated technologies;
- i. Creating a modern and sustainable information system for agricultural market;
- j. Capacity building of employees in every organization. Making available the required number of agriculture labour during peak seasons;
- k. Capacity building of Bangladeshi small holders (in horticulture, dairy, poultry, shrimp, fish and wood products) to handle the affect of liberalization of world trade;

Fisheries

- a. Conservation and Sustainable Management of Inland Capture Fisheries is a major challenge in the fisheries sub-sector. The current and emerging challenges encountered in aquaculture system includes among others, genetic erosion and quality deterioration of cultured species, availability of quality fish and shrimp seed from reliable source at reasonable price, inadequate supply of quality feed at affordable price to marginal fish farmer, limited access to financial institutions for capital and operational cost for aquaculture ventures and spread of disease outbreak due to intensification and wide commercialization of aquaculture, ineffective co-ordination among extension and research institutions.
- b. The challenges in flood Plain aquaculture are risk of reducing aquatic bio-diversity, limited access of traditional and subsistent fishers into flood plain for their livelihood etc. Shrimp and brackish water aquaculture faces difficulties in ensuring quality and traceability of product affecting export, ineffective linkage of shrimp farmers with hatchery owners and processing plants, lack of quality feed at affordable price and introduction of different regulatory measures by importing countries etc.
- c. The challenges in marine fisheries include resource survey, conservation and sustainable harvest. Quality assurance to fish and fisheries products are major concern that hampers the total growth of the sub-sector;

Livestock

Livestock and poultry farming in Bangladesh is affected by various challenges such as:

- a. Limited knowledge and technical skills of smallholder dairy farmers;
- b. Scarcity of feeds and fodder and poor quality of feeds;

- c. Frequent occurrence of diseases;
- d. Limited coverage of veterinary services including poor diagnostic facilities;
- e. Lack of credit support;
- f. Inadequate and improper market linkage constrained by transportation and processing facilities leading to low price to farmers and high cost to consumers;
- g. Lack of insurance coverage;
- h. Absence of market information;
- i. Lack of appropriate breeds; and j) absence of effective regulatory body.

Food Security

- a. To strike a balance between ensuring proper price for the numerous small producers (rice, poultry, dairy, fish, nursery etc.) on one hand and keeping food prices low for the poor consumers on the other;
- b. To invest more in income generating programmes and accelerate poverty reduction in rural areas;
- c. Managing intra-household food entitlements between men and women (especially lactating women) and between adults and children;

Water Resources

- a. Coping with the effects of climate change such as drainage congestion due to sea level rise and rise of river bed, salinization of land and water, increased morphological dynamics, more frequent disasters, and maintaining ecological balance along with conserving biodiversity for the growing population;
- b. Implementing Water Resources Management regime in trans-boundary river basins, when it involves agreements among sovereign nations sharing the same water.
- c. Managing the flow of the trans-boundary rivers in dry season while the country faces acute shortage of surface water due to upstream withdrawal and during wet season, when catastrophic flood occurs at regular intervals has been a formidable challenge ;
- d. Making available of quality groundwater throughout the country;
- e. Controlling flood and river erosion that causes serious threat to production of food as it damages the crops and takes away agricultural land leaving a large number of families with nothing to produce or buy from the market.

Proposed Way Forward

The overriding objective of the Government is to ensure adequate food supply for the 145.9 million people of Bangladesh. This is the basic and fundamental issue with respect to food security. Agriculture and the rural economy are recognized as key drivers of pro-poor growth strategy. The overall policy of the government is, therefore, to create an enabling environment and play a supportive role so that agricultural production can move from a predominantly subsistence level to a more diversified commercial pursuit with appropriate attention to productivity increase and environmental sustainability. While production of rice and other cereals will be supported for ensuring food security at the national and household levels, high value vegetables, fruits and other horticultural crops will be promoted through crop diversification programme. The dynamic potentials of the emerging sub-sectors of fisheries, livestock will be given critical policy attention. The Government is committed to facilitating input supplies, credit deliveries, technological support, promoting business development and marketing services. Along with the Government's pro-poor programme, the public-private partnership (PPP) will be strengthened so that the private sector can play a more active role in transforming agriculture and the rural economy.

In order to ensure food security for the nation and particularly for the extreme poor and the poor, the following actions may need to be taken:

1. Agriculture

- a. Introduction of small scale irrigation technologies and extensive utilization of surface water for irrigation;
- b. Utilization of fallow lands under cultivation. Reclamation of cultivable land in waterlogged areas. Extension of double rice cultivation in southern areas of the country;
- c. Extension of saline, cold, drought, flood, submergence and heat tolerant varieties to be developed by research stations
- d. Rainwater harvesting and ecosystem based crop zoning;
- e. Agricultural mechanization;
- f. Improvement of the quality of seeds, particularly HYV and hybrid seeds and their multiplication;

- g. Development of modern, irrigated and least-risk agriculture with greater reliance on competitive markets through supply of agricultural inputs at low cost;
 - h. Strengthening of the agricultural research and extension systems in order to develop new technologies relating to crop varieties, stress tolerant adaptation to climate change, integrated farming system, organic farming, improved agronomic and agro-processing technologies, and diffusion of the proven technologies;
 - i. Development and dissemination of ecologically sound and sustainable technologies such as Integrated Pest Management (IPM) techniques, mixed, organic and bio-fertilizer use;
 - j. Increasing profitable production of minor crops (pulse, oilseeds and spices) and thereby maintaining a balanced crop production and improving nutritional status of the people;
 - k. Development of suitable technologies in rain-fed, dry land and wetland farming system to enhance productivity;
 - l. Restoration/improvement of soil fertility through better management of the organic matter of soil to improve yields of crops;
 - m. Assistance to small and marginal farmers in forming groups and associations
 - n. Participation of NGOs in the agricultural development process;
 - o. Facilitation of access to markets and the promotion of efficient marketing system;
 - p. Implementation of measures to caution and minimize the damage to agriculture and rural economy brought about by natural calamities;
 - q. Development of human resources through education, training and motivation;
 - r. Development and dissemination of appropriate location-specific and cost-reducing production and post-harvest technologies for reduction of post-harvest losses, and strengthening of Public Private Partnership (PPP) in agriculture production.
2. In view of harnessing the optimal potential from fisheries and livestock sub-sector for ensuring steady supply of animal protein, additional employment generation, increased export earning, improved livelihood of poor people, the following actions need to be taken:

- (a) Raising per capita protein intake to 56g from domestically produced fisheries products;
- (b) Raising export earnings to US\$1.0 billion by 2015 from frozen shrimp, fish and value added products;
- (c) Improving conservation of aquatic biodiversity in inland open water bodies by establishing fish sanctuaries, habitat restoration, intervening CBFM practices, protecting breeding and nursing grounds of fish and shrimp, enforcing regulatory measures etc;
- (d) Improving food safety measures for domestic and exportable fisheries products through implementing Good Aquaculture Practice (GAP) and Good Manufacturing Practice (GMP) at all steps of supply and value chain;
- (e) Strengthening capacity of concerned stakeholders through implementation of demand driven HRM/ HRD programmes, extension services and facilitating access to information;
- (f) Strengthening applied research according to the demand of the industry both at micro and macro level;
- (g) Co-operative poultry and dairy development in potential areas of the country;
- (h) Replication of successful pro-poor models for community-based smallholder poultry and dairy development including appropriate contact farming schemes;
- (i) Promotion of supply chain based production, processing and marketing of milk and milk products;
- (j) Quality control of poultry and dairy feeds and feed ingredients;
- (k) Strengthening research, extension, management information system (MIS) and marketing services
- (l) Making available of drugs and vaccines for poultry and dairy farming

3. Measures pertinent to Food Security are:

- a. Maintain an optimum level of food stock;
- b. Ensure access to food at an affordable price for the hardcore poor, the disadvantaged groups and persons with disabilities;
- c. Operate special food program in the poverty/disaster prone areas;
- d. Increase awareness about safe and nutritious food through the mass media and school education;
- e. Ensure food security by strengthening the public procurement system;

- f. Distribute food under VGD (Vulnerable Group Development) cards area-wise in proportion to the population living below poverty line;
- g. Ensure adequate coverage under VGD;
- h. Strengthen OMS for increasing access to food for the urban poor;
- i. Encourage supply of nutritious food including pulses and oil seeds through high quality seeds, technology and credit support to the farmers;
- j. Run cooperative agricultural marketing to maintain stable prices of food;
- k. Improve food management and monitoring in the domestic and world markets to avert future crises;
- l. Ensure remunerative price to the producers through procurement of rice during the harvest period;
- m. Increase storage capacity by additional 0.784 million m.t within the next 4 years.

4. Management of water resources of the country

- (a) to combat river erosion, harmful sedimentation and land degradation due to pollution and desertification and (b) to accelerate reclamation of land from the Bay of Bengal.
- (c) Sustainable river management through capital dredging and bank protection of major rivers (by way of constructing rubber dam and other measures).
- (d) Management of water related disaster (flood, draught, cyclone etc) to minimize the adverse effect on rural/urban settlements, infrastructures, wild life and environment.

Expected Role of / Support from Development Partners

Bangladesh is committed to improving the livelihood and food security of the people, specially the goals and strategies envisaged in World Food Summit, 1996 and its plan of action, UN MDGs and follow-up efforts of the UN system after the global food, fuel, fertilizer and financial crises. Bangladesh is committed to the principles of Paris Declaration on Aid Effectiveness 2005 and Accra Agenda Action, 2008 and appreciates the principles set forth at the Lø Aquila G-8 summit, 2009. In order to be abreast with targets and commitments,

Bangladesh is in need of assistance and cooperation from the development partner in the following areas:

- a) **Assistance In Projects/Programs in the area of Crop Agriculture :**
 - a. Water/irrigation management for higher water productivity;

- b. Strengthening research activities including biotechnological research and extension system
- c. Adaptation and mitigation activities in agriculture to combat the climate change effects;
- d. Capacity building in seed development and production of HYV and hybrid seeds
- e. Soil fertility improvement including Soil inventory and soil testing facilities improvement
- f. Harvest Management
- g. Marketing system improvement
- h. Mechanization in agriculture and Zoning for crop production
- i. Protective cultivation of horticultural crops during rainy season
- j. Seed certification strengthening
- k. Knowledge gap and yield gap minimization
- l. Pest and Insect management
- m. HRD in science and agricultural research management
- n. Infrastructure support including lab, transportation
- o. Establishing markets exclusively for growers
- p. Entrepreneurship development for export

b) Assistance in Projects/Programs in Fisheries and Livestock Sub-sector:

Financial and technical assistances are highly expected in the following areas of Fisheries and Livestock sub-sector:

- Establishing infrastructure facilities;
- Developing adaptation and mitigation plans for sourcing fund under the Copenhagen accord (COP 15) to deal with impacts of climate change on fisheries resources;
- Promoting CBFM approach to establish access of poor fishers in public water bodies;
- Enhancing institutional capacity for ICT use, research product management, disease diagnosis, marketing, preventive and extension activities;
- Technological development for increased egg, milk and meat production;
- Improvement of surveillance system.

d) Adaptation and Mitigation for Climate Change. :

Climate change calls for renewed cooperation for food security in Bangladesh. The intensity and frequency of natural disaster has the potential to render a big section of the population vulnerable. Therefore financial and technical assistances are urgently needed to cope with the climate change affects.

e) More support to implement food sub-sector projects:

The food sub-sector requires more and more infrastructure to maintain a steady food market. Therefore, development assistance is expected in building infrastructures i.e. godowns, silos etc. on an urgent basis. Early warning and disaster preparedness programs also require financial and technical assistances from the Development Partners.

f) Extensive Cooperation in Safety Nets:

This may help contain diversion of scarce development resources and attain development targets elsewhere in the economy and broaden the muchódesired ambit of social safety net programmes and increase the size of transfer.

g) Strengthening monitoring capacity and computerization of storage and distribution system:

Complete computerization of the monitoring storage and distribution system will add to the effective fiduciary oversights and efficiency of the management. Government will appreciate financial and technical assistance in these area.

h) Support both for the study and investment projects in irrigation sub-sector, river management projects, costal zone management projects, climate change monitoring project and land reclamation and settlement projects of the Ministry of Water Resources is highly expected;

i) Development Partners may pursue the possibility of furthering regional cooperation building on the emerging cooperation between the riparian countries.

j) Separate local consultative groups of external funding agencies on crop agriculture, fisheries and livestock, food and water resources sub-sectors can be established to facilitate coordination among donors in promoting sector development and proceeding with various sector operations.

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