

Food Security Challenges: Impact of Climate Change

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The **Government of Bangladesh** (GoB) considers agriculture, food security and nutrition to be major priorities. While the country has made impressive achievements over the last 40 years, it is increasingly faced with considerable challenges: *population growth* (still growing by over 2 million people per year); *climate change* (sea intrusion, natural disasters, increasing salinity); *deteriorating access to increasingly scarce natural resources* (water, land); *vulnerability to price shocks, persistent poverty* (leading to poor access to food); and one of the highest *malnutrition* rates in the world. Therefore the Government considers the fight against food and nutrition insecurity a key strategy for Bangladesh to become a middle-income country.

By definition:

Food security encompasses three major dimensions-availability, access, utilization and nutrition of food. Food security, thus, is a multi-dimensional development issue.

Availability

Bangladesh has made remarkable progress in domestic food production over the past three decades. Total annual food grain production increased from less than 10 million tons in early seventies to more than 33 million tons by the year 2009-10. There has also been substantial improvement in the availability of food. Per capita availability of food grains increased from around 16 ounces per day to around 21 ounces during this period.

Accessibility:

Now comes the point of accessibility. Producing more food does not guarantee access to food. People must have the purchasing power to buy food. Therefore, the economy as a whole must grow.

Bangladesh has been facing persistent challenges like poverty, seasonal fluctuation of food supply and seasonality of prices etc. constraining access to food by the poor and vulnerable section of the population.

Food security at household level is closely linked with poverty. These poverty and food security problems are massive, with approximately 31% of the population lacking the resources to acquire enough food and consequently remaining below the poverty line. Beside the rising food inflation have severe impacts on the marginalized people.

Utilization:

The objective function of food consumption is to improve and maintain nutritional status which is determined by the level and composition of food intake, general health status of people, and the sanitary and hygienic conditions under which food is prepared. While total food consumption increased, consumption of rice decreased from 1991-92 to 2005 implying a slow diet diversification.

Now comes the point of linking Climate Change with Food Security:

Impacts of climate change are visible in Bangladesh in the form of temperature extremes, erratic rainfall, increased number of floods, cyclones, droughts, and increasing prevalence of rough weather in the Bay.

Crop Sector:

Climate change may impact all dimensions of food security. It is predicted that agriculture will be mostly affected which is the main economic driver, accounting for nearly 20% of the GDP and 48% of the labor force. World Bank (2009) predicts that national rice production will decline under all of the Climate Change Scenarios and that the annual growth rate will reduce from 2.71% under the Variability Scenario to 2.55% under the Average Climate Change Scenario during the period 2005-2050. Increasing atmospheric Carbon-dioxide concentrations have been predicted to decrease rice yield

in the future. Such yield reductions under changed climatic conditions could significantly affect food production and food security in Bangladesh.

In the coastal area, situation will be exacerbated by salinity intrusion and inundation of vast agricultural land caused by sea level rise (SRDI, 1997). Simulation exercise suggests that 1.5 metre of sea level rise will cause a loss of about 16% percent of the total land of the country and a population displacement of 17 million to 25 million (CDMP 2008).

Because of the effects of climate change, use of inputs like fertilizers, pesticides, and irrigation may increase substantially, resulting in higher production costs. Water stresses will also be developed as climate change will result in floods, water logging, and higher salinity.

Fisheries and Livestock Sector:

The fisheries and livestock sectors are two major pillars of Bangladesh's economy, and more than 10 million people directly depend on these sectors for their livelihoods. These sectors are also important for food, nutrition, income, export earning, and transport. Climate change has both direct and indirect impacts on fish stocks. Direct effects act on physiology and behavior and alter the growth rate, development, reproductive capacity, mortality and migration. Indirect effects alter the productivity, structure, and composition of the ecosystem on which fish depend for food and shelter.

Bangladesh Fisheries Development Corporation (BFDC) shows that fisheries resources of the Bay of Bengal have declined by 25 – 30% over the last couple of decades. There is a considerable threat of losing over 4 million metric ton of fisheries by the year 2030.

The current contribution of livestock sub-sector to overall GDP is about 2.73% which is 17.15% of agricultural GDP. The export earnings from leather and leather goods is 4.31% of the total export, 20% of the population is directly and 50% is partly dependent on this sector. Bangladesh Economic Review 2009 shows the highest growth rate of

livestock sub-sector in GDP. Chowdhury and Karim (2009) indicated that livestock production could be affected by the climate changes due to reduction in the quality and availability of feed and water, heat and other environmental stresses, and preponderance of livestock parasites, pests, and diseases.

Livestock production is closely integrated with crop production. Except for commercial poultry, crop by-products comprise the major part of livestock feed in the country. Thus any decrease in the crop production will naturally reduce the feed availability for the livestock population. The average temperature in Bangladesh is 18⁰C in winter and 28⁰C in the summer. If global warming causes Bangladesh temperature to rise further 2⁰C by 2050, together with relative humidity of 60 to 95%, all most all species of livestock will be under heat stress conditions.

The combined effect of all climatic impacts will severely affect on the productivity of agriculture and thus the livelihoods of a large number of poor people, especially, those who are already food insecure and vulnerable. The estimated economic loss of super Cyclone Sidr and two times flood in 2007 was around 2.7 billion US dollars. Crops fully damaged by Aila were over 3 hundred thousand acres and that by sidr were 7.5 hundred thousand acres. The 1991 cyclone caused over 138,000 lives. Over 4 million families were affected by 1991 and 2007 cyclones. So, not only will country's production suffer set back, the climatic impacts would also create enormous stresses on the livelihoods of the displaced people.

Climate change will also have a direct impact on environmental sustainability as it will destroy the Sundarban mangrove forest and will also cause fundamental alterations in biodiversity. Climate change is projected to reduce poor people's livelihood assets and alter the path and rate of economic growth due to changes in natural resource base.