

## Climate change and food security

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Bangladesh is among the most precarious and unpredictable countries due to climate risks (Bangladesh Country Study, 2013). It is regularly stricken by annual flooding, or shortage of water during dry seasons; it frequently suffers from cyclones, storm surges, along with changing groundwater aquifer situations. Most of the land mass comprises of floodplains, and up to 30 percent of the country experiences annual flooding during the monsoon season, while 60 percent of the country is susceptible to extreme floods (UNESCAP, 2013).

The national growth and poverty reduction policies and strategies need to integrate and expand efficient adaptation measures for a sustainable growth pathway. At the local level, the communities in the vulnerable parts of the country need coping mechanisms to adjust to adverse climate hazards. In addition to the current strategies and policies addressing this urgent issue, innovative, unique, and contextual adaptive measures need to be devised.

Among the numerous potential unfavourable outcomes of climate change, the risks posed to the agriculture sector and food industry are among the most disruptive to the health of the citizens, to the economy, and growth in Bangladesh. Agriculture comprises a vital economic sector in Bangladesh, amounting for nearly 20



percent of the GDP and 65 percent of the labour force (World Bank, 2010). The performance of this sector has significant effect on economic growth, trade balance, budgetary position of the government, the intensity and patterns of poverty and malnourishment in the country. Furthermore, agriculture sector is the contingent source of income and

employment for most of the poverty-stricken rural residents.

The achievement of food self-sufficiency continues to be a key development agenda for the country. The UN Sustainable Development Goal 2 aims to "end hunger, achieve food security and improved nutrition, and promote sustainable agriculture." The contemporary challenge for Bangladesh is to improve productivity, especially as demand for food increases with the growing population, and improved incomes, whereas, climate conditions are depleting. On the other hand, over-use, decline and changes in resource quality place further pressures on the scarce land and water resources.

Climate change poses crucial impediments to sustainable development for

Bangladesh. Sea level rise due to climate change could engulf 17 percent of the land area in Bangladesh by 2050, diminishing cultivatable areas and causing 35 million people to be landless (Ismail, 2016).

**Food system and food security**  
"Food system" typically describes all the elements of manufacturing, processing, transporting, selling, storing, and consuming food. To be precise, food system encompasses particular actions, resources, and structure that collectively influence the level of food security within a region or community.

There are four elements of food security, namely - food availability (manufacture and delivery), food access (affordability, distribution, and preference), food utilisation (dietary value, social value, and food safety), and food stability (government food security strategies) (World Food Program, 2016; Anik et al. 2012). One of the most damaging effects of diminishing food security is that the worst impact of the cascade of risks is borne by the most vulnerable groups of the population. The poorest segment of the population, who spend the largest share of income on food, are likely to be worst affected by any crisis in food availability.

**Consequences of climate change on food security**

Agricultural production is anticipated to be extensively harmed by the rapid expansion of soil salinity that arose from sea levels rising, tidal flooding, and intensifying storm gushes. More than half the area of Bangladesh is barely five meters above sea level, posing ominous threats to its coastal population. According to scientists, sea levels could soar 50 to 130 cm by the year 2100 (Ismail, 2016). Despite the most effective measures, for example, the

execution of the 2015 Paris Agreement, sea levels are predicted to surge by 20 to 60 cm by 2100.

Food security will take a dark plunge because 30 percent of cultivable land is located in coastal areas. A study by the World Bank has suggested that increased soil salinity will lead to a 15.6 percent wane in the harvest of high-yield rice. It can potentially lead to a shortage of irrigation water for farming during the dry season and depleted source of revenue for farmers (World Bank, 2010).

Agriculture in Bangladesh is largely dependent on weather. One cyclone may destroy a significant volume of the seasonal harvest. Cyclone Sidr destroyed nearly 95 percent crops in coastal districts when it crashed into Bangladesh in 2007 (ADB, 2013). Food security will be immensely jeopardised due to frequent and intensified extreme weather incidents resulting from climate change.

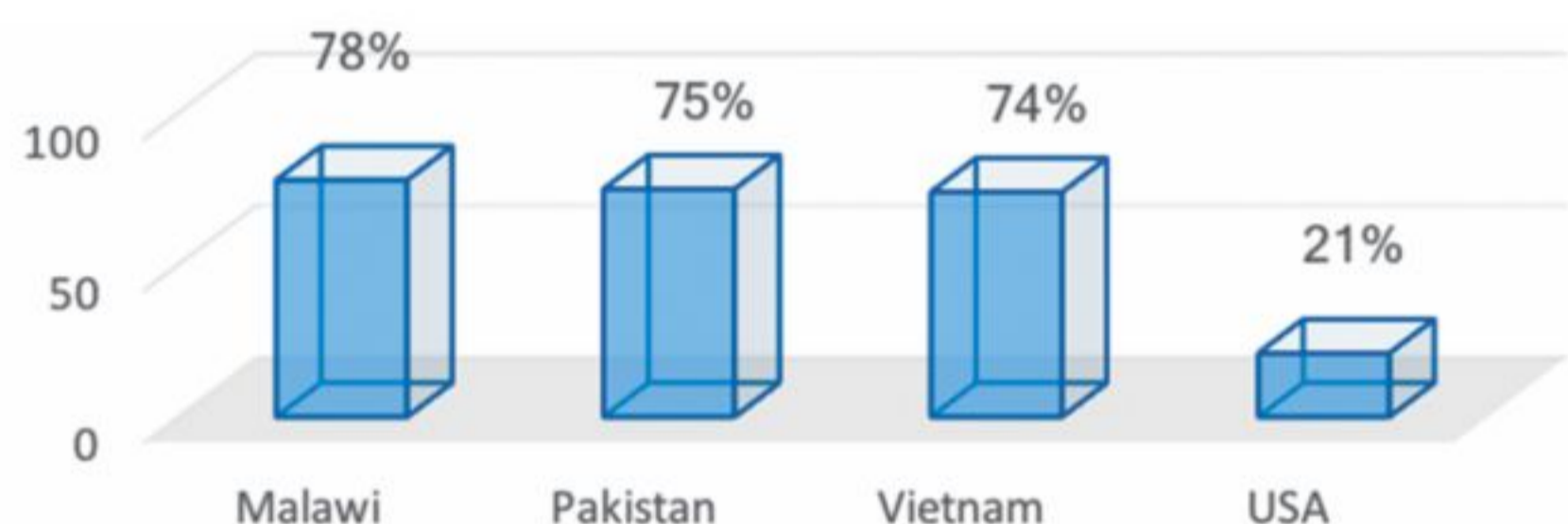
**Estimated Loss Due to Floods (USD)**

| YEAR                    | 1988        | 1998      | 2004        | 2007         |
|-------------------------|-------------|-----------|-------------|--------------|
| LOSS OF INCOME / ASSETS | 330 million | 2 billion | 2.2 billion | 1.06 billion |

SOURCE: NATIONAL STRATEGY FOR ACCELERATED POVERTY REDUCTION II GENERAL ECONOMICS DIVISION, PLANNING COMMISSION GOVERNMENT OF PEOPLES REPUBLIC OF BANGLADESH (OCTOBER 2008)

Smallholding farmers' sustenance of will suffer detrimental repercussions of the increasingly recurrent aridity due to decreased rainfall. For instance, the drought of 1994-95 led to a decline in the production of grains by about 3.5 million tonnes and led Bangladesh to

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