

Climate Change and its impact on Bangladesh

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Impact of Climate Change in Bangladesh is an extremely crucial issue and Bangladesh is one of the most vulnerable nations to the impacts of Global Climate Change in the coming decades¹. Bangladesh is watered by a total of 57 trans-boundary rivers coming down to it: 54 from neighbouring India and 3 from Myanmar, and situated at the bottom of the mighty GBM river system (comprising the *Ganges*, the *Brahmaputra* and the *Meghna*). Nearly a quarter of Bangladesh is less than seven feet above sea level. More than one thousand people are living per sqkm with the national population increasing by 2 million people each year. Almost half of the population is in poverty (Purchasing Power Parity of \$1.25 per person a day).

Statistics and predictions

On Climate Change, the Earth's temperature is likely to increase by 2 to 4.5 degrees Celsius by the end of the century. According to the Intergovernmental Panel on Climate Change (IPCC), sea levels are expected to rise by 0.18 to 0.59 meters during that time. The US Environmental Protection Agency states that if polar ice continues to melt in step with global average temperature, sea levels could increase by 0.49 to 0.79 meters by 2100. IPCC findings also states that a 45 cm sea-level rise will inundate almost 10.9% of the territory of Bangladesh and will displace 5.5 million population of coastal regions.

Unless action is taken now to limit carbon release in the atmosphere, South Asia would suffer more droughts and floods, rising sea levels and declines in food production. In Bangladesh, 40% of productive land is projected to be lost in the southern region of Bangladesh for a 65cm sea level rise by the 2080s. Flood areas could increase by as much as 29% for an increase of 2.5°C in Bangladesh. With the rise of sea-level up to one meter only, Bangladesh could lose up to 15% of its land area under the sea water and around 30 million people living in the coastal areas of Bangladesh could become Refugees because of Climate Change impacts.

It is anticipated that, by 2020, from 500 to 750 million people will be affected by water stress caused by climate change around the world. Sea level will rise 2% in the year 2020, 4% by 2050 and 17.5% by 2100. It will affect agriculture, hamper food security, create health hazard, and aggravate poverty. Around 40% - 45% of Green House Gas (GHG) emissions are required to be reduced by 2020 and 90–95% by 2050.²

Consequences

The regular and severe natural hazards already batter the country like tropical cyclones, river erosion, flood, landslides and drought to increase in intensity and frequency as a result of climate change. Rising sea levels will gradually inundate Bangladesh's coast and river erosion

¹According to German Watch's Global Climate Risk Index (CRI) of 2011

²This is using the 1990 GHG concentration levels as a benchmark.

will destroy land and homes. These and the many other adverse effects of climate change will have profound repercussions for the economy and development of the country. This is due to its unique geographic location, dominance of floodplains, low elevation from the sea, high population density, high levels of poverty and overwhelming dependence on nature.

One of the most intense impacts will be the forced movement of people throughout Bangladesh as a result of losing their homes, lands, property and livelihoods to the effects of climate change. It is estimated that rising sea levels alone will displace 18 million Bangladeshis within the next 40 years. The vast majority of these people will be displaced domestically- not across international borders presenting the government with enormous challenges, particularly when it comes to finding places to live and work for those who have been displaced. The number of "climate change refugees" in Bangladesh is expected to rise dramatically in the coming decades. If sea levels rise by just 3.2 feet, one-fifth of the country located on the delta formed by some of Asia's biggest rivers, is expected to be covered in water. Poor populations are the most vulnerable to the changing conditions.

Bangladeshis have already started to move away from the lowest-lying villages in the river deltas of the Bay of Bengal; 1.5 million of the five million slum inhabitants in Dhaka, moved from villages near the Bay of Bengal.

In Bangladesh, climate change will affect many sectors, including water resources, agriculture and food security, ecosystems and biodiversity, human health and coastal zones. Many environmental and developmental problems will be worsened by climate change. Predicted rainfall increases, particularly during the summer monsoon, could increase flood-prone areas in Bangladesh.

It is predicted that climate change could have devastating impact on agriculture which is a key economic driver in Bangladesh, accounting for nearly 20 percent of the GDP and 65 percent of the labor force. Crop yields are predicted to fall by up to 30 per cent, creating a very high risk of hunger. The global warming increases risk of flooding, erosion and mudslides during the wet season and it could lead to disappearance of many glaciers that feed many rivers in South Asia. The achievement towards the MDGs, such as eradicating poverty, combating communicable diseases and ensuring environmental sustainability could be in jeopardy.

The following impacts of climate changes have already been observed in Bangladesh: Summers are becoming hotter, monsoon irregular, untimely rainfall, heavy rainfall over short period causing water logging and landslides, very little rainfall in dry period, increased river flow and inundation during monsoon, increased frequency, intensity and recurrence of floods, crop damage due to flash floods and monsoon floods, crop failure due to drought, prolonged cold spell, salinity intrusion along the coast leading to scarcity of potable water and redundancy of prevailing crop practices, coastal erosion, riverbank erosion, deaths due to extreme heat and extreme cold, increasing mortality, morbidity, prevalence and outbreak of cholera and diarrhea, etc.

The climate change in Bangladesh creates insecurities for food, water, life, property, settlement, livelihoods and others. Environmental degradation, degradation of land resources ultimately reduces food and health securities etc. Increased cyclone, storm surges, floods, river

bank erosion destroys and damage peoples properties including land, house, cattle, and other livelihood assets and living essentials. Frequent disasters increases damage and loss by many folds. Following the climate change, the river bank and costal erosion are increasing at alarming rate.

The rough sea limits fishing opportunities. Health hazards, malnutrition, access to services prior, during and after disasters reduce working days and opportunities. Women and disadvantaged groups are suffering more during disasters as they don't receive warning in time and women has to take care of their children, elderly and disabled. Most migrants end up in urban slums, particularly in Dhaka and this constant influx of people is contributing to rising crime and insecurity in these areas. About 20 million people in the coastal areas of Bangladesh are already affected by salinity in drinking water and Salinity intrusion into the country side reached 100km and degrades land resources.

The fisheries sector has also experienced an adverse effect because of the impacts of Climate Change. The fisheries sector contributes about 3.5% of the GDP in Bangladesh and people depend on fish products in order to meet up majority of their daily protein requirements. There are around 260 species of fish in the country and almost all the varieties are sensitive to specific salt and freshwater conditions.

In a high density country like Bangladesh, the effects of Climate Change on the Surface and Ground water resources will be very severe and alarming. Changes hydrology will have a significant impact on the country's economy, where people mostly depend on the surface water for irrigation, fishery, industrial production, navigation and similar other activities. Bangladesh relies almost entirely on groundwater for drinking supplies because the rivers are so polluted. The resultant pumping causes the land to settle. So as sea levels are rising, Bangladesh's cities are sinking, increasing the risks of flooding.

Majority of the population living in coastal area are somehow affected by coastal floods, tidal surges, river-bank erosion, salinity, tropical cyclones etc. Agriculture, industry, infrastructure (school, hospitals, roads, bridges and culverts etc.), marine resources, forestry, biodiversity, human health and other utility services are the major affected areas of livelihoods. Since most of the country is less than 10 meters above Sea level and almost 10% of the population of the country is living below 1 meter elevation the whole coastal area is highly vulnerable to high tides and storm surges.

Biodiversity would be reduced in some of the most fragile environments, such as Sundarbans and tropical forests. Bangladesh has got a wide diversity of ecosystems including mangrove forests at the extreme south of the country. The "Sundarbans" a World Heritage, is the largest Mangrove Forest in the world, comprising 10,000 sq km (mostly in Bangladesh) of land area along the Bay of Bengal. Around 425 species are living there including the most significant famous Royal Bengal Tiger. Climate Change impacts will have negative effects on the Ecosystem of the Forest recourses in Bangladesh while the Sundarbans is likely to suffer the most.

The urban poor are directly at the risk of natural disasters being enhanced by the impacts of Climate Change- especially in the shortage of the necessary infrastructure as well as

employment opportunity for them in the major cities of the country. Women are especially vulnerable because of the gender inequalities in the socio- economic situation.

Mitigation and Adaptation

Bangladesh has established the Bangladesh Climate Change Trust Fund (BCCTF) and the Bangladesh Climate Change Resilience Fund (BCCRF) to address the challenges due to climate change.

Bangladesh is exempt from any responsibility to reduce GHG emissions, which primarily causes global warming. Large developed industrial nations are emitting increasing quantities of GHGs. The country cannot go far in struggle with reducing emissions and fighting global warming with the supported funding. There exist plans such as the 'National Action Plan on Adaptation' (NAPA) of 2005, and the 'Bangladesh Climate Change Strategy and Action Plan' (BCCSAP) of 2009. In an effort to be a 'Middle Income Country' by 2021, the country is focusing on increasing agriculture production, productivity, water management techniques surface water infrastructure irrigation, effective fisheries and promoting poultry and dairy development.

Various countries have pledged to provide funding for adaptation and mitigation in developing nations, such as Bangladesh. This funding is available for developing nations to build their capacity to reduce emissions and responds to impacts of climate change. This funding will be balanced between mitigation and infrastructure adaptation in various sectors including forestry, science, technology and capacity building. The Copenhagen Accord (COP 15) pledges \$100 million of public and private finance by 2020.

Way forward

Bangladesh should place emphasis on capacity building and disaster management, institutional and infrastructure strengthening, development of research and low carbon technologies in order to create an inclusive and truly comprehensive mitigation scheme. Governments should develop national action plans on climate change adaptation and to allocate fixed proportion of national budgets to check on the effects of climate. Engagement in constructive debate on the issues of technology and production transfer should be encouraged.

Many of the worst climate impacts could still be avoided by holding warming below 2°C, and urgent action is needed to build resilience through economic development to risks to agriculture, water resources and coastal infrastructure. With higher population and rapid industrialization, Bangladesh should be on its way to developing a low-carbon path given it initially receives significant financial and technical support from the international community and national goals of economic growth and social development is not hampered.

Bangladesh would need to prepare for long-term adaptation strategy and it is necessary to identify all present vulnerabilities and future opportunities, adjusting priorities and trade policies in the agricultural sector while promoting training and education throughout the masses in all possible spheres.