



Climate Change in Bangladesh: Its Impact and Ways to Mitigate

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ABSTRACT

Bangladesh ranked 6th in 2017 Global Climate Risk Index. Rising sea levels is one of the most catastrophic consequences of climate change. Sea-level rise of up to a meter over the next century, as predicted by the scientists, would inundate the homes of millions of people. In addition, other potential effects of climate change like severe cyclone formation, prolonged flood, salinity intrusion, tidal/storm surge, coastal erosion and draught will have devastating consequences on agriculture and livelihoods in Bangladesh. People will lose their homes, agriculture fields, sweet water, fishery, poultry, livestock and everything. The homeless rural people will migrate to urban slums in search of shelter and non-agricultural employment, putting greater pressure on scarce housing, water, sanitation, and energy services. Bangladesh alone is not able to face such a large-scale problem. A global initiative to mitigate the impacts of climate change is absolutely necessary.

Introduction:

Bangladesh experiences vulnerabilities to the adverse effects of climate. In between 1976 and 2019 Bangladesh has experienced an average rise in temperature of 05⁰ C. The maximum rise of temperature has not been uniform in nature. Between 1976 to 2019, 5⁰ C increased in Dhaka, whereas 0.9⁰ C increased in Chittagong and Sylhet division. As per the German watch's Climate Risk Index Bangladesh has ranked seventh most affected by climate calamities during period 1999-2018. It has indeed an impact on natural environment, economy, food security, health immigration and so on.

Natural Environment:

Bangladesh is a natural disaster prone country. Due to climatic change Bangladesh experiences from floods, cyclones and landslides every year. Bangladesh has a history of devastating effects of cyclone. Climate change has also an effect on floods. The most remarkable and catastrophic floods occurred in 1952, 1955, 1974, 1984, 1987, 1988, 1993, 1998, 1999, 2000 and 2007. Flood causes extensive damage to life and property. The most devastating human casualties seen in the flood of 1988 which was worst in nature. About 2000 of human casualties occurred between year 1987-2007. Tornado is also a natural disaster which can cause tremendous destruction of life and property. Tornadoes of 1969, 1974, 1977 and 1989 are noteworthy. Every year Bangladesh experience draught due to less rainfall and lack of water. The droughts of 1950, 1951, 1957, 1958, 1967, 1972 and 1979 were severe in nature. Due to climate change landslide occurs almost every year in Bangladesh. In 2007 more than 120 people were killed in landslide in Chittagong.

Economic:

Climate change has immense effect on country's economy. Higher commodity price, damaged agriculture and damaged infrastructure may lead to financial crisis to the country. Due to sea level rise, a huge amount of agricultural damage will occur many people will lose their home and force. Sudden climate change will also have an effect on country's finance, trade, export-import, supply chain etc. In a study, it was revealed that 4⁰ C increase in temperature would have severe impact on agriculture which will cause 28 percent less production of rice and 68 percent less reduction of wheat. Again, excessive rainfall in monsoon season and less rainfall in winter has also a deterrent effect on crops. At the same time fisheries sector are also affected by climate change which contributes 3.5 percent of the total GDP in Bangladesh. The Asian Development Bank estimated Bangladesh may experience 2% GDP annual loss by 2050 due to climate change.

Human Health:

Human health is directly and indirectly related to climate change. In the year 2004 around 800 people died due to flood, while 3,500 people death recorded in 1991. There are many climate sensitive diseases. Usually, dysentery, diarrhoea, dengue, hypertension, skin diseases increases during summers. Risk of human health increases from increased floods and cyclones. Usually, after flood the probability of affecting by diarrhoea and dysentery increases rapidly. The non-availability of clean water is caused by increased flood of drought. Bangladesh government had to spend a large amount of money every year in controlling the situation caused by natural disasters due to climate change. Lack of health care support, gynaecologic, obstetrics care adds suffering and many emerge as a societal conflict.

Longer Monsoon and Erratic Rainfall:

Being a tropical country Bangladesh experiences some of the wettest monsoon in the world. It has been observed that during peak monsoon from June to August the monthly rainfall has declined by 60 millimetres. On the other hand, the mean monthly rainfall of September and October has increased by 45 millimetres. So, it is inevitable that the monsoon is getting longer and extending from March to October. The temperature rise in winter month erratic rainfall pattern have eroded the distinct seasonality in Bangladesh.

Increase of Salinity:

Due to for rainfall the river suffers from low flow. Normally low flow condition starts in the post monsoon. Due to low flow the salinity increases due to lack of flushing. Normally, the people of south-western part of the country suffer and became vulnerable. The people of the south eastern part has shown their concern regarding increased salinity.

Crop Production:

Rice is the staple food of Bangladesh. The sea level rise has an effect of decreasing the Aman rice. Due the greater flow of water and flood the production of Aman rice may be reduced. Again, due to lack of irrigation the production of Boro rice may also decreases. It is reported that the agricultural production by 45 percent.

Agriculture:

Bangladesh has a great prospect in agriculture. Flood free area with embankments enhances a great prospect in agriculture. Usually, If these is breach in embankment, fish will go out of the pond. Due to flood the embankments are overflowed by water. As a result, fish released out of the pond and fish-farmers inflict losses. Therefore, climate change has great impact on agriculture.

Coastal Shrimp culture:

Bangladesh shrimp farmers in establish farms outside embankments this create earthen mini-polders. Locally known as "ghers". Rise of water level threatens the shrimp culture. Other hand, when temperature crosses 32⁰ C, the small shrimp has higher rate of mortality. Therefore, warmer water has detrimental effect on shrimp production.

Livestock:

Due to natural disaster every year a large amount of animal becomes casualty. Prolonged flood increases the death of livestock. At the same time, animals are vulnerable to diseases due to drought. Due to intake of salinity water animal fell victim to diseases. This factor affect the livestock of coastal area furthers.

Coastal Infrastructure:

Only 1m rise of water at sea level will inundate 11% of the country's population. At the same time increased flow of river will affect 60% of the country's population, as a study said. The most vulnerable population will be residing in area Khulna. Though 4,800 km of coastal area are

protected 4000 km protection is needed which would cost additional 1 Billion US\$. In future it is predicted that about 13 million people will be needed to restore which would cost around US \$ 13 Billion.

Affect on Sundarban:

Sundarban is one of the biggest mangrove forests in Bangladesh. It is the world's largest contiguous mangrove ecosystem with total area of 10,000 sq km. Total 425 species of animal have been identified, including 42 species of mammals, 300 species of birds, 35 reptiles and 8 amphibians. It is declared as world heritage site by UNESCO. About 3.5 million people are depending on livelihood from Sundarban. A major change in ecosystem is observed due to increase of salinity in Sundarban due to prolonged hot weather. Due to the increased salinity the shrimp area are vulnerable. Due to greater rainfall the saline water are normally pushed to the sea. Again due to dry weather the sea tend to push the saline back to inland. Due to climatic change every year cyclonic storm causes several damage to the forest and the species. It also has devastating affect of peoples habitation over these. Relief plan should be given nose focus and comprehensive risk reduction culture should be induced. Since, Greenhouse gas emission causes global warming a vast plantation programme to be made at national level. A comprehensive policy should be made and implemented an water agriwltre should forward to tackle the situation together.

Mitigation and Adaptation:

- Comprehensive national policy can be made to reduce the vulnerability.
- Addressing food security and production to avoid shortfall and developing agricultural development.
- Various development programmes may be planned for the targeted poor population.
- Focusing and emphasis on prepared mess to reduce the loss of life and property. Formulating disaster action plans in disaster prone areas.
- Re-shaping and re-designing social and economic practices to respond anticipated environmental changer.
- Establishing a culture of resilience to mitigate the catastrophe's caused by climate change.
- Apart from relief response a comprehensive risk reduction culture to be ensured in collaboration of various civil society organisations.
- For rising sea levels, natural land accretion and using land for framing purpose may partially mitigate the land lost.
- Greenhouse gas emission is a primary cause for global warming in Bangladesh. Necessary measures to be taken to stop such emissions from various industrial factories.
- For capacity building and respond to impacts various develop countries allot funds for the developing nations.
- Already Bangladesh has established Bangladesh Climate Change Trust fund (BCCTF) and Bangladesh Climate Change Resilience Fund (BCCRF). Already those funds are allocated with US \$2000 million and more US\$ 114 million in the pipeline. Already 3000 cyclone shelters were constructed and 10,000 km embankments were erected. Bangladesh should not only focus on structural development but also low carbon technologies and comprehensive mitigation scheme.
- Bangladesh should formulate national policies on water, agriculture, environment and afforestation and natural resources management. Special attention to be given in flood and drought prone areas.
- National Land Use Policy (NLUP) already planned to bring 25% land under forest. It also focusing on coastal green belts to reduce the vulnerability of cyclone and storm.
- A comprehensive plan of plantation can be adopted along the river bank.
- Offer training to the poor people on alternative livelihood.
- Carrying out research on impact of climate change especially in urban areas.
- Establish and provide solar system and mini-grids to provide electricity in emergency situation.
- Provide energy efficient cooking stoves to the rural woman.
- Provide solar pumps to the famers for irrigation during emergency.
- In order to adapt increased level of salinity, farmers may be trained to switch into different varieties, For example: converting rice to fish production, practicing crop rotation e.t.c.
- Rights of displaced person due to climatic change should be ensured. Recognition and protection should also be ensured to the climate induced migration.

- Health care system to be developed and ensured to the vulnerable people.
- Knowledge sharing and awareness of climate change adaptation should be raised across the society.
- A comprehensive data should be collected of the riverine households. Accordingly, target group should be identified.
- The rainfall and temperature data of various climatic events to be collected by Bangladesh meteorological Department (BMD).

Conclusion

Bangladesh is severely vulnerable to climate change. Climate change has a great negative impact. Every year, thirty to seventy percent of the country is inundated by flood. Coastal area are mostly inundated by flood. Coastal inundation and saline intrusion causes a susceptible damage to the coastal inhabitants. Due to sudden change of climate the storms and cyclones have increased. Climate change also has an effect on country's economy. A comprehensive national policy can reduce the vulnerability. At the same time, formulating disaster management plan can reduce the effect.

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