

*Full Length Research Paper*

# Impact of climate change in Bangladesh: Role of two governments

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**Bangladesh is a very low energy consuming country; it is pursuing a low carbon growth path, while building its resilience to climate change, and reducing the risk of climate change, which represents national development. Bangladesh is one of the top 10 nations; mostly vulnerable to climate change and by the end of the century, Bangladesh is set to disappear under the waves. Both Bangladesh and India are parties to the convention that obliges them to maintain natural water flow in river catchment areas to conserve regional ecology and biodiversity. There are many Transboundary Rivers and ecological issues between Bangladesh and India that needs to be resolved. India, being the neighboring country, will also be affected, if the ecology and economy of Bangladesh collapses under the weight of climate and environmental crises. It is therefore in the interest of both India and Bangladesh to work together in directions that will enable Bangladesh to withstand the climate and economic challenges that it faces. Bangladesh and India should take into consideration during their discussions and reach ecology-friendly, win-win solutions, which are common ecological issues. Both the nations should be united in the campaign for protection of the nature, ecology, and environment.**

**Key words:** Poverty, population, migration, government's integrity.

## INTRODUCTION

Massive level of human tragedies and public health threats from climate in recent years have created global awareness that climate change response and adaptation strategies are critical for national and international socio-economic, health and security. There are vital needs for sharing of strategies and technique to assist humans adapt to new conditions, while reducing their impact on earth, and to predict and prepare for climate change related crises. It also widely recognized that managing and reducing the risks associated with climate change will require inputs from all sectors of government and civil society, collaboration between many academic disciplines, and now ways of international cooperation that have hitherto eluded us. In this context, transforming research findings and lessons learnt into knowledge of adaptations planning and policy development that can be

shared with the global community are crucial and timely (Griffith University, 2012).

Climate change is the biggest global health threat of the 21st century and increasingly recognized as a public health priority (WHO, 2008; Lancet, 2011, Young et al., 2002; Yongyut et al., 2009). Human induced climate change threatens ecosystems and human health on a global scale (IUCH, 2010). Climate change will have its greatest impact on those countries, which are already the poorest in the world, and it will deepen inequities, and the effects of global warning will shape the future of health among all peoples. Nevertheless this message has failed to communicate most public discussion about the climate change (The Lancet, 2011). During this century, earth's average surface temperature rises are likely to surpass the safe threshold of 2°C above preindustrial average

temperature. Temperature rise will be greater at higher latitudes, with medium-risk scenarios predicting 2 to 3°C rise by 2090, and 4 to 5°C rise in Northern Canada, Greenland, and Siberia (Costello, et al., 2011). An update on the Intergovernmental Panel on Climate Change (IPCC's) fourth assessment identified that if there is no action to cut emissions, there is a potential for a temperature rise as much as 7°C by 2100. The fourth assessment report of the IPCC in 2007 also concluded that it was "unequivocal" that the Earth is warming and that human activities play a role in this change (New Nation, 2011a).

Climate change is taking a toll on not only the ecology of nations around the world, but also their political, economic and social stability, with the poorest nations and the poorest of the rich nations being the worst sufferers (Daily Star, 2010). A one meter rise in sea level could, for instance, flood seventeen per cent of Bangladesh's land area; threaten large parts of coastal cities such as Lagos, Cape Town and elsewhere and overwhelm, along with storm surges; small Island developing States from the Maldives to Tuvalu. A World Bank study has estimated that a one-meter sea-level rise would affect 84 developing countries alone. Recent studies have found that up to twelve per cent of the world gross domestic product (GDP) is already at risk from existing climate patterns. For example, the value of GDP exposed to tropical cyclones alone more than tripled from US\$525.7 billion in the 1970s to US\$1.6 trillion in the first decade of the 2000s (New Nation, 2011a).

The Global Sustainability Panel, recently set up by UN Secretary General Ban Ki-moon, is an attempt to bring a holistic approach to bear on issues, such as climate change, food, and water security, and development. However, it is has been felt that sufficient experience is lacking with how to connect dots, how to bring together concepts like climate change, and poverty eradication, climate change, and food security, and climate change, and access to water. Ultimately, if climate change is not being solved, then poverty eradication, food security, access to water cannot be solved either (Global Change, 2011). Secretary-General of UN, Ban Ki-moon affirmed that climate change was an "unholy brew" that could create perilous security vacuums, and that we must address a clear danger that not only exacerbated the threats but was itself a threat to international peace and security (Daily Star, 2011k).

### **Current situation**

Firstly, there is a massive gap in information, an astonishing lack of knowledge about how we should respond to the negative health effects of climate change. Secondly, since the effects of climate change will hit the poor hardest, an immense task before us to address the inadequacies of health systems to protect people in coun-

tries most at risk. Thirdly, technologies do have the potential to help us adapt to changes in climate. But these technologies have to be developed out of greater research investments into climate change science, better understanding about how to deliver those technologies in the field and more complete appreciation of the social and cultural dimension into, which those technologies might be implanted. Fourthly challenge is political creating the conditions for low carbon living. And finally there is the question of how we adapt our intuitions to make climate change the priority it needs to be (The Lancet, 2011).

International cooperation is essential to face the challenges of global warming. Various development players in Bangladesh need to aid them in communicating successfully. South Asian Association of Regional Cooperation (SAARC) is also important and could be more effective for its geopolitical relationship with surrounding countries and emerge as regional strength.

However, The Bangladeshi government is taking the problem seriously, Bangladesh government has started taking measures to dredge major rivers, increase green belts in coastal areas and fortify embankments to cope with the rising sea level (Daily Star, 2009b). Recently, environmentalists and experts called for integrating natural resource management, conservation, and climate change into national planning and budgeting to ensure sustainable development in Bangladesh. They also underscored the need for improving environmental governance alongside launching sensitisation campaign among policymakers and mass people so that best practices and success stories can be replicated and scaled up across the country (Daily Star, 2011m).

### **Bangladesh**

Geographically, Bangladesh is located in the tropical region (FAO, 2011). Natural disaster is a common phenomenon and till today Bangladesh is facing several disasters, and climate change is the main reason behind it (Daily Star, 2011a). Bangladesh is a country with great geographical vulnerability, with 70% of the population living in regions at risk of floods and 26% in regions at risk of cyclones. Not only is Bangladesh plagued with natural disasters, its population density makes it especially vulnerable to high rates of mortality and morbidity. With regard to the effect of natural disasters in South Asia in the 1960s to 1980s, Bangladesh had fewer events than either India or Indonesia, but had the highest overall mortality (Cash, 2013).

Bangladesh lies on a deltaic plain with five major river systems: the Jamuna-Brahmaputra; the Padma-Ganges; the Surma-Meghna; the Padma-Meghna; and the Karnaphuli. Although altitudes up to 105 m above sea level occur in the northern part of the plain, most elevations

are less than 10 m above sea level; elevations decrease in the coastal south, where the terrain is generally at sea level. These geographical features make Bangladesh vulnerable to natural disasters, such as floods and cyclones, and the high levels of poverty increase the enormity of the challenges that the country is likely to face from climate change (ICDDR,B, 2011a) (Figure 1).

## Population

The country's population now stands at 16 crore (Daily Star, 2011j), which is 1.8 crore more than a decade ago—leave behind almost unimaginable ecological footprints. Bangladesh is the third most populated country in South-East Asia after India and Pakistan, which have 121.45 crore and 18.48 crore people, according to United Nations Population Fund. Its population now is higher than the combined total of Thailand, Myanmar, Sri Lanka and Singapore.

## METHODOLOGY

Information was retrieved from documents available mainly in electronic database, and on the websites of specialized agencies, using the terms 'Climate Change', and 'Bangladesh' with other researchers work was undertaken, including four leading Bangladesh daily newspapers also analyzed. Thirty five (35) documents were retrieved from the database (websites) of several national, and international agencies were browsed. The most important being online collection from different journals on climate change related issues. These sites housed a number of reports on quantitative and qualitative studies, estimates of climate change cases, policy analysis of the existing climate change—situation and reducing the vulnerability due to climate change in Bangladesh and government strategies as well as role of neighboring countries, such as India.

This paper also looked deeper at the sectoral issues and policy. The paper tried to contribute to the existing literature, in the form of new findings and in the form of critical interpretation of existing ones. Histological observations were carried out and a cross-sectional prevalence study of climate change and Bangladesh was also held. A scrutiny of the abstract revealed that some presentation posted on the websites, which was presented in international conferences and few other presentations were published in journals. Collected documents were skim read to cases, whether they contained information on Bangladesh in conjunction with climate change.

## RESULTS

### Dealing with climate change

More than 259 extreme natural events hit Bangladesh during the period 1991 to 2009. More than 80% of the deaths occurred in 1991 in Bangladesh. In 1991, a total of 140,000 people died in Bangladesh and the number significantly fall in next year's, which can be seen as partial evidence, which is possible to better prepare for climate threat and prevent larger scale impacts from

catastrophe (Daily Star, 2010a). Since 1970, according to a statistics, about 39 million people have been displaced by major natural calamities like flood and cyclone in the country till 2009. Experts warn that about 6 to 8 million more people of Bangladesh could be displaced due to increase in global temperature and sea-level rise by 2050 (Daily Star, 2011).

Bangladesh is one of the top 10 nations mostly vulnerable to climate change, said German watch Global Climate Risk Index (CRI)-2011 report. By the end of the century, Bangladesh is set to disappear under the waves as mentioned by US government's NASA space agency. The International Panel on Climate Change (IPCC) predicted that by 2050, Bangladesh is on course to lose 17% of its land and 30% of its food production and as a result poverty will increase (Planetizen, 2008; The Independent, 2008). The country has already begun to feel the effects of the climate change as flood periods have become longer and the cyclones, droughts and earth quakes that hit the country cause greater devastation and adversely affecting the country's agriculture and land, and challenging water resources, occupational dislocations, food, health, energy and urban planning (Chimalaya, 2011).

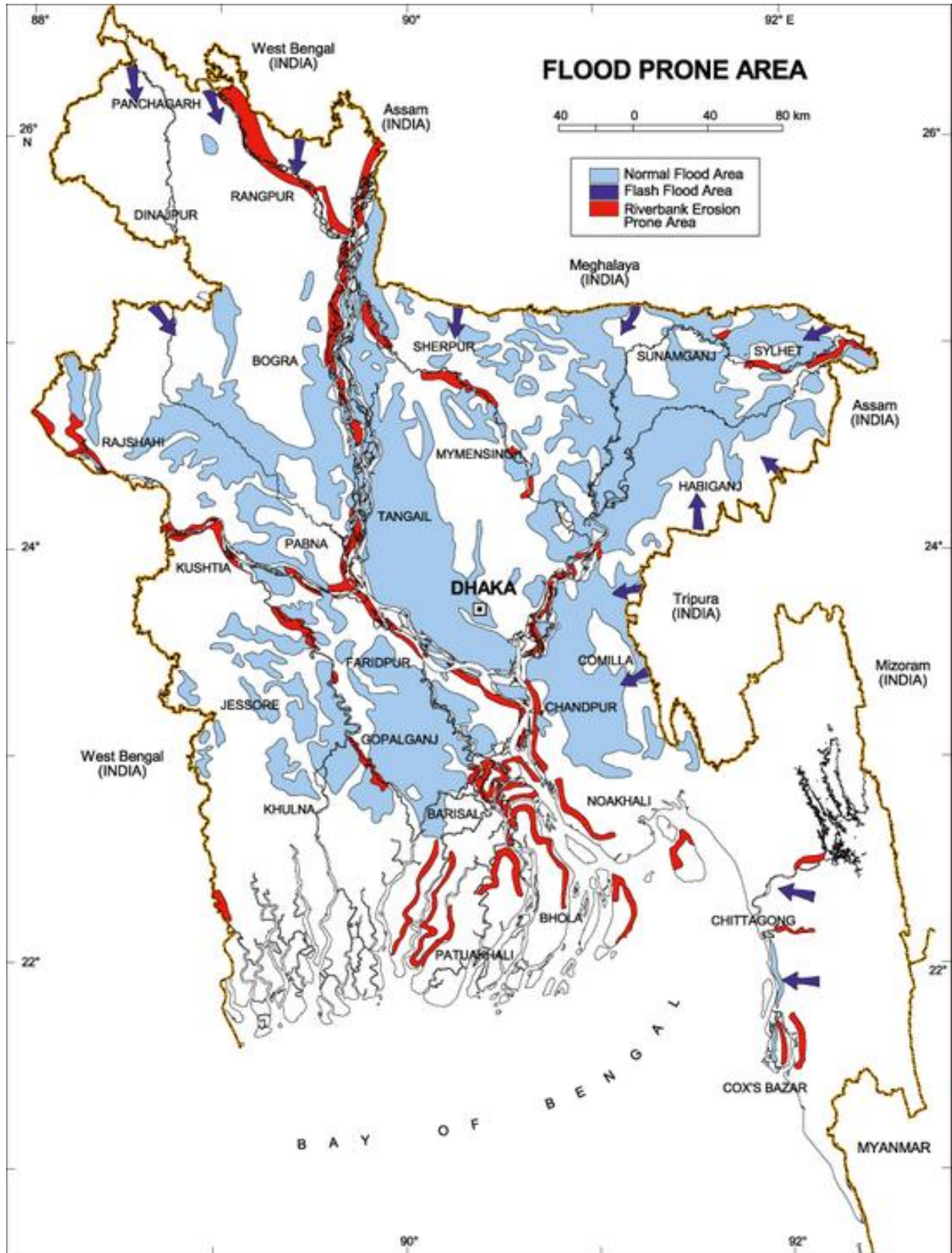
The Healthy Center for Climate Prediction and Research (HCCPR) estimates that sea level in Bangladesh will rise about 40 cm (15 inches) by 2080 (Streatfield, 2008). Water level rises by at least 5.6 mm a year at *Hiron* point, 1.4 mm at Cox's Bazar and 2.9 mm at Khepupara, which was cited 2008 data from Bangladesh Water Development Board (ANN, 2010). The climate models suggest that temperature will increase in Bangladesh during all seasons by approximately 1.0 to 15°C by 2030 (Kafiluddin, 2005). The Prime Minister of Bangladesh referred to the more extreme estimations that a 1 m rise in the sea level would submerge a quarter of Bangladesh's land mass (News Today, 2011).

### Disappearance of Sundarban, the Bengal tiger and birds

It was mentioned that the mangrove forests of the Sundarbans, the Bengal tiger and hundreds of bird species may disappear (Daily Star, 2011). Bangladesh and India shares important and sensitive ecological treasures, such as the mangrove forests of Sundarban and hill forests on Bangladesh's North and Eastern border.

These forests are rich in bio-diversity and they are also the areas, where members of many ethnic minorities live. It is the joint responsibility of India and Bangladesh to preserve and cherish these ecological treasures and to protect the rights of the ethnic minorities, who have been traditionally living there (New Age, 2011c)

Decreasing flow of water through the rivers from upstream is destroying the ecosystem of Sundarban. Experts from home and abroad observed that alarming



**Figure 1.** The above image is of areas of Bangladesh and their vulnerability to flooding. Source: [http://www.banglapedia.org/httpdocs/Maps/MF\\_0103A.GIF](http://www.banglapedia.org/httpdocs/Maps/MF_0103A.GIF)

decrease in water flow down the rivers caused high salinity in both water and soil of Sundarban, causing a massive change in faunal composition of the forest. Sundarban, which lies across the outer deltas of the Ganges, Brahmaputra and Meghna rivers, is the largest mangrove forest in the world. The number of timber producing big trees such as Sundari is decreasing at the proportionate rate at the increase of salinity,' Abstract from a paper on 'Biodiversity and its Conservation in Sundarban Mangrove Ecosystem' by Indian scholars Brij Gopal and Malavika Chauhan published in the Aquatic Science journal also revealed the same result. (New Age, 2011d)

The latest report of World Conservation Monitoring warned that a long-term ecological change is taking place in Sundarban due to the eastward migration of the Ganges, abandonment of some distributaries and past diversion of water and withdrawals for irrigation (New Age, 2011d).

### Changes on sea level rise

In the 21st century, climate change is expected to increase the risk of more recurrent and severe floods through higher river flows, resulting from heavier and more unpredictable rainfall in the Ganges-Brahmaputra-Meghna system during the monsoon and increased melting of the Himalayan glaciers. Its physiography and river morphology also contribute to recurring disasters. International Federation of the Red Cross and Red Crescent Societies in 2000 identified river erosion as the largest concern for Bangladesh (New Age, 2011e).

Extensive scientific research reveals that the earth's freshwater is among the first and most depleted resources impacted by climate change. The IPCC (2007), reports that groundwater, crop soils and many rivers are likely to become increasingly saline from higher tidal waves and storm surges as a result of climate change effects. Bangladesh's salinity intrusion threatens greater future incursion, for numerous reasons contentiously debated by scientists. These include reduced freshwater flows into the *Padma* River caused by the Farakka Barrage; climate change induced decreases of dry season rainfall, stronger and more frequent cyclones and sea-level rise; and intensified saltwater shrimp farming (Daily Star, 2011b). The consequent salinity will affect crops and require shifts to alternative land use (Streatfield, 2008).

### Migration to India

Migration taps into deep anxieties, including demographic change and increased competition over limited natural resource like water and land. India has already started to experience the impacts of climate-induced migration from Bangladesh. The likely outcome will be to split the economies of Indian and Bangladeshi Border States, with

flow-on effects for places at a higher elevation, given the unpreparedness of both these countries.

It is therefore immensely important for both countries to work together to handle migration and to manage their 4,097 km long border. India also needs to be proactive in initiating the Joint Climate Change Mitigation Forum, which could help Bangladesh and its citizens with mitigation and adaptation measures. This is crucial for India, because dealing with such a massive influx of people into its own territory will be an enormous challenge (East Asia Forum, 2013).

### DISCUSSION

Journalists have an important role in spreading the right message on climate change issues among others. A new advocacy and public health movement is needed urgently to bring together governments, international agencies, non-governmental organization (NGOs), communities, and academics from all disciplines to adapt to the effects of climate change on health (Costello et al., 2011).

In addition to that it is the duty of the agronomists to help the farmers at field level and guide the policy-makers to achieve the desired yield of crops (ANN, 2010a). Moreover, all types of possible anti Natural Catastrophe steps should be taken *now* by the government (Daily Star, 2010a). The recent establish 'climate change unit' under environment and forest ministry need to be made pro active. The bilateral treaty between India and Bangladesh, it did not address the issue of water diversion by India in the upstream areas (Daily star, 2011h).

Regional conferences are necessary as this can be a platform to reach a bigger audience. Referring to very little information available for the government, civil society members and experts of Bangladesh, sharing environmental/ecological data among the bordering countries is very necessary as this is a question of life and death for the people (Daily star, 2011h).

Instead of treating migration simply as a threat, and viewing it from a narrow security perspective, India should explore the possibility of collaborating with Bangladesh to address future climate-induced migration. Collaboration could take the form of a joint mechanism to deal with different kinds of migration, with a special focus on establishing combined disaster management groups to deal with climate change problems at their source. This could be accomplished by implementing innovative adaptation mechanisms in Bangladesh itself (East Asia Forum, 2013).

### Conclusion

We need to create scope for joint projects (both from India and Bangladesh) on scientific research on tigers and the Sundarbans ecosystem. However, recent agreement on biodiversity says none of the two countries

will do anything that may have an adverse impact on biodiversity and ecosystem, which is one of the main obligations of the Convention on Biological Diversity, 1992. Both Bangladesh and India are parties to the convention that obliges them to maintain natural water flow in river catchment areas to conserve regional ecology and biodiversity (Daily Star, 2011m).

There are many transboundary rivers and ecological issues between Bangladesh and India needs to resolve. There is no doubt that, India, being the neighboring country, will also be affected if the ecology and economy of Bangladesh collapses under the weight of climate and environmental crises. It is therefore in the interest of both India and Bangladesh to work together in directions that will enable Bangladesh to withstand the climate and economic challenges that it faces. Bangladesh and India should take into consideration during their discussions and reach ecology-friendly, win-win solutions. Common ecological issues, such as 1) Farakka Barrage on the Ganges 2) Indian barrages on the River Teesta 3) *Tipaimukh* Dam on the River Barak 4) Interventions into the River Brahmaputra e) Indian river linking project 5) Cross border flush floods 6) Cross border pollution 7) Approaches to the rivers (New Age, 2011c)

It is imperative that India seeks to address the issue of migration from Bangladesh, by joining hands with the latter and ensuring economic development of the latter and not through knee jerk reactions like sealing the borders (East Asia Forum, 2013).

Bangladesh government should ensure proper water sharing with India. An integrated water management and development project on the Ganges, Brahmaputra and Meghna should be taken to resolve the water catastrophe of Bangladesh (New Age, 2011c). Former caretaker advisor believes that the government should press for the formation of a Teesta River Commission a la the Mekong River Commission (in Southeast Asia) for total basin management in light of the framework agreement. Advisor believes that when there will be a climate of goodwill in both sides, only then people will build connectivity for them across the region (New Age, 2011f). Nation should be united in the campaign for protection of the nature, ecology, and environment.

### Comments from climate change activist

Secretary General, Ban ki Moon warned the world leaders that Climate Change was **'to mobilize the political will and vision needed to reach an ambitious agreed outcome based on science at the UN climate talks in Copenhagen... there is little time left. The opportunity and responsibility to avoid catastrophic climate change is in your hands'** (New Age, 2011a).

"Globally, we are talking about the largest mass migration in human history," says Maj. Gen. (R) Muniruzzaman. "By 2050 millions of displaced people will overwhelm not just our limited land and resources but our

government, our institutions, and our borders" (Envoinfo, 2010).

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