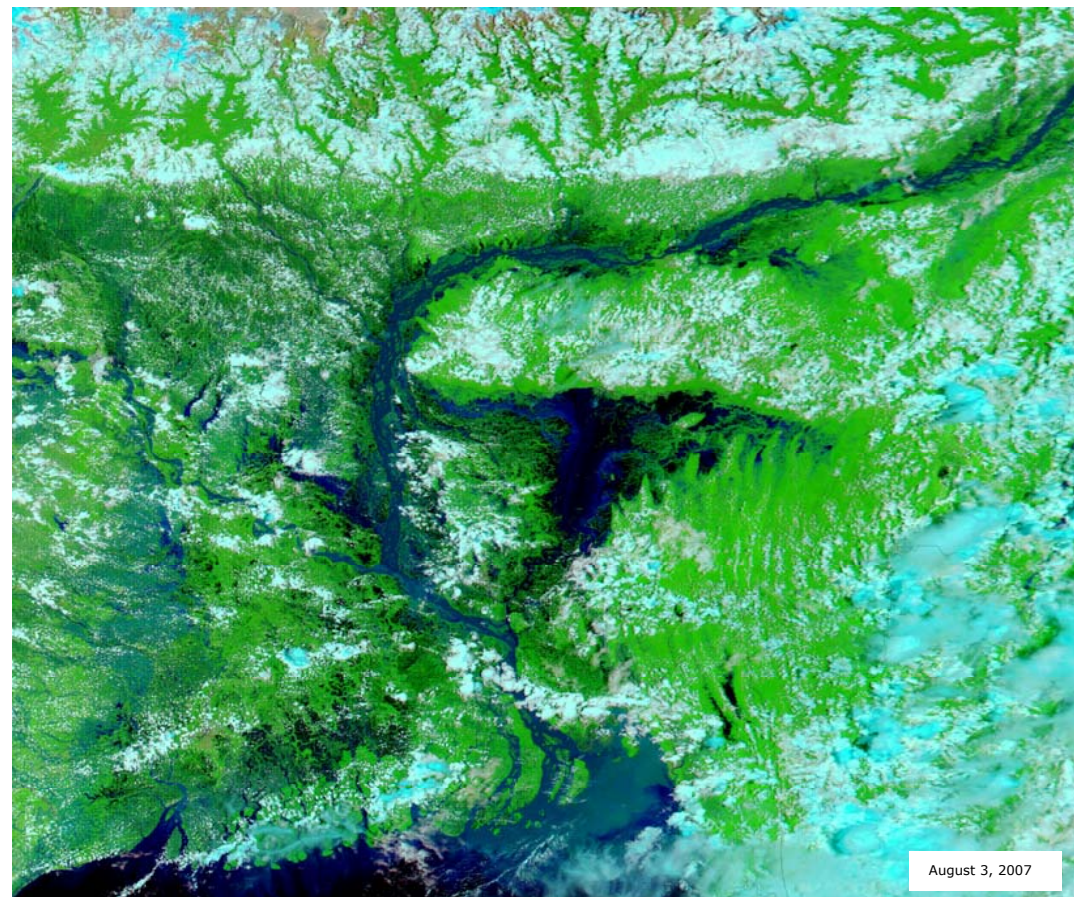
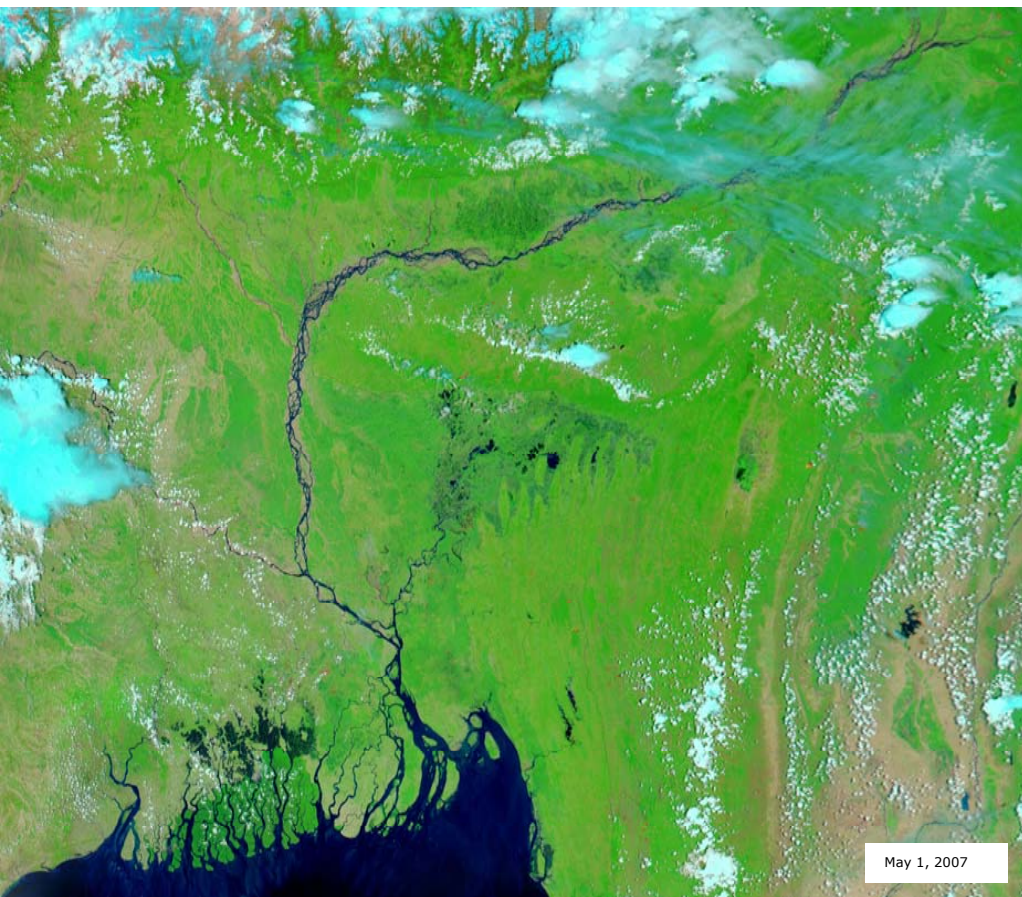




CLIMATE CHANGE AND BANGLADESH

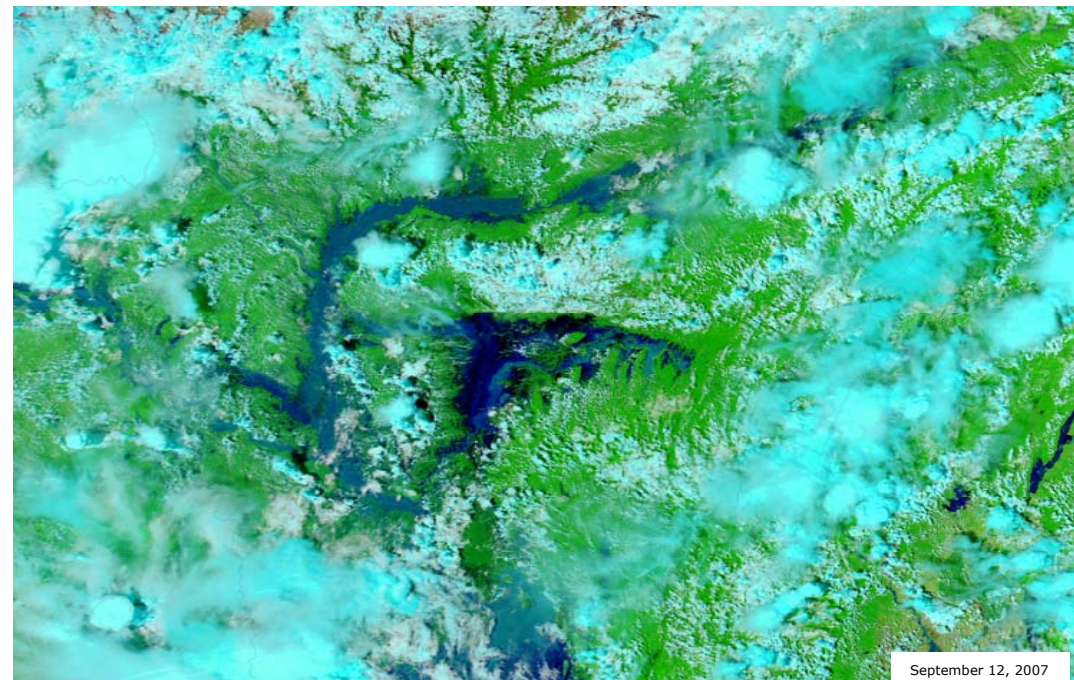


Floods maroon millions in Bangladesh

A large part of Bangladesh is an alluvial delta and therefore is extremely prone to flooding. In 2007, the monsoon in the upstream basin was particularly heavy, leading to a series of floods. Scientists have predicted more severe, extreme and recurring floods for the region which includes Bangladesh in the coming decades. This is alarming for a country already vulnerable due to population density, agrarian livelihoods and human settlements in the coast and along the mighty rivers.

India's Brahmaputra River was already flooded in early August (top right image), but those floods turned out to be small compared to the floods that hit the river in early September (bottom image). The river flooded for the third time in 2007 when monsoon rain pounded northeastern India, Bhutan, and Bangladesh in early September. As these images illustrate, the September floods were the worst of the year, forcing the Indian government to evacuate some 800,000 people from the banks of the river. An additional 500,000 people were evacuated downstream in Bangladesh. The floods damaged crops that had been replanted after the August floods.

Image Source: NASA, 2007, image courtesy the MODIS Rapid Response Team, NASA GSFC



Climate responds to global warming - Bangladesh faces the challenge

Rapid global warming has caused fundamental changes to our climate. No country and people know this better than Bangladesh, where millions of people are already suffering. Sudden, severe and catastrophic floods have intensified and taking place more frequently owing to increased rainfall in the monsoon. Over the last ten years, Bangladesh has been ravaged by floods of catastrophic proportion in 1998, 2004 and 2007. Heavy downpour over short spell has resulted in landslides. Cold spell claims human lives as well as damage crops. Droughts often affect even coastal districts. Bad weather keeps the coastal waters risky for fishing expeditions. Damages and losses due to climatic extremes like floods, cyclones, tornados, droughts are phenomenal to the victims as well as the state. These are early signs of global warming effects. Sea level rise in the coming decades will create over 25 million climate refugees. This is twice the entire population of the Netherlands.

Bangladesh is recognized worldwide as one of the countries most vulnerable to the impacts of global warming and climate change. 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, its resources and services. The country has a history of extreme climatic events claiming millions of lives and destroying past development gains. The people and social system have knowledge and experience of coping with their effects – to some degree and extent. Variability in rainfall pattern, combined with increased snow melt from the Himalayas, and temperature extremes are resulting in crop damage and failure, preventing farmers and those dependent from meaningful earning opportunities. In a changing climate the pattern of impacts are eroding our assets, investment and future. This stands for families, communities and the state. Global warming and climate change

threatens settlements and the number of people displaced from their land due to riverbank erosion, permanent inundation and sea level rise is increasing rapidly every year. Resource and effort of government and people are quickly drained addressing the impact of one event when another hazard strikes. Impacts of global warming and climate change have the potential to challenge our development efforts, human security and a future.

Bangladesh must move on in its pursuit to develop and strive as a nation, taking into account its vulnerability, susceptibility and capacity to manage climate risks and adaptation. In this respect, the government has taken bold steps to prepare and respond to the challenge already on us. To help the country and its people build necessary capacity and resilience, regional and international cooperation is essential. Major rivers that draws freshwater and sediment from upstream basin to the Bay of Bengal going through Bangladesh originate in neighboring countries and water flow during both summer and dry period is critical for agriculture and food and drinking water security. Collective actions are necessary now to understand risks and take actions. International efforts in planning responses to climate change must act urgently to avoid what is unmanageable and manage the unavoidable. The case of Bangladesh, one of the first and major victims of human induced global warming and climate change, should be taken seriously and addressed collectively.

Our hands hold our future. We must secure the well-being and development of Bangladesh by making the people and country resilient, through necessary resource and support, both internal and external. Together, we must address this challenge and demonstrate our environmental integrity to the human race.

Global Warming and Climate Change

Global warming is accelerating rapidly. Already, many countries, ecosystems and people are suffering from its impacts. Global warming has affected our weather patterns and disrupted our variability and trends in climate. This is resulting in an increase in climate related extreme events like heavy rainfall, flood, cyclone, storm surge, etc. These claim thousands of lives, destroy billions of dollar worth of properties, and disrupt livelihoods of hundreds of millions of people.

In 1991, the Intergovernmental Panel on Climate Change IPCC raised the alarm globally by presenting scientific findings on evidence of global warming, emission increase and climate change impacts. This resulted in a worldwide recognition that some serious actions are necessary to save our planet. In 1992 the UN Climate Convention led to the establishment of an inter-governmental process to identify and implement necessary response measures to curb global warming and address its negative impacts. The Convention led to the development of the Kyoto Protocol in 1997 which provides the mechanisms, targets and timetable for greenhouse gas emission reductions. To help vulnerable countries and people adapt to climate change and increase resilience, additional support was also agreed. Since then, ten years have passed. From an environment challenge, climate change emerged and established as a challenge to development, poverty reduction efforts, livelihood options, biodiversity, and human security. However, in terms of progress made in reducing greenhouse gas emissions, the report card is disappointing. Convention commitments to address current impacts and future risks from global warming through support for reducing vulnerability and adaptation measures is yet to materialize in a manner that will match current and future priorities. Funding through the creation of the Special Climate Change Fund (SCCF) and the Least Developed Countries Fund (LDCF) under the Convention has been fractions of the amount required as priority by the poorest and vulnerable countries. The Adaptation Fund under the Kyoto Protocol is yet to demonstrate its potential to mobilize financial resources to match priority investments to reduce vulnerability, adapt and increase resilience. For almost a decade or so, the negotiation process has been pursuing to include all major countries that may have a role with regard to a collective global effort.

The minimum standards for any future regime to curb global warming and respond effectively to climate impacts must include compensation for the victims, and resources to reduce vulnerability, adapt to or manage future risks

In 2006, Sir Nicholas Stern, in his review, Economics of Climate Change demonstrated that the cost of inaction now, in both greenhouse gas emissions reductions as well as adapting to climate change, will result in damages and losses of many proportion. Science has confirmed that the future impacts of global warming and climate change will have severe and far reaching consequences for today's generations and many more to follow. The IPCC also has confirmed this year in their report of the fourth assessment that global warming is accelerating rapidly, impacts are already evident, and urgent actions must take place now as projections clearly defines a roadmap of worsening impacts over the coming decades. The UN Climate Change Secretariat has recently made available a report which summarizes the financial requirements to support both adaptation and mitigation requirements over the next few decades. Sufficient and collective actions to combat global warming and climate change must take now, without further delay. Millions are already suffering. The poor of this world are already victims and will suffer most from unavoidable global warming and adverse future impacts. To prevent dangerous climate change, we must all address the interlinked challenge of energy for their sustainable development without adding more greenhouse gas to the atmosphere. Decisions will need to be taken now. How to prevent dangerous climate? Who should limit their emissions, how much, and by when? Who should bear the responsibility of those already affected or support those at risk to minimize losses? There may be no simple solutions, as the problems and concerns are quite complex. Our common future rests in the hands of our collective leadership and political decisions.

Responses to global warming and climate change must recognize our

Right to atmospheric commons

Right to sustainable development

Right to compensation by climate change victims

Right to protection from climatic impacts

Bangladesh and Climate Change

The impacts of global warming and climate change are worldwide. For Bangladesh they are most critical as large part of the population is chronically exposed and vulnerable to a range of natural hazards. Already, the human suffering and cost to development is massive to this country and its people who are victims of human induced global warming. Between 1991 and 2000, 93 major disasters were recorded in Bangladesh, resulting in nearly 200,000 deaths and causing US \$ 5.9 billion in damages with high losses in agriculture and infrastructure. Since then, the country is experiencing recurring floods frequently. The monsoon floods of this year are part of what the World Meteorological Organization sees as a global pattern of record extreme weather conditions. Climatic hazards, including extremes like floods, cyclones, tornado, storm surge, tidal bore, etc are not new to Bangladesh and the country has a scarred history claiming many lives and resulting in losses of assets, belongings. Some of the worst disasters in terms of mortality have taken place on this land. In Bangladesh during the past few decades, the effects of global warming have been evidenced in climate variability, change and extremes. More adverse impacts are projected for the coming decades, particularly for low lying coastline and floodplain ecosystems which characterize Bangladesh.

Impacts of climate change - the poorest are hit earliest and hardest

Poorer people are more susceptible to the destruction caused by hurricanes and flooding for a variety of reasons. The poor typically live in substandard housing that is more susceptible to damage from winds, heavy rain and floodwaters. Substandard or non-existent sewage facilities and lack of potable water in poor neighborhoods can result in greater exposure to water-borne diseases after flooding. Areas that are historically prone to flooding or mudslides are often inhabited by the poor.

To understand how global warming and climate change will impact Bangladesh in future, influence its development aspirations and chart its roadmap for sustainable development, three considerations are critical. The location of Bangladesh is in a deltaic plain of a major river basin, making it susceptible to floods and cyclones. The country is extremely populated in a small area, and one of the most densely populated in the world. The country is also very poor and a majority live below subsistence level, making them already vulnerable. According to the UNDP Human Development Report 2006, population living on income of less than one US Dollar a day is 36 percent while 82.8 percent of the population is living on income below two US Dollars a day.

Bangladesh scientists believe that because of sea level rise coastal Bangladesh has already experienced the worst impacts especially in terms of coastal inundation and erosion, saline intrusion, deforestation, loss of bio-diversity and agriculture, and large scale migration. About 830,000 million hectares of arable land is affected by varying degrees of soil salinity. During the period 1973-1987, about 2.18 million tons of rice was damaged due to drought and 2.38 million tons due to flood. Drought affects annually about 2.32 million hectares and 1.2 million hectares of cropped land during the Kharif (summer) (November to

Islands disappearing in the coast

Because of climate change, a sea level rise of 0.5 meter over the last 100 years has already eroded 65 percent landmass of 250 square kilometer Kutubdia, 227 square kilometers of Bhola and 180 square kilometer of Sandwip islands. Over the past 100 years, the once 1,000 square kilometer island into a small 21 square kilometer landmass. In case of any further sea level rise, islands like these and the entire coastal area would be hit hard resulting in billions of dollars of losses in GDP, economic downturn, ecological damage and livelihood assets and options.

June) and Rabi (winter) (July to October) seasons respectively, while soil salinity, water logging and acidification affect 3.05 million hectares, 0.7 million hectares and 0.6 million hectare of crop land, respectively in the country.

The temperature and rainfall projections for Bangladesh over the next decades show significant temperature increases for both monsoon and winter period. The projections for rainfall indicate more rains during monsoon and lesser during dry periods. Very small changes in the temperature, rainfall or sea level rise can lead to severe consequences for a country like Bangladesh already stressed environmentally, socially and economically. Also, the variations can be quite significant when downscaled for a location. In addition, there may be more than one impact at any given period which can lead to grave circumstances. Further, climate change induced impacts may trigger a chain of consequences due to non-climatic activities and their outcomes.

Understanding the Challenge

Global warming will continue for many decades, resulting in dangerous consequences for countries like Bangladesh unique in its vulnerability contexts. Impacts of climate variability, change and extreme events will lead to severe stress on overall development, environment and human society for generations ahead. Understanding the challenges over time is a primary and urgent need. Also, the challenges need to be explored from an inter-generational perspective. Ultimately, the better we understand, the better is our change to plan and respond to the challenge effectively.

Geographic Location The geographic location and geo-morphological conditions of Bangladesh have made the country one of the most vulnerable ones to climate change, particularly to Sea Level Rise. Bangladesh is situated at the interface of two different environments, with the Bay of Bengal to the south and the Himalayas to the north. This peculiar geography of Bangladesh causes not only life-giving monsoons but also catastrophic ravages of natural disasters, to which now are added climate change and SLR. The country has a very low and flat topography, except the northeast and southeast regions. About 10% of the country is hardly 1 meter above the mean sea level (MSL), and one-third is under tidal excursions. The country has 3 distinct coastal regions—namely, western, central, and eastern coastal zones

The western part, also known as the Ganges tidal plain, comprises the semi-active delta and is criss-crossed by numerous channels and creeks. The topography is very low and flat. The southwestern part of the region is covered by the largest mangrove forest of the world, popularly known as the Sundarbans, a declared World Heritage Site and home to the Royal Bengal Tiger. The mangrove forests act as deterrent to the ferocity of tropical cyclones and storm surges. The central region is the most active one, and continuous processes of accretion and erosion are going on here. The very active Meghna River estuary lies in the region. The combined flow of the three mighty rivers—the Ganges, the Brahmaputra, and the Meghna (commonly known as the GBM river system and ranks as one of the largest river systems in the world)—discharges under the name of Meghna into the northeastern corner of the Bay of Bengal. This estuarial region has seen the most disastrous effects of tropical cyclones and storm surges in the world and is very vulnerable to such calamities. The eastern region, being covered by hilly areas, is more stable, and it has one of the longest beaches in the world.

Economic Profile Bangladesh ranks low on just about all measures of economic development. This low level of development, combined with other factors such as its geography and climate, makes the country quite vulnerable to climate change. Bangladesh is a very densely populated country, where over 144.2 million people lives in a small area and with nearly three quarter of its population living in rural areas. Higher population density increases vulnerability to climate change because more people are exposed to risk and opportunities for migration within a country are limited. The per capita income in Bangladesh is US\$370. This ranks below average per capita income for South Asian countries as well as the per capita income for low income countries. More than a third of the people still lives in poverty; the majority of whom live in rural areas, risk prone locations and urban slums. About one-quarter of the country's GDP comes from agriculture, which makes the country's economy relatively sensitive to climate variability and change.

Social Status The majority of population is still dependent for income and livelihood on agriculture. In 2006, Bangladesh ranked 137th in the Human Development Index. Access to income and employment is limited, with a large service sector, a climate sensitive agriculture sector and industry. Access to drinking water is also insecure in some parts all year round due to saline intrusion in the coastal area, while in a large part of the country groundwater is contaminated with arsenic. The country also has to ensure health and education service to its nationals to deliver a future generation that can cope effectively in tomorrow's world. With 40 percent of the active workforce unemployed, livelihood options disappearing, and limited options to diversify earnings. The society has demonstrated its will and effort to respond to national emergencies, particularly those with regard to natural hazards like floods, tornado, landslide, cyclone, storm surge, cold spell, etc. However, frequent and uncertain weather conditions and extremes have eroded the household and community safety nets. Local and national governments struggle to reallocate development resources or access external resources to help people and economy recover.

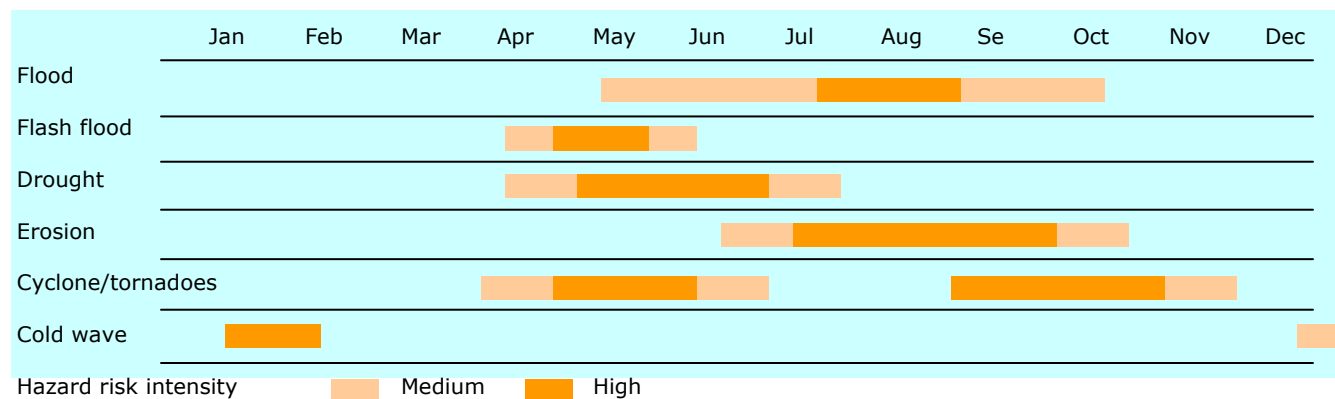
The rate of urbanization has been rapid in Dhaka, the capital as well as in other metropolitan areas in the country over the past few decades and has outpaced the facilities and infrastructure necessary to support and sustain the population. This is a direct consequence of lack of income and other livelihood opportunities in the rural areas as well as loss of property, home and access to natural assets due to natural hazards and their impacts. The number of families and villages who lose their homes permanently to rivers every year are perhaps one of the highest in Bangladesh. It has been reported that many of the slum dwellers in the metropolitan areas are the victims of riverbank erosion. In the decade of 1982 – 1992, over 106 thousand hectares of land has been eroded in the three major rivers of Bangladesh (the Ganges, the Brahmaputra and the Meghna) against an accretion of only 19 thousand hectares. Over 350 thousand people were displaced due to riverbank erosion in that decade alone, suffering severe economic and social consequences. Substantial numbers of communities are also being displaced from coastal islands, chars, and along the coastline as their settlements are destroyed due to frequent and intense storm surge and tidal bores.

Infrastructure

Infrastructure and facilities including road networks for transport, bridge and culverts, sea and airports, coastal and flood embankment for protection, industrial parks, public offices, public facilities including utilities, education, health centers, markets are all essential for a country to rapidly advance its people towards improved well being. Safe infrastructure ensures the development services and benefits it should provide and Bangladesh has been investing substantially to improve its physical infrastructure. Recurring severe to catastrophic floods have damaged and destroyed the physical infrastructure in many parts of the country making the protection weak and ailing.

Climate and Natural Hazards

Bangladesh has a humid, warm, tropical climate. Its climate is influenced primarily by monsoon and partly by pre-monsoon and post-monsoon circulations. A Climate Hazards Calendar showing key climate related hazard risks for Bangladesh is summarized in the diagram. The darker shade identify the period of year when the risk is most critical.



Global warming makes it worse

Over the last century the level of carbon dioxide has increased by 25 percent, the level of nitrous oxide by 19 percent and the level of methane by 100 percent. These are the three major global warming gases. Over the past 100 years (1906 – 2005), the earth's average surface temperature has risen by around 0.74°C, with the warming greater over land regions than over the oceans. The rate of warming averaged over the last 50 years is nearly twice the rate for the last 100 years. The late 1990s and the early 21st century have featured the warmest years since modern records began. A further warming of about 0.2°C is projected for each of the next two decades. Scientists say the world needs to cut emission of global warming gases by 50 to 70 percent just to stabilize the level of gases already in the atmosphere. However, emission of these gases are projected to continue rising in the coming decades. Scientists (IPCC, 2007) have projected that stabilizing atmospheric concentration of greenhouse gases responsible for accelerated global warming must happen as early as possible to prevent the temperature to rise at a level that triggers dangerous climate. A 2 degree Centigrade rise in the global mean temperature by the end of this century has been considered a possibility by many researchers and future scenarios of impact according to different increases in global mean temperature are now being produced illustrating effects and consequences in different parts of the world. However, very small changes in the temperature, rainfall or sea level rise can lead to severe consequences for a country already stressed environmentally, socially and economically. Also, the variations can be quite significant when downscaled for a location. In addition, there may be more than one impact at any given period which can lead to grave circumstances. Further, climate change induced impacts may trigger a chain of consequences due to non-climatic activities and their outcomes. For Bangladesh, a rise of global mean temperature by 0.74°C over one and half century has unleashed climatic nightmare putting survival and development in question. Global warming at 0.2°C per decade from now, unavoidable, will mean our struggle in this land will compound and reach challenging dimensions.

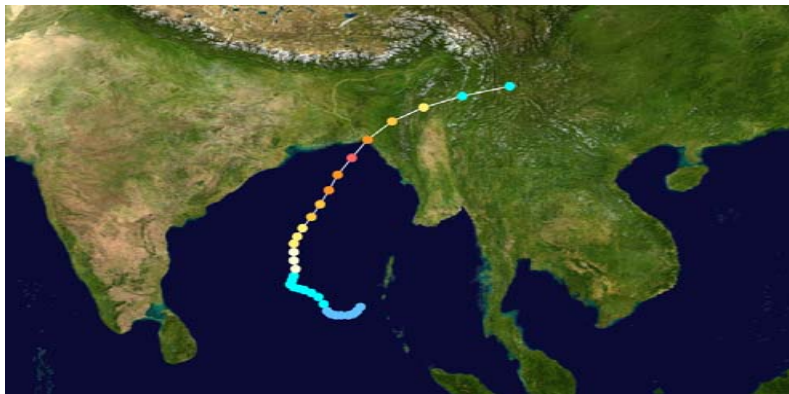
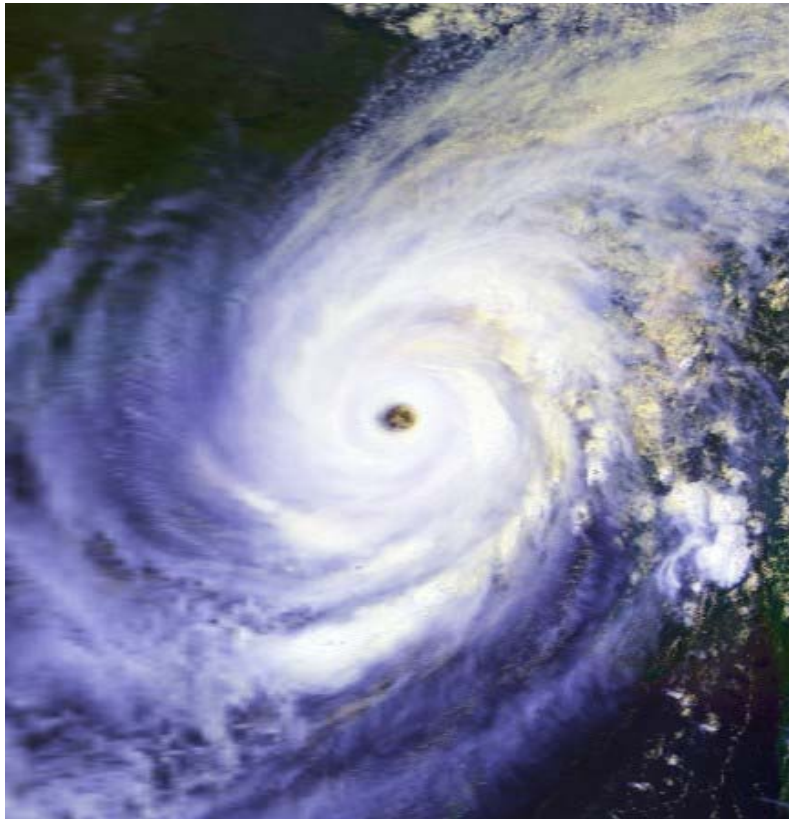
Observed changes in climate trends, variability and extreme events and their impact

Bangladesh is already evidencing the adverse impacts of global warming and climate change. The following impacts have been observed. 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 dengue, malaria, cholera and diarrhea, etc.

Climate change impacts are already adding significant stress to our physical and environmental resources, our human ability, and economic activities.

Impacts of observed changes are felt most in the following sectors:

- Water resources
- Coastal resources
- Agriculture
- Health
- Livelihoods
- Food security
- Habitat/settlement security



In April 1991, a cyclone struck Bangladesh, claiming lives and leaving destruction in its path. The satellite image on top shows the eye of the catastrophic storm. The bottom image describes the track, its increased intensity at land fall. The worst cyclone in recorded history on mortality count struck Bangladesh in November 1970. *Image source: NOAA*



Riverbank erosion is already displacing hundreds of family everyday in Bangladesh as their homestead is washed away and claimed by the river current.



The Sunderbans is the world's largest tropical mangrove forests, a World Heritage Site is already losing islands from climate change impacts including coastal erosion and sea level rise. The forest has a unique ecosystem and rich in biodiversity. It is home to the Royal Bengal Tiger among other unique life survives in this forest which also support livelihood of a substantial part of the neighboring districts. Massive loss of this forest is projected by IPCC during this century. The early signs are already felt as the area affected increases.

According to IPCC in their recently published Fourth Assessment, the following changes have been observed in climate trends, variability and extreme events

- In Bangladesh, average temperature has registered an increasing trend of about 1°C in May and 0.5°C in November during the 14 year period from 1985 to 1998.
- The annual mean rainfall exhibits increasing trends in Bangladesh. Decadal rain anomalies are above long term averages since 1960s.
- Serious and recurring floods have taken place during 2002, 2003, and 2004. Cyclones originating from the Bay of Bengal have been noted to decrease since 1970 but the intensity has increased.
- Frequency of monsoon depressions and cyclones formation in Bay of Bengal has increased.
- Water shortages has been attributed to rapid urbanization and industrialization, population growth and inefficient water use, which are aggravated by changing climate and its adverse impacts on demand, supply and water quality.
- Salt water from the Bay of Bengal is reported to have penetrated 100 km or more inland along tributary channels during the dry season.
- The precipitation decline and droughts has resulted in the drying up of wetlands and severe degradation of ecosystems.

A major concern for Bangladesh are climate change victims who are increasing in number every day and must seek refuge due to loss of their homes, land, settlement to river erosion, coastal erosion, and permanent inundation. It is alarming that there is no obligation for states to recognize the internal and external displacement of people due to climate change or other environmental factors. Four major types of victims due to effects of climate change on human settlement and habitat need to be highlighted. *Victims of riverbank erosion, coastal erosion, permanent inundation and sea level rise*

The number of families and villages who lose their homes permanently to rivers every year are perhaps one of the highest in Bangladesh. It has been reported that many of the slum dwellers in the metropolitan areas are the victims of riverbank erosion. In the decade of 1982 – 1992, over 106 thousand hectares of land has been eroded in the three major rivers of Bangladesh (the Ganges, the Brahmaputra and the Meghna) against an accretion of only 19 thousand hectares. About 350 thousands of people were displaced due to riverbank erosion in that decade, who suffered severe economic and social consequences (Khan, 2000). Substantial numbers are also being displaced from coastal islands, chars, and along the coastline as their settlements are destroyed due to frequent and intense storm surge and tidal bores.

Bangladesh – innocent victims of global warming

At 145 kilograms annually, Bangladesh has one of the lowest per capita emissions in the world. Yet a majority of its people, the economy and ecological space has already suffering due to global warming for which developed countries are primarily responsible. For Bangladesh global warming induced climate change over this century -

Threatens Development *Climate change and global warming triggers a host of effects with far reaching consequences for the already vulnerable nation and its people.*

Challenges poverty reduction *Past achievements, current efforts to break out of the poverty trap and pursue sustainable development aspirations are already confronted with climatic challenges.*

Questions human security *Permanent displacement from homes, settlements leading to out-migration has already led to a surge in squatters and slum dwellers who are physically, financially, psychologically and socially insecure. The rate of out-migration due to flood, river erosion, coastal erosion, permanent inundation already is alarming and holds the potential for development instability.*

Tomorrow's climate and risks

The IPCC Working Group II has reported in their fourth assessment this year that the production of rice and wheat might drop in Bangladesh by 8 percent and 32 percent respectively, by the year 2050. Bangladesh is especially susceptible to increasing salinity of their groundwater as well as surface water resources, especially along the coast, due to increases in sea level as a direct impact of global warming. With a 1m rise in sea level, the Sunderban mangrove forest is likely to be lost; Bangladesh would be worst affected by the sea level rise in terms of loss of land. Approximately 1000 square kilometers of cultivated land and sea product culturing area is likely to become salt marsh. Projected sea-level rise could flood the residence of millions of people living in the low lying areas such as in Bangladesh. Even under the most conservative scenario, sea level will be about 40 cm higher than today by the end of 21st century and this is projected to increase the annual number of people flooded in coastal populations from 13 million to 94 million worldwide. Almost 60 percent of this increase will occur along the coast in South Asia. The coastal lowlands below the elevation of 1,000-year storm surge are widely distributed in Bangladesh where millions of people live. Global burden (mortality and morbidity) of climate-change attributable diarrhea and malnutrition are already the largest in Bangladesh. The relative risks for these conditions for 2030 are expected to be also the largest. Bangladesh's population is expected to increase by 130 million more people over the next 50 years. Climatic changes in Bangladesh would likely exacerbate present environmental conditions that give rise to land degradation, shortfalls in food production, rural poverty and urban unrest. About 15,000 Himalayan glaciers form a unique reservoir which supports perennial rivers such as the Indus, Ganges and Brahmaputra which, in turn, are the lifeline of millions of people in Bangladesh. (IPCC, 2007)

A very high rate of sedimentation is predicted due to the increased flow in the rivers from increased rainfall in the upper catchment and from rapid melt of glaciers during summer in the next few decades. This will cause further erosion of the riverbanks, islands and coastal Bangladesh.

Climate change has the potential to undermine poverty reduction efforts and could compromise the Millennium Development Goals (MDGs), such as the eradication of extreme poverty and hunger by 2015. The OECD and the World Bank estimate that 40% of overseas development assistance to Bangladesh may be climate sensitive or at risk. Additionally, funding for humanitarian response to disasters (majority of which are climate related), which now cost donors millions of dollars per year, may result in the reallocation of funding from on-going development activities. This can set back the development process for decades.

Climate risks for Bangladesh

Environmental Impacts	Socio-economic Resources & Sectors affected
<ul style="list-style-type: none"> • Changes in rainfall patterns • Increased frequency and severity of: <ul style="list-style-type: none"> Floods Droughts Storms Heat waves • Changes in growing seasons and regions • Changes in water quality and quantity • Sea level rise • Glacial melt 	<ul style="list-style-type: none"> • Water resources • Agriculture and forestry • Food security • Human health • Infrastructure (e.g. transport) • Settlements: displacement of inhabitants and loss of livelihood • Coastal management • Industry and energy • Disaster response & recovery plans

Responding to the Challenge

Sustainable Development is understood as improvement in well-being of people, environment and economy. Development must ensure reducing the risks posed by climate change to people's lives and livelihoods. Development itself serves as a key to adaptation by enhancing resilience and increasing capacity to respond effectively to climatic challenges. On the other hand, adaptation is vital for development and progress and reduces costs of natural disasters. Ultimately, adaptation to climate change requires economy wide planning and regional cooperation. The links between development and adaptation has implications for official development assistance (ODA), both in terms of scale and focus. Equity warrants assistance from developed countries as main source of polluters who should compensate for the costs incurred to climate change victims in developing countries particularly the poor and already vulnerable suffering for what they are not responsible.

For Bangladesh, climate change is a serious long-term threat to development and achieving Millennium Development Goals.

Bangladesh must be a part of any future solution to climate change.

Bangladesh needs support to adapt and manage impacts as the cost will be huge.

National Response

The Government of Bangladesh considers climate change as a priority concern and is committed to take urgent and long term actions to reduce the vulnerability of its people and risks to national development. Recognizing the dimensions of the challenge, the government has taken steps for climate resilient development. The country is well set to address long-term measures in the national development planning and implementation process through relevant policy and institutional uptake. In this respect, the urgent task is to ensure the relevant policy makers and decision makers, development managers and professionals, local government authorities, research and academic institutions, development service providers and extension agents, development partners, etc., identify, integrate and address climate risks in their plans and actions. Very recently, a project addressing coastal afforestation from those listed as priorities for Bangladesh in the country NAPA has been approved by the GEF from the Convention LDC Fund.

A Climate Change Cell

To address current impacts and manage future risks of climate change and variability at all levels in all stages toward a climate resilient Bangladesh, the government has established the Climate Change Cell. The Cell provides the central focus for the Government's climate change related work, operating as a unit of the Department of Environment (DoE). Its objective is to enable the management of long term climate risks and uncertainties as an integral part of national development planning.

The Climate Change Cell has established a mechanism that facilitates management of long term climate risks and uncertainties as an integral part of national development planning. The Cell also facilitates strengthening the capacity of the professionals, practitioners, policy makers to reduce unacceptable risks and improve preparedness for climate change impacts.

Understanding climate risks

To understand climate impacts and risks, some key questions need to be answered: Will these hazards become more frequent and intense? Will their magnitude increase? Which locations are most vulnerable? When will hazards occur? And what shall be possible impacts? For example: A farmer would like to know the likely rainfall patterns while planning his crop calendar, preparing his land, sowing, harvesting, etc. Obviously the development practitioners, professionals and policy makers need to gather this knowledge to provide extension and other services to such primary stakeholders who are at risk.

Network sharing knowledge services Climate Change Cell collects, generates, archives and manages data, information and knowledge and provide support and services in making knowledge based decision to all stakeholders. A climate change database and a library archives not only data but also reports and study findings in the arena of the climate change. The website offers a pool of resources, including news on events at home and abroad, progress and achievements.

Adaptation research Climate Change Cell is facilitating key research actions to fill knowledge gaps in addressing adaptation to climate change and its impacts on the life and livelihoods; explore new adaptation options for the community to adapt with the impact of climate change; sharing experiences with relevant stakeholders on good practices for adaptation to climate change and variability. Through these research activities, a strong link between researchers, stakeholders and policy makers/planners has been establish to share research results and needs and to formulate viable adaptation policies/strategies at national level to act upon. The research would also provide good practices or technologies that have shown better potential for adaptation to climate change and variability as well as improved livelihood options in the backdrop of climate change impact.

Cost of impacts and investment needs for adaptation Climate change impacts can undermine countries' efforts to achieve the goals of sustainable development, including in particular by worsening poverty in developing countries, especially the Least Developed Countries like Bangladesh. Sustainable development depends on economic growth, social justification, and environmental integrity. Impacts in general and impacts due to climate change (and variability) on economic growth, social justice, and environmental integrity needs to be monetized to bring policy makers and planners on-board and provide them with an instrument that enables them in interpreting economical, social and environmental cost while planning development program. In this respect, the government seeks to assess the nature, size and spread of investment required in development plans and action to guide the country and its people toward climate resilience. Economic analysis and modeling for Bangladesh's vulnerability and susceptibility to climate change, disaggregated across sectors, could indicate investment requirements to protect past development gains and also assure climate resilient development in the coming decades. The

adaptation deficit for Bangladesh can contribute greatly to rationalize investment now to protect future.

Climate impact prediction Worldwide, climate impact prediction modeling provides useful scenarios of impacts of climate change in seeking answers to the questions, and to help prepare the vulnerable to respond to the challenge. The Cell is applying models to predict climate impact, hazard scenarios and impacts on livelihood following predicted climate scenarios. This will provide climate hazards and trends (past hazards) necessary to assess climate risks at this point in time and applied in disaster risk reduction initiatives in the country. Modeling outputs will also provide vital information on climatic hazards and risks at local level which will be used to initiate and manage disaster risk reduction and climate risk management. The hazards scenarios will also benefit development planning and management process towards climate resilient development.

Meteorological and hydrological information Systematic observations providing meteorological and hydrological information services are a precondition to estimate and forecast hazard risks and vulnerabilities. For Bangladesh, this is critical, as both climate variability and change are strongly evidenced. Weather patterns, seasonal variations are becoming increasingly erratic, hence uncertainty becoming the order of the day. Both amount and the timing of rainfall are vital information required for strategic decision making by a host of researchers, professionals, managers, development service providers, and most important, the practitioners on the ground, etc. Rainfall data is also essential and serves as important basis for hydrological data sets and requirements. The immediate and urgent priorities to ensure necessary hydro-meteorological information service are to obtain rainfall and water level data in the upper catchments of the major river GBM to give efficient and timely forecasts of flood, upgrade BMD radar systems and network to cover entire GBM catchment to obtain required precipitation data, use satellite data partially in real time basis for monitoring rainfall and flashfloods, networking between BMD and met stations outside the country, assess the impact of rainfall in catchments outside Bangladesh, prepare map on flood zoning, improve the flood information dissemination upto community level, and review the flood response system continuously.



Ask this landless woman with three children where to move as the river engulf their village



The communication network in Bangladesh depends much on roads like this all over the country. Floods damage these roads, making it difficult for people to carry on their activities until they are repaired again.

Managing climate risks

Building adaptive capacity to climate change and managing climate risks will be addressed through the mainstreaming of climate risk into sustainable development strategies. To do this successfully requires awareness and understanding of climate change issues. Specific adaptation actions take place at community or individual level. These actions should build on existing coping methods. Communication between communities will allow coping strategies to be shared.

Capacity building and promoting partnerships Climate Change Cell promotes partnership with both government and non-government agencies to service long term and immediate needs. In this respect, a total of 34 focal points have been established in different government agencies, academic institutes, research institutes and organizations. Government officers including the Focal Points have been provided orientation on climate change concerns and responses. The Climate Change Cell is inclusive and develops concepts, ideas, needs and frames with the partners by improving access to relevant knowledge timely and systematically. Research needs of each sector, good practice s in the sector, impacts of climate change and damage to the sector, risks to the sector, climate risk management and adaptation for the sector and priority investment for the sector can be identified and addressed through meaningful and effective partnerships.

Mainstreaming climate change into development plans and processes Mainstreaming climate change is to engage in a systematic, comprehensive effort to reduce the negative impacts of climate change through integration into overall national development and planning process of the country. The government has taken steps to facilitate achieving mainstreaming across all sectors and at every level of development. Some of the basic pre-requisites for mainstreaming are awareness, orientation, capacity building and advocacy at different levels and spheres of operation.

The mainstreaming process will emphasize on (a) coordination across institutions and tiers; (b) partnership among all stakeholders, including partnerships between agencies in charge of implementing development

programs and local beneficiary groups; and (c) integration of local plans into meso-scale plans, of meso-scale plans into macro-level plans, and of macro-level sectoral plans into national development plans. It will consider whether climate change would (a) put investment for development activities at additional risk; (b) could aggravate vulnerability directly or indirectly; and (c) could pose a threat to local level resilience in any perceived way etc.

Disaster risk reduction with climate change adaptation offers a win-win opportunity Climate system is fundamental for both issues: 75% of all disasters are originated by weather-climate extremes. Disaster risk reduction and adaptation to climate change strategies both are aimed at enhancing sustainability, resilient societies and human security. Similar sectoral focus, complexities & challenges, rely on same type of measures and policies. Disaster risk reduction offers opportunities for "bottom-up" strategies for adaptation to current climate variability and climate extremes. In this respect, disaster risk reduction can promote early adaptation to climate risks and impacts. The Comprehensive Disaster Management Programme (CDMP) of the government is piloting activities to integrate climate risks and adaptation needs with regard to extreme events into the comprehensive disaster management framework for Bangladesh. To promote links between disaster risk reduction and climate change adaptation, the government is raising awareness in both communities about the links between disaster risk reduction and adaptation to climate change and the need to integrate both in development plans, strengthening national institutions working in climate change, include disaster risk reduction and climate change experts in climate resilient planning processes linking development, disaster risk reduction and climate change, and identifying synergies to develop policies and activities that contribute to the reduction of risks and adaptation to climate change, specially in early warning system

A Country Framework for Climate Resilient Development

The government is currently developing a country framework to ensure national development is resilient to climate change and its impacts in such a way that the lives, livelihood and well being of its people is sustained over time. The objective of this country framework is to facilitate addressing climate risk management and adaptation holistically, practically and systematically in a country setting, thereby enabling development to take into account climate related risks and their management. It will chart a way for Bangladesh to integrate climate risk and adaptation practically. The framework will enable Bangladesh to assess and determine the scope and level of adaptation and risk management across different sectors on a continued basis, and over time, at each level of operation. This allows our country and its development process to address climate challenges holistically in its mainstream – a shift from ad-hoc, and segmented interventions.

The country framework will complement and support Bangladesh NAPA implementation. In fact, it may well be contemplated as one of the important means to address and overcome the barriers to mainstreaming identified in each country as they progress in their development pursuit. It will serve as a guide and assist professionals, practitioners and policy makers of our country by providing the 'How to' for mainstreaming, i.e., how to structure, design and develop these soft wares (knowledge management, social communication, institutional framework, etc.), defining risk environments, and responding to the same, as identified in the NAPAs. Using this country framework, the funds established through the Convention (LDC Fund, Special Climate Change Fund) and the Kyoto Protocol (Adaptation Fund) all could be drawn on and utilized to match resources required to operationalize mainstreaming climate risk and adaptation into development plans and processes. Donors and multilateral development institutions should mainstream and support adaptation across their assistance to Bangladesh. Over a mid to long term horizon, Bangladesh will be in a better position to identify and determine climate risks and adaptation measures within the scope of development plans and processes.

National Communications Article 12 of the Climate Change Convention requires all Parties to report on the steps they are taking to implement the Convention. In accordance with this article, the Conference of the Parties has elaborated several different types of reports and related guidelines and procedures consistent with the common but differentiated responsibilities of Parties. One such report is the National Communications, a periodic submissions by Parties not included in Annex I to the Convention on all aspects of implementation. As a part of the reporting commitment to the UNFCCC, Bangladesh has prepared its Initial National Communication (INC) and submitted to UNFCCC in 2002, and the process to prepare the Second National Communication (SNC) has been initiated recently.

National Adaptation Programmes of Action As an outcome of the climate change convention, National Adaptation Programmes of Action (NAPAs) provide a process for Least Developed Countries to identify priority activities that respond to their urgent and immediate needs with regard to adaptation to climate change. Bangladesh was among the first countries to prepare and submit its NAPA with the UNFCCC Secretariat in November 2005. The Climate Change Cell has a mandate to continue the NAPA process and facilitate implementation of NAPA. Some of the projects proposed in NAPA need to start without delay to provide vital feedback to the relevant implementing agencies and potential donors for long term planning. Adaptation Measures as Prioritized in Bangladesh NAPA are as follows:

Adaptation Measures as Prioritized in Bangladesh NAPA

Intervention measures

- Promoting adaptation to coastal crop agriculture to combat salinity intrusion through maize production under Wet Bed No-tillage Method and *Sorjan* systems of cropping in tidally flooded agro-ecosystem.
- Adaptation to agriculture systems in areas prone to enhanced flash flooding – North East and Central Region through no-tillage potato cultivation under water hyacinth mulch in wet sown condition, and vegetable cultivation on floating bed.
- Promoting adaptation to coastal fisheries through culture of salt tolerant fish especially in coastal areas of Bangladesh.
- Adaptation to fisheries in areas prone to enhanced flooding in North East and Central Region through adaptive and diversified fish culture practices.
- Construction of flood shelter, and information and assistance centre to cope with enhanced recurrent floods in major floodplains.
- Reduction of climate change hazards through coastal afforestation with community focus.
- Providing drinking water to coastal communities to combat enhanced salinity due to sea level rise.
- Enhancing resilience of urban infrastructure and industries to impacts of climate change including floods and cyclone.

Facilitating measures

- Capacity building for integrating Climate Change in planning, designing of infrastructure, conflict management and land-water zoning for water management institutions.
- Exploring options for insurance and other emergency preparedness measures to cope with enhanced climatic disasters (e. g. flood, cyclones and drought).
- Mainstreaming adaptation to climate change into policies and programmes in different sectors (focusing on disaster management, water, agriculture, health and industry).
- Inclusion of climate change issues in curriculum at secondary and tertiary educational institution.
- Climate change and adaptation information dissemination to vulnerable community to raise awareness.
- Promotion of research on drought, flood and saline tolerant varieties of crops to facilitate adaptation in future.
- Development of eco-specific adaptive knowledge (including indigenous knowledge) on adaptation to climate variability to enhance adaptive capacity for future climate change.

A national climate change policy and action plan To harness, guide and coordinate all the national and international responses and processes to integrate climate risk into development plans and processes, the government, through its Department of Environment has recently launched the preparation of the Climate Change Policy and Action Plan for Bangladesh. This Plan will take a holistic, inclusive and comprehensive approach involving all stakeholders toward understanding climate risks and vulnerabilities and then responding to these through concerned sectors, agencies and stakeholders. The Plan will address the needs and priorities of the country and will come into practice with mainstreaming climate risk management and adaptation using the country framework as an operational tool. This plan will facilitate policy makers to consider concerns specific to sectors, locations and levels of development activities and processes. Side by side the Climate Change Policy and Action Plan will facilitate coordination among the country's development partners to address necessary investments to make Bangladesh climate resilient. This plan is to be finalized by mid-2008, necessary actions are underway.

Unlocking the mitigation potential

Bangladesh has one of the lowest per capita CO₂ emissions in the world, and is not required by any international treaty or negotiation process to commit to any reduction targets or timelines. It is important to note that mitigation potential is substantial for Bangladesh, with a huge energy supply deficit which is expected to grow over the next decades. Hence the prospect of CDM looks bright with the country's commercial energy consumption increasing at 6% per year.

The government has a vital role to play in any Clean Development Mechanism project and has established the designated national authority. The main role of this national authority is to endorse Clean Development Mechanism projects by ensuring contribution to sustainable development of the country. Capacity building, both in government and the private sector, is necessary for obtaining funds from various international initiatives such as the Prototype Carbon Fund, the Community Development Carbon Fund and the Bio Carbon Fund.

Bangladesh needs to access low carbon energy to unlock its potential. The mitigation potential is substantial for Bangladesh, with a huge energy supply deficit which is expected to grow over the next decades. Reliable and affordable energy, including electricity is essential for economic growth and human development. Access to cleaner, non-fossil fuel energy can ease the balance of payment of an oil importing country like Bangladesh. With the country's commercial energy consumption increasing at 6% per year, prospects for CDM look promising.

Through the Clean Development Mechanism (CDM) greenhouse gas emissions can be reduced in three major sectors, waste, forests and energy. The waste sector options mainly prevent the release of methane from bio-methanation processes. The methane collected can be flared or used to generate electricity. When electricity is generated, the GHG reduction due to fossil fuel replacement can be claimed. When waste is converted to replace chemical fertilizer, GHG reduction can be claimed. The waste sector options for Bangladesh can be landfill, poultry waste, human waste and waste water treatment. Both afforestation and reforestation are potential options in the forestry sector. Options in the energy sector options for CDM are numerous.

Project from Bangladesh gets approval of the CDM Executive Board

The Designated National Authority (DNA) for CDM in Bangladesh has so far approved four projects in the Waste to Energy area. Out of these, the Landfill Gas Extraction and Utilization Project has obtained approval of the CDM Executive Board. Bangladesh has so far attracted US\$ 6.5 million, for 700 ton/day capacity compost plant in Dhaka. There is immediate potential to attract US\$ 93 million for urban areas. The project is expected to save 990,000 tons of greenhouse gas emissions over the period 2005-2012. Another project on Composting, which will save greenhouse gas emissions of about 4,87,000 tons is expected to get the approval of the CDM Executive Board shortly.

(Waste Concern, 2006)



As flood waters recede, a woman estimates damage to their homestead, property and cropland. For climate related extreme events like floods, this woman has no insurance to recover losses. She also has no idea why the floods are happening more and more frequently in recent years. The UN Climate Convention has agreed to assist and support the poor and vulnerable countries to reduce risks from climate related impacts and extremes. Compensation losses and damages for climate victims to help them recover their losses is also recognized in this agreement. Urgent action is required to assist these victims.



Rough weather in the rivers and the Bay of Bengal increase the risk of coastal fisherfolk communities. In the recent years, such conditions have prevented thousands like this fishing team to support their families as number of catching days during the fishing season falls. With little opportunity to diversify livelihoods, they are frontline victims of global warming. What social safety net can support them if their fishing nets remain idle?

Regional cooperation

Climate change is a development concern with severe implications in South Asia. All countries in the region are already affected by adverse climate impacts. The costs of extreme weather, including floods, droughts and storms, are already rising. Countries in the region need to prepare from now to manage what is unavoidable, and avoid the unmanageable. The South Asian countries, particularly the poorest in the countries, are already suffering from negative impacts due to extreme events and variability. Changes are already having major impacts on the South Asian economies and on the lives and livelihoods of millions of poor people. The impacts result not only from gradual changes in temperature and sea level but also, in particular, from increased climate variability and extremes, including more intense floods, droughts, and storms.

"The rise in sea level due to global warming is an(other) impending threat. We are also experiencing an alarming intrusion of salinity into our river channels. The lives and livelihood of our peoples are adversely affected because of these looming environmental crises. Bangladesh, therefore, urges immediate collective action and stronger regional cooperation for the conservation and utilization of our shared environment."

Dr. Fakhruddin Ahmed, Honorable Chief Adviser, Government of the People's Republic of Bangladesh, in his Statement at the Inaugural Session of the Fourteenth SAARC Summit, April 3, 2007

Climate impacts will affect the entire population in South Asia in the coming decades, in one form or the other. Hence there lies the need for a systematic recognition across sectors and countries. The stakeholder groups should further ensure identifying and assessing risks, and scope risk management and adaptation options. Adaptation to climate change requires taking steps to prepare and rationalize costs. Evidence and studies suggest, it is no longer possible to prevent the climate change in the coming decades, while it is still possible to protect the Societies and Economies from its impacts to some extent viz. by providing better information, improved planning and more climate-resilient crops and infrastructure. It is envisaged that adaptation costs will be substantial every year for the South Asian member states and could put strain already critical scarce resource base in the Region. For the South Asian Association for Regional Cooperation (SAARC), this could eventually constrain achieving many of other sectoral goals and objectives, namely the 22 SAARC Development Goals (SDGs), SAARC Social Charter, etc. Efforts to address sustainable development goals in every member state could therefore be increasingly challenged by climate variability and change.

At the 14th SAARC Summit in New Delhi during 3-4 April 2007, delegations expressed "deep concern" in this respect. As a follow up action, the Declaration called for identification of collective actions to pursue climate resilient development in South Asia. Bangladesh accordingly proposed to

Paragraph 13: Delhi Declaration of the 14th SAARC Summit

"The Heads of State or Governmentexpressed deep concern over global climate change and the consequent rise in sea level and its impact on the lives and livelihoods in the region. They emphasized the need for assessing and managing its risks and impacts. They called for adaptation of initiatives and programmes; cooperation in early forecasting, warning and monitoring; and sharing of knowledge on consequences of climate change for pursuing a climate resilient development in South Asia. They agreed to commission a team of regional experts to identify collective actions in this regard."

organize a Regional Workshop to identify collective concerns and priorities to engage in cooperative actions. Member states can benefit substantially from sharing, coordination and cooperation among members within our Association. Further, sharing of mutual concerns and options can play a vital role toward consensus building, leading to collective positions in international processes and multilateral agreements. The Workshop is scheduled in October 2007 hopes to *establish a regional platform* to address climate change issues and concerns, focusing on knowledge and information sharing, communication and coordination, impact and vulnerability assessment, risk management and adaptation to climate change; *initiate a process and mechanism within member countries to address climate change concerns collectively and develop a proposal for collective action* to address climate change concerns.

Global response and expectation

Adaptation to climate change is already an urgent priority for Bangladesh – as one of the poorest and most vulnerable countries. Reducing the risks posed by climate change to people’s lives and livelihoods and to national development processes is our top priority. Bangladesh and its people can become less vulnerable if sustainable development and other goals address and integrate climate risks. Adaptation to climate change and climate risk management should therefore be part of Bangladesh’s development planning. Developed countries who have obligations must ensure that adequate resources are available accessible in time to invest in sustainable development and also to make development resilient to negative impacts of the changing climate.

International support for adaptation to climate change is paramount since links between development and adaptation has implications for official development assistance, in scale as well as focus. Adaptation to climate change will add a massive burden to Bangladesh’s budgets and development assistance. In this regard, commitments made already to double international aid flows by 2010 must be delivered. Climate Change Negotiations provide a unique platform for the global community to come together and work towards protecting the global commons and ensuring a common future. It should be re-emphasized that the UNFCCC process and funds are essential to support capacity building, identifying and addressing urgent and immediate priorities.

Key expectation from the global community is that equity is ensured, justice delivered, and commitments are adequate and in time while compensating climate victims, climate refugees, and helping those vulnerable to cope with climate challenges. Climate risk management and adaptation is a survival as well as development concern. The international community should ensure an equitable regime that proactively applies “precautionary” and “no regrets” principles while funding adaptation needs and priorities.

Considering the global warming imperative, the impacts of global warming already taking place and their effects, the strong likelihood of future variability, trends and extreme events, our current vulnerability and capacity, Bangladesh calls for consensus and urgent action to support for the following

Adaptation considered as a development concern and priority Adverse climate impacts already have claimed hard earned development gains and benefits in many countries. Adaptation and management of climate risks must be integrated within each country’s development and planning process, at every level. The government, development partners and private sector will all need to mainstream climate risk management into their portfolio.

Apply both precautionary and no regrets principles support adaptation funding Investing in adaptation and climate risk management is not additional, but is essential to safeguard well-being and development gains. The likelihood of climate change related phenomena and events are too high to ignore. National and regional political instability may result from the outcome of adverse impacts if government fails to make development climate proof. Bangladesh is investing time and resources to scope, plan and initiate integration of climate risks and adaptation in its development planning framework and processes. Real need and demand for adaptation and risk management will then eventually surface from the development sector which can be addressed from convention and protocol funds as well as development support and cooperation.

Bangladesh showcases what will happen under climate change, and what many countries will need to do to protect ourselves in the years ahead.

Because of its poverty - over 80% of its population lives on less than US \$2 a day - Bangladesh cannot afford the kind of defenses planned in Europe, or even New Orleans. As a matter of fairness, adaptation measures in poor countries should be financed by rich countries. It is poor countries that are suffering the brunt of climate change but it is the rich countries' greenhouse-gas emissions that caused this problem in the first place. A number of development partners already are investing in Bangladesh to address climate risks and impacts.

Funding Adaptation Needs and Priorities Developing countries who are climate change victims have the right to compensation for damages as well as to prepare and reduce the risk through adaptation measures. Addressing development challenges including adaptation to impacts of climate change requires additional funds and resources. Innovative, practical, diversified, transparent, accountable and most of all legally binding mechanisms need to be established and governed equitably enforcing climate justice. Market mechanisms to curb emissions should all include substantial levy in the second commitment period if realistic funds are to be generated to invest adaptation needs and demands that is likely to surface in the coming decades. More luxury taxes could be introduced on lifestyle and consumption patterns that release greenhouse gas emissions threatening survival of the vulnerable most. The size of financial requirements will matter. But what matters more is the governance. Bangladesh hopes to continue its participation in future international agreement and frameworks to respond to climate challenges. The rule of common and differentiated responsibility should apply – emitters should own up and finance the cost of adaptation, victims and vulnerable should have right to decide how this fund should be managed and utilized.

Bangladesh, on behalf of its vulnerable people, and also as a voice for the vulnerable communities and countries all over the world establishes the case for global consensus and urgent action to address climate change considering the following:

Support rights of the poorest first An overwhelming majority of the poorest and most vulnerable are women, the physically and intellectually challenged, children, and old people. This make the case stronger to give specific attention to build women’s capacity by taking necessary steps locally, nationally and internationally.

Support rights to information and know how Real adaptation will take root with the poor and most vulnerable securing their access to necessary information, knowledge, services and resources timely, adequately, and in accordance to their needs. They must secure access to the right information to make decisions and build necessary resilience, in the most cost effective way.

Support climate justice Reducing vulnerability to climate change impacts *on the ground* can be realistically achieved once appropriate mechanisms, instruments and arrangements evolve, enabling those who are vulnerable to match their resource requirement with their felt needs and response strategies.

Support right to well being and development As responsible human beings, we must all envision and act our roles in securing a just, fair and equitable climate regime that support right to well being and development.

Our hands hold our future

International negotiations in the arena of climate change concentrates on future commitments. The immediate issues are

- Bringing the United States on board and persuade all responsible countries take on mitigation targets.
- Bringing large developing countries, for example, China and Brazil, to reduce their emissions.
- Ensuring that the principles of equity, right, justice and entitlement are integral to a future agreement

Bangladesh has a major stake in what future commitments the world agrees to. The fate of this country and people is directly linked to both mitigation and adaptation to climate change. For Bangladesh, *the core of the new deal the world agrees to must be that global emissions reduce as rapidly over the next few decades*, as anthropogenic emissions already released in the atmosphere has placed our country at high risk from unavoidable global warming and resulting climatic impacts to take place in the coming decades. The future aspirations of this country and its people are threatened. Bangladesh's future is very much in the hands of those responsible to ensure a meaningful outcome from negotiations. International and regional consensus and action has a key role in supporting global and regional public goods for adaptation such as forecasting climate and weather, disaster response, more resilient crop varieties, technologies for water conservation and irrigation, new methods to combat land degradation, prevention and treatment of malaria and other water and vector borne diseases.

Strengthening positions within existing groups such as the Least Developed Countries and vulnerable countries are absolutely essential for Bangladesh to secure necessary outcomes from the international negotiations. Bangladesh takes active lead and will continue to identify common concerns and opportunities with other governments, bi-lateral and multi-lateral institutions to prepare strategies for consensus building among wider groups.

Deeper emission reduction targets ensures climate equity, justice and integrity Those countries currently on track in addressing emission reduction targets for the first commitment period should serve as models of good practice in climate change mitigation. Countries lagging behind in achieving targeted reduction levels should face up to this challenge and put spirit in their will and decisions. Fast tracking to resolve this situation could be made possible through development, application, transfer of emission reducing know how and technologies to the developing world, making their development efforts more emission friendly and hence reducing overall global emissions over time. This would require the Kyoto mechanisms to be more flexible than that now, specially the Clean Development Mechanism CDM, in spirit and in its equitable distribution among developing country Parties.

An adequate and accountable future regime ensures achieving the targets Targeting and achieving deeper emission reductions from now on by Annex-1 countries will ultimately pave way to equitable participation by remaining countries as they shape their development pathway over the future. This will serve in addressing reduction of emissions more adequately in future. All Parties and their commitment to service humanity, life and progress through the negotiations by safeguarding the atmospheric common should strive in achieving this. Commitments must be realized effectively, timely to maintain integrity and spirit in any regime, and necessary to pursue consensus building on an adequate and accountable climate regime that secure the ultimate – stabilization of emissions below what many consider dangerous. In this respect, the governance of the present and future regime for mitigation emerges as a critical aspect.

Good governance in responses – the key to success Good governance of the climate regime and its negotiated outcomes will manifest Parties fully accountable for their role and commitment, to the needs of the real world, its people and the atmosphere that supports life on it. This will further ensure transparency in decision making, equitable participation and responsive disclosures. Meaningful and effective participation by all Parties in climate change mitigation will prevail by recognizing we have no alternative to that of taking action immediately, adequately. Ultimately the consequences of inactions will challenge the integrity of the global community in securing the right to be able to cope with climate impacts and maintain well being of life on this planet.



Water sustains life. Climate extreme events like flood will drown homes, properties and crops. Without water our survival is threatened. Land become useless as crops won't grow. Food in-security prevails, particularly among the already poor and drought affected regions. Scarcity of drinking water is already acute in many parts of the coastal area due to high saline contamination. All these challenges will compound for this country as rivers start to flow less and less in the dry seasons, while strong current from water rushing from upstream inundate cropland or claim riverbank erosion victims during monsoon.

Photo credit : Naymuzzaman Prince@ebonyNivory, 2007

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