



Environmental Security

Coping with climate change and climate security of Bangladesh

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Introduction

Climate change is becoming one of the most important human security issues of contemporary international arena. The security issue of climate change is multi-national in dimension, short term as well as long term. Although the causes of climate change are global in nature while the impacts are felt nationally, often multi-nationally. Bangladesh is predominantly becoming vulnerable country of high threat of climate change because of combined multidimensional stresses like environmental degradation, frequent flooding, drought, surface and ground water pollution, loss of bio-diversity and balanced ecosystem. Due to natural geographical location like low elevation of land areas, low inclining of rivers and proximity of the Bay of Bengal, Bangladesh is one of the most vulnerable country to the affects of climate change in its human security dimension. Since it is affecting the basic elements of the country's national life including food, shelter, water, health etc. – all the consequences have long term negative impact over the management of national infinite resources and enhancing the chances of social conflicts.

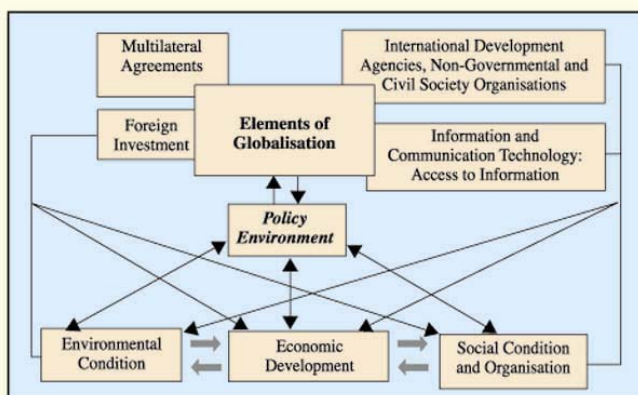
Environmental degradation and its associating affects on national development strategy have already caused countrywide severe uprooted migration problem especially in case of those who are now living in coastal belts. Since Bangladesh is a country of active delta in geographic nature, extreme flooding with frequent river erosion seriously affecting national development growth of every financial year. The negative impact of climate change on food security, health security, economic security, therefore, threatens the life of millions of people's of Bangladesh.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flooding												
Drought												
Erosion												
Cyclone												
High probability:	■			■								
Moderate probability:	■			■								

Source: WFP (2002b), citing RDRS data

Figure 1: Disaster Calendar for Bangladesh.

Our current existing socioeconomic complex web problems vis-a-vis traditional and nontraditional security threats indicate the fact that governmental and different non governmental agencies have important roles to play to count the threats of environmental challenges. Figure 2 shows that government and other institutional policy initiatives at the center, and connecting global processes to social, economic and environmental changes in Bangladesh. Linking the various dimensions of the problem, the GECSC research model encompassed: (1) the political economic forces underlying the policy context for foreign and local investment, production relations, and social relations; (2) environmental dynamics; (3) livelihood changes; and (4) organizational responses.¹



Source: Context and Trends of Globalisation in Bangladesh: Towards a critical Research Agenda by Matiur Rahman and Raymond Wiest quoted in Globalisation, Environmental Crisis and Social Change in Bangladesh ed. by Matiur Rahman, Dhaka, 2003, p.14.

Figure 2: Links among global processes and environmental, economic and social conditions in Bangladesh

It is apprehended that one meter sea level rise will inundate about 5,608 million acres of existing coastal land which is about 15 percent of the total area of Bangladesh. The area comprising of 65 percent of greater Khulna, 99 percent of Barisal, 100 percent of Patuakhali, 44 percent of Noakhali and 12 percent of Faridpur will be inundated and as a result, 13.74 percent of net cropped area and about 401,600 hectares of mangrove forest along with its wildlife will be vanished.²

The calamity of sea level rise will also have dramatic and traumatic repercussion on the socio-economic condition of the country.

- The already fast rising price of land will accelerate further. These may lead to further landlessness and accumulation of land resources in fewer hands.

- The differences between rich and poor will increase, resulting in social attrition.
- The present high density of population will further intensify. This may unnecessarily precipitate social unrest leading to anarchy, lawlessness and unemployment. All of the above will lead to an exploitation of the very fabrics of the nation.³

The analysis of the macroeconomic impact of floods in 2004 points out that the growth of per capita income is likely to fall from 4.5 percent to 3.7 percent due to income loss. The fall in per capita income may be more for the poor and the non-poor households that are very near the poverty threshold. An estimate of the non-poor household groups within 10 percent above the poverty line in the districts hit by floods in 2004 shows that they accounted for 4.3 million people in 2000. These people risk slipping into poverty unless they are protected under appropriate safety net programs.⁴

Recent experience of tropical cyclone 'Sidr' that hit Bangladesh in 2007 is that it affected the livelihoods of millions of people, caused death of more than 4000 people and loss of nearly 1.6 million acres of standing crops, poultry, fishery, livestock, horticulture and valuable flora and fauna of Sundarban.⁵

Environmental Refugee

The vulnerability of country's natural disasters like flood as well as cyclone have many folds of national comprehensive development program. Most of the poor peoples in Dhaka, engaged in day labor workers like rickshaw pullers, shoppers and even the beggars, are basically migrated people. They had previously involved in some sort of different professions like farming or catching fish. Because of natural calamities like river erosion, flood or cyclones etc. and consequently, due to their migration, they have not only changed their economic activities, but also to change their own home and identity. They are, in fact, better to term as "Environmental Refugee". Experts have already warned that if this trend continues, a country like Bangladesh will not be able to accommodate such a huge uprooted people in near future.

At present, millions of river eroded population have no permanent identity or shelter over their head due to poverty and resource constraints. Peoples are frequently migrating to urban areas and settling in urban slums. According to an official

source, the nation has a deficit of 3.5 million basic house units, out of which 2.3 million of these homeless families reside in the villages and 1.2 million in the urban areas.⁶

The preliminary findings from the 1996 agricultural census of Bangladesh shows that both the absolute and the relative proportion of the completely landless households have increased in the rural areas. Their absolute number has increased from 1.2 million in 1983-84 to 2.1 million in 1996.⁷

Before 1974, there was no city in Bangladesh that had a population of one million or more but now Dhaka emerged as a mega city with a population of around 10 million. Distribution of the urban population over the years reveals significant increases in the size of four major cities (Dhaka, Chittagong, Rajshahi and Khulna), particularly in recent years. In the first half of this century, they contained around a third of the total urban population and in 1991, about 50% of them lived in these cities. The level of urbanisation raised from a very low base (7.6%) in 1970 to 20% in the 1990s. The annual growth rate of urban population in Bangladesh during 1975-1995 was 3.4%, which is higher than that in the neighboring countries and in other largely populated countries of Asia.⁸

According to a survey conducted by Asian Development Bank (ADB) and Planning Commission, Government of Bangladesh (1995-96), 61.30 % of the urban population in Bangladesh falls below the absolute poverty line while 40.20 % falls below the hard core poverty line.⁹ In Dhaka alone, 54.85 % of the population are below the poverty line with 31.88 % below the hardcore poverty line.¹⁰

According to a newspaper report, 30 million people in the rural areas of Bangladesh have no roof over their heads. Every year, the cruel cycle of tornadoes, the rivers engulfing land and floods add 20 thousand more to this miserable flock.¹¹

Table 1: Major Natural Emergencies/Disasters in Bangladesh

Year	Type of Disaster	Affected location	Est. Number of deaths	Est. affected population	Est. Damage (US \$ million)
Nov/1970	Cyclone	Khulna, Patuakhali, Chittagong, Barisal,	300,000	3,648,000	86.4
July/1974	Flood & Famine	Nationwide	30,000	36,000,000	579.2
Aug/1980	Floods	Northwestern region	655	10,000,000	150.0
May/1984	Floods	Nation wide	1,200	30,000,000	600.0
Sep/1987	Floods	Nation wide	2,055	29,700,000	330.0
July/1988	Floods	Nation wide	2,379	45,000,000	2,137.0
Apr/1991	Cyclone	Coastal Area	138,868	13,400,000	1,780
July/1998	Floods	Nation wide	918	30,896,35	1,106.6

Source: Disaster Management Forum, 1998.

Food Security

Adverse environmental degradation are also affecting country's food security. Since agriculture is the main economic activity of Bangladesh, and rural peoples are highly employed in this sector, impact of natural calamity on national food consumption is in a threat to the well being of the nation. The south western part of Bangladesh now bears the brunt of the ravages of climate change in almost unimaginable proportions. The water in most of the ponds in villages of Satkhira, Bagerhat, Khulna, and Barisal has turned into saline, while tubewells now fail to yield drinkable water. The saline water has affected cultivation of vegetables, crops, and sweet water fish.¹² It has already made drastic fall to our normal national consumption of animal protein such as meet

Table 2: Changes in selected food security indicators 1990- 2000.

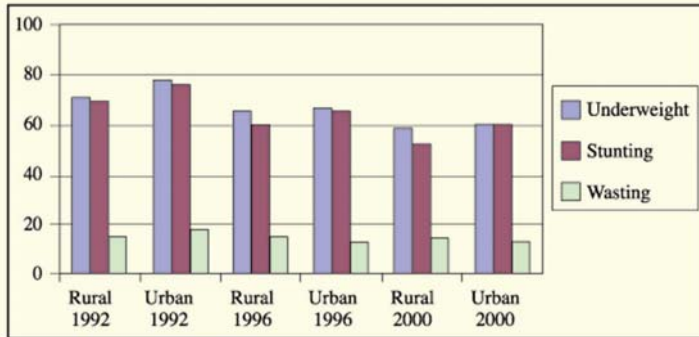
Indicator	1990	2000	Progress 1990-2000 (%/annum)
Income-poverty (% of population)	59	50	-1.5
Extreme poverty (% of population)	28	19	-3.2
Infant mortality rate (%)	94	66	-3.0
Under-5 mortality rate (%)	108	94	-1.3
Maternal mortality rate (%)	480	320	-3.3
Life expectancy (years)	56	61	0.9
Underweight (% of children)	67	51	-2.4

Source: ERD (2002)

and milk. Peoples, living in the area of North Bengal and coastal lands, face starvation routinely and are trying different ways at different times to get rid of extreme hunger. This is very unfortunate that day by day, our national consumption of direct calorie intake is decreasing at an alarming rate.

Fisheries

Our fishery resources are also affected by unplanned industrialization through environmental pollution. Due to the lack of integrated environment mitigation program, industrial waste products and waters with high level of toxic dioxide are consistently polluting country's major water resources and making an imbalanced condition for country's local ecological and hydrological system. This, in the long run, contributing irreparable damages to our fishery resources. Since this is our major source of national nutrients consumption and



Source: Based on ERD (2002)

Figure 3: Rates of child malnutrition among under-fives in rural areas and urban slums (percentages)

meet the protein needs, decrease of fisheries added extreme vulnerability to mitigate nutritional deficit of our nation's future generation.

Bangladesh's wetlands are reported to have reduced to half its size and the fisheries' catch has dropped by an average of 9 per cent every year over the past decade.¹³ If the present trend continues, in 50 to 100 years, there may be no open water fisheries production at all the country.¹⁴ However, the quantity of capture fisheries is declining. The share of the capture fisheries in the total catch has declined from 63 per cent in 1983 to 52 per cent in 1993.¹⁵

Health Security

The challenges of climate change and environmental degradation also increasing health hazards. Although Bangladesh is at its primary phase of industrialization, due to its huge number of population and lack of proper monitoring regulation on carbon dioxide emission, environmental pollution in urban areas are increasing the intensity of health insecurity.

World Bank Document (Project Appraisal Document on Air Quality Management Report no. 20753-BD) says, air pollution in Dhaka is estimated to cause 15,000 premature deaths and 6.5 million cases of sickness every year.¹⁶ The World Bank estimates that the economic cost of this avoidable sickness and death ranges from US\$ 200 million to US \$ 800 million per year or 0.7% to 3.0% of Gross Domestic Product (GDP).¹⁷

Arsenic contamination is another health security threat of Bangladesh to mitigate environmental

challenges. Due to lack of fresh drinking water, millions of peoples in Bangladesh including women and children are suffering with water borne and water related diseases like Diarrhea, Malaria etc. Since our surface water has already been polluted at an alarming rate, people started to use ground water as pollution free. But now the contamination of ground water is also becoming major cause of diseases of our nation.

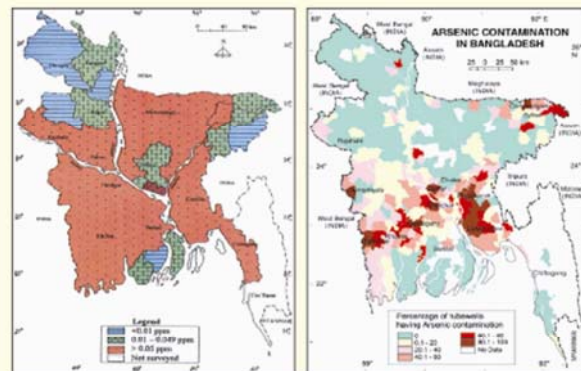
In December 1999, Bangladeshi officials admitted some 80 million people or more than 65 per cent of country's

Table 3: Demand, supply and deficit of water in Dhaka City

Year	Population (Lakhs)	Demand of water (Crore liter)	Supply of water (Crore liter)	Deficit of water (Crore liter)	Running deep tube wells (Number)
1963	8.5	15	13	3	30
1970	16.6	26	18	8	47
1980	30.3	55	30	25	87
1990	55.6	100	51	49	156
2000	102.4	150	113	37	308
2001	107.1	160	122	38	336
2002	112.0	168	130	38	381
2003	117.2	176	150	26	402

Source: Dhaka WASA

population lived in the arsenic-tainted areas. According to different reports, groundwater of 59 out of 64 districts was contaminated with arsenic in 1999.¹⁸ An estimate shows, 268 upazilas out of 465 have been affected with significantly high concentrations of arsenic.¹⁹ Some estimate suggests that arsenic in drinking water will cause 2,00,000-2,70,000 deaths from cancer in Bangladesh alone.²⁰ The National Media Survey 1998 revealed that only 7% of the rural population, 31% of the urban population and 12% of the total population at the



national level are aware about the arsenic contamination. Among those who are aware of arsenic problem, 71% perceive that it is caused by tubewell water and 23% believe it has been caused by supply water, and 12% could not cite any source. National Institute of Preventive and Social Medicine (NIPSOM) under the Ministry of Health examined 400,000 people in 59 districts and found that 60% of the arsenic affected people were male and among the affected people 55% were between the age group of 16 and 40 years. The arsenic affected people under 15 years of age was 14.5%.²¹

Ecological Imbalance and Ethnic Security

There are also some very especial man made ecological imbalances in forest and hill tracts regions, responsible for our human security threats. According to an ESCAP Survey, 500,000 to 600,000 people depend directly on the *Sundarbans* for their livelihood.²² Currently, peoples living in this region, are involved in different types of economic activities. *Sundarban*, in fact, is not only important for economic resources but also reveals the importance for making protection against natural disasters. But unfortunately, *Sundarban* is also now facing the negative impact of global warming and sea level rise.

The 500 types of birds and 40 species of animals including the globally endangered salt water crocodile which live in the *Sundarbans* forest would be badly hit by further destruction of the *Sundarbans*.²³

The worst case of mangrove destruction is the complete disappearance of the 21,000 acre *Chokoria Sundarban*.²⁴

Besides the case of *Sundarban*, man made ecological imbalances and human intervention to nature have very much disturbed ethnic security dimension of the nation. Lack of proper environment friendly adaptation measures at our national level have seriously affected the life style of ethnic people and made their forest life uncertain. This has compelled them to migrate and change their economic activities. There are many well documented cases that the displacement of hill people has multiple affects on forest and environment. For example: It is evident that, the construction of the Kaptai dam

displaced over 100,000 people, most of them Chakmas, and submerged 40% of the best rice land of the CHT.²⁵

In Chittagong, Jaflong, Sylhet, Modhupur Rangpur, Dinagpur and Rajshahi, production of Hydro electricity, industrial plantation and search for natural resources, digging of river beds and hill mining all are heavily threatening the indigenous livelihood and unique culture of different ethnic minority groups like Khasi, Chakmas, Garo, etc. The total scenario is deteriorating so rapidly that the Committee for the Protection of Forests and Land Rights in the Chittagong Hill Tracts feared that if the government plan for the expansion of reserved forest from 1990 is implemented, around 200,000 people will be affected.²⁶

Governmental Efforts

To mitigate climate change and adapt to it, following measures have been taken so far by the Government of Bangladesh (GoB):

- i Bangladesh has signed the United Nations Framework Convention on Climate Change (UNFCCC) on 09.06.1992 and ratified it on 15.04.1994.
- ii Government of Bangladesh along with a number of public and non-government research organizations has completed a number of studies on impact of and vulnerability to climate change and adaptation strategies. Though not a major emitter of GHGs, Bangladesh has also studied possible mitigation measures as a guide towards global effort at mitigation.
- iii Bangladesh has undertaken Climate Change Country study with support from US Government in 1994. The project identified vulnerable sectors which are/ will be under threat due to climate change.
- iv Bangladesh participated in Asia Least Cost Green House Gas Abatement Strategy (ALGAS) in 1995-1998. The study included the formulation of national Green House Gases (GHG) abatement strategies consistent with national development priorities and preparation of portfolio of GHG abatement projects.
- v Bangladesh has submitted its Initial National Communication to UNFCCC in 2002.

The National Adaptation Program of Action (NAPA) has been prepared by the Ministry of Environment and Forest (MOEF), Government of the Peoples Republic of Bangladesh as a response to the decision of the Seventh Session of the Conference of the parties (COP7) of the United Nations Framework Convention on Climate Change (UNFCCC).²⁷

Despite the above mentioned efforts made by the Government of Bangladesh, Bangladesh is yet to promote an integrated disaster Management approach domestically to meet the challenges. Hence, some problem areas regarding disaster preparedness, inter alia, include the following:

- Inadequate policy direction;
- Lack of vulnerability assessment;
- Lack of appropriate counter disaster plans;
- Inadequate or inappropriate organizational structure;
- Over-concentration on response and recovery measures;
- Lack of complete inventory of resources;
- Absence of clear allocation of roles and responsibilities of functionaries;
- Inadequate coordination;
- Friction or lack of cooperation between disaster related organizations;
- Absence of a national or central disaster management focal point including well-equipped Emergency Operation Centre;
- Lack of suitable training for Disaster Management Personnel;
- Inadequate public awareness and information concerning disasters.²⁸

Coping with Insecurity

Although Government of Bangladesh is the principal key role player for ensuring environmental security of the nation by formulating and implementing policies relating to planning, coordination and management, reality shows the picture that victims of natural calamity in our country are hardly ever approached

meaningfully for any integrated development support. As a result, frequency of natural disaster increases the sufferings of poor peoples and they usually try to cope with the situation by themselves.

Table 4 : Strategies followed in Coping Crisis

	Type of Crisis Coping	Strategy followed by majority	Next Best strategy	Least Followed Strategy
1	Financial Coping	Take loans from neighbors	Loan from relatives or others	Loan from NGO's
2	Coping with natural disaster (such as flood)	Stay home on 'manchas' incur debt. Cut down on food intake	Take shelter on top of embankment; wait for govt. relief	Move elsewhere
3	Coping with illness	Try coping with events themselves	Ask help from neighbors/relatives	seek help of physicians
4	Coping with insecurity to life and property	Coping situations themselves	Approach neighbors/relatives	Approach union council chairman/police

Source: Zinatunnessa R.M.M. Khuda & others, Women Headed households displaced by river bank erosion; Problems and strategies of survival, quoted in K. Nizamuddin (ed.) p.58.

Policy Recommendation

Bangladesh frequently facing environmental degradation with natural calamity but domestic initiatives for mitigation and adaptation are not enough. However, to count environmental challenges, Bangladesh urgently needs to make a comprehensive policy strategy for adaptation and mitigation. These must be coordinated with international and domestic efforts. Efforts in international arena should include the following measures:

- Since Bangladesh is not major emitter of Green House Gases but facing serious vulnerability of natural calamity, Bangladesh, therefore, should get involved in working for environment protection with world community under the UN Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol;
- We need strong aligned force of partner countries who are also facing the indifferent problems;
- Our diplomatic efficiency should be focused on understanding the politics of international climate diplomacy and we need to have better negotiation skills for making expertise;
- There should have strong coordination among the Ministries of The Government of Bangladesh for demanding the opportunity cost of environmental degradation already occur red in the country by foreign investors and Multinational Corporations.

Moreover, government should get amended existing environmental policy and implement environmental management techniques practically with the development of annual monitoring system and evaluation for each section (for example fisheries, livestock, agriculture, coastal, marine, river, underground water, meteorology, geology etc).²⁹ These should also include following measures:

- Coordinate each section with data sharing followed by top down / bottom up method.
- Get all municipal corporations involved very much actively in the environmental issues providing particular urbanization planning for the real estate companies.
- Help create public motivation through mass media television, radio, rally, advertisement, meeting, festivals etc.
- Make it obligatory for all NGOs, industries and companies to get themselves involved environmental issues and its protection following the environmental policy.
- Provide financial aid (small scale) to all NGOs and other environmental companies with a proper monitoring system.
- Suggest each national and public university to conduct applied research on environmental issues for future decision making.
- Make a proper plan to keep sustainable environmental ecosystem in the Bay of Bengal.³⁰

Conclusion

Bangladesh's future survival as a sustainable developed country is highly correlated with its efficiency to cope with the security threats of climate change. The time for action is now to address simultaneously the current adaptation deficit and to incorporate mitigation. We should generate our capacity for integrated policy framework with our development agenda on an urgent basis. We should focus our human security dimension on climate change in all aspects of our foreign and economic affairs.

Bangladesh needs to take effective measures to enhance mass awareness about the vulnerability and longterm affects of climate change at different levels including the poor who will be affected most adversely. Since there is a serious lack of recognition and lack of considerable, authentic data base with analytical assessment reports, on this issue it is therefore, very difficult to identify the trends of vulnerability climate change. Since the impact of Climate change is also interrelated to achieve the Millennium Development Goals (MDG) and becoming a concomitant threat to the Poverty Reduction Strategy Paper (PRSP) of Government of Bangladesh, today's poor will be turned into extreme poor if we do not take effective strategy for adaptation and mitigation at local and national level now to cope with climate change and ensure the security of Bangladesh.

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