

## **Climate Change in Bangladesh and its Impact on Housing**

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### **Introduction**

Let me begin my deliberation with the definition of the term so as to recapitulate all of our thinking on the much talked concerning issues of climate change (CC).

CC means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods (Article 1, United Nations Framework Convention on Climate Change). CC refers to any change in climate over time, whether due to natural variability or as a result of human activity (Inter-governmental Panel on Climate Change, Working Group I AR4, 2007).

CC denotes to any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer). Climate change may result from:

- natural factors, such as changes in the sun's intensity or slow changes in the Earth's orbit around the sun;
- natural processes within the climate system (e.g. changes in ocean circulation);
- human activities that change the atmosphere's composition (e.g. through burning fossil fuels) and the land surface (e.g. deforestation, reforestation, urbanization, desertification, etc.)

Here is a statement of one of the Ayla victims of Khulna region which implicitly highlights the impacts of CC on the shelter. It reads as follows, "I had five houses but only one is left, all are destroyed by cyclone Ayla. We were not poor, we had everything but now we are street beggars. It happened within a few seconds. Water flew up to eight feet over the embankment. Now it looks like sea. In tide, saline water flows over the land so we have no way to grow here anything. How shall we get food, shelter and education now? Some people are going to Dhaka and other cities but we cannot dare to do so, ultimately we have no choice. We have to live here with all these sufferings."

Following this introduction, the present paper makes an endeavor to discuss the impacts of CC on shelter sector of Bangladesh vis-à-vis the problems and potentialities of National Housing Authority (the national agency responsible of providing housing) in addressing the housing problems emerged due to CC. Finally, the paper concludes with some key messages in addressing holistically the impacts of CC on housing in Bangladesh.

### **Observed Impacts of Climate Change**

Bangladesh is already witnessing the adverse impacts of global warming and CC. The following impacts have been observed: summers are becoming hotter, irregular monsoon, 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. CC impacts are already adding significant stress to our physical and environmental resources, human ability, and economic activities. Impacts of observed changes are felt most in the following sectors: water resources, coastal resources, agriculture, health, livelihood pattern, food security and habitat/settlement security.

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

- The 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. 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.

However, the exact magnitude of the changes in the global climate is still uncertain and subject of worldwide scientific studies. It is broadly recognized that Bangladesh is very vulnerable to these changes. Indeed, it has internationally been argued that Bangladesh, as a country, may suffer the most severe impacts from CC. Bangladesh is highly vulnerable, because it is low-lying, located on the Bay of Bengal in the delta of the Ganges, Brahmaputra and Meghna and densely populated. Its national economy heavily depends on agriculture and natural resources that are sensitive to CC and sea level rise.

A major concern for Bangladesh is that CC victims who increasing in number every day must seek refuge due to loss of their homes, land, settlement to river erosion, coastal erosion, and permanent inundation. Four major types of victims due to effects of CC on human settlements and habitat need to be highlighted. These are: 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. 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.

According to one analysis “in the severe climate change scenario, sea level rise poses an exponential threat that would inundate 18% of Bangladesh’s total land, directly impacting 11% of the country’s population. Salt water intrusion from sea level rise in low-lying agricultural plains, along with other hazards, could lead to 40% decrease in food grain production and will increase forced migration to the urban slum areas”(Md Shamsuddoha and Rezaul Karim Chowdhury, *Climate Refugee: requires dignified recognition under a new Protocol*, Equity and Justice Working Group Bangladesh 2009). Further, another estimate shows that with just a 1 to 2 degree increase in temperature would force physical dislocation of more than 35 million people in Bangladesh.

However, actual information regarding the extent of sea level rise in Bangladesh is very limited. Over the last 100 years Bangladesh has warmed up by about 0.5°C and 0.5 m rise of sea level in the Bay of Bengal. In the South western Khulna region 5.18 mm/year sea level rise is recorded which may reach to 85 cm by 2050. The World Bank’s study on the impact of sea level rise in Bangladesh reveals that, 100 cm sea level rise within next 100 years will inundate 15% to 17% of country’s land area i.e. 22,135 to 26,562 square kilometers, which will make 20 million people environmental refugee and a country like Bangladesh might not be able to accommodate such huge uprooted people.

### **Housing Situation in Bangladesh**

With 154 million people, Bangladesh is one of the most densely populated countries in the world. Land prices are high, natural disasters are frequent, and well-built permanent housing is rare (approximately 2% in rural areas and 23% in urban centers).

Some estimates suggest that there is a shortage of about 5 million houses in Bangladesh; at present about 500,000 and 3.5 million houses are built annually in urban and rural areas respectively. The overall need for housing upgrading is also high having the problem of the temporary nature of most dwellings and the proliferation of slums in Dhaka city and other larger cities of the country. The housing supply stock, however, is not at par with the growing demand for it except the upper income groups are catered to by the private developers.

Some NGOs and microfinance institutions (MFIs) have come forward to provide fund for self-construction of houses by the lower-income groups, but in terms of scale of the demand the efforts are smaller. The Government's present housing provisions have not been well-managed to address this emerging issue adequately. Further, the housing affordability of the people has been recently worn out by the rising prices of land and building materials. Especially, this phenomenon makes urban housing prohibitive for the lower-income groups. It is to be noted here that the infrastructural need to facilitate housing expansion in the sub-urban and rural areas is not being met up.

### **Emerging Issues and Concerns**

#### **Poor People, the most affected**

Poorer people are more susceptible to the damage caused by cyclones, tidal bores, and flooding for a variety of reasons. The poor typically live in substandard housing that is more vulnerable 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.

#### **Damage of the existing houses**

A number of houses in the coastal areas of Bangladesh are being damaged due to the occurrences of natural disasters and people are becoming either homeless or being compelled to live in dilapidated condition. Consequently, the housing stock in the coastal region would be decreased. As a result, the living condition of these people is becoming unhealthy and the overall quality of life is deteriorating.

#### **Shortage of local building materials**

The locally available building materials such as bamboo, wood, straw, rope, thatch, leaves, etc are becoming day by day scarce, costlier, non-durable, etc since the production of those materials have already been fallen down abruptly. This is mainly due to the intrusion of saline water which is deemed as one of the repercussions of CC.

#### **Shortage of technical man-power for constructing/repairing houses**

Another concern that has risen due to CC is that there is dearth of locally available technical man-power for constructing and repairing houses since these people are migrating to the urban areas in search of their mere survival. As a result, the houses affected by natural disasters remain unrepaired and unfixed. There is also significant rise of wages of the carpenters, masonry, plumbers and other related labourers who are used for constructing and repairing the houses.

#### **Damage of the existing infrastructure needed for housing**

Housing does not only include the structure itself; it encompasses approach roads, drains, water supply, sanitation, community facilities, etc. Among the most significant of all the potential impacts of CC on human settlement relating infrastructures are: the surrounding community, neighbourhood, village or relevant social unit where individuals live, the supporting physical infrastructure (e.g. water and sanitation services and communications links) and social and cultural services (e.g. health services, education, religious, cultural, recreational services, etc). Natural disasters have already caused a lot of damages to these infrastructures needed for housing.

#### **Availability of land for housing**

Due to inundation of land by floods, intrusion of saline water, etc, the availability of buildable land for housing is becoming a problem.

### **Initiatives so far taken in addressing the Arisen Problems**

In fact, a number of initiatives have been taken by the Government in the form of plans, programmes and projects to meet the challenges of CC. Some of the note-worthy initiatives are as follows:

- Coastal Embankment Rehabilitation Project
- Coastal Greenbelt Project
- Integrated Coastal Zone Management Plan
- Khulna - Jessore Drainage Rehabilitation Project
- National Water Management Plan

- Water Sector Improvement Project
- Small-scale Water Resources Development Sector Project
- River Bank Protection Project
- Command-Area Development Project
- National Water Management Plan
- Sustainable Environmental Management Program
- Forth Fisheries Project
- Sundarbans Biodiversity Conservation Project
- Forestry Sector Project
- Third Water Supply and Sanitation Project
- Bangladesh Climate Change Strategy and Action Plan, 2009,
- Strategic Program for Climate resilience/Pilot Program for Climate Resilience

Reviewing all the above mentioned initiatives, it can be said that none of these have either exclusively or holistically dealt with the concerning issues related to the shelter sector emerged due to CC in Bangladesh.

However, the present Government has taken an ambitious programme of establishing of a CC Fund amounting Taka 300 crores which includes the matter of human settlements.

### **National Housing Authority**

Now let us discuss about the problems and prospects of involvement of National Housing Authority (NHA) in the state of affairs of CC so as to address its impact on housing sector.

In the light of national housing policy and need to deal with the housing problem, the then National Assembly has passed the National Housing Authority Act, 2000. In accordance to this Act, the erstwhile Housing and Settlements Directorate (HSD) have been abolished and a new organization named National Housing Authority (NHA) has been established on 15 July 2001 through a gazette notification with wider scope of its responsibilities.

The charters of duties of NHA are as follows:

- Conduct study, collect and preserve information regarding housing of the country
- Development of national housing policies and presentation to the Government for approval
- Undertake low cost housing projects and projects on self-help basis both in urban and rural areas subject to the approval of the Government
- Formulate housing programme for the natural disaster and emergency situation and its implementation
- Undertake housing programmes for the destitute women especially for the helpless poor
- Construction of buildings, houses, apartments and flats on NHA's land and land handed over to it by the Government
- Organize national and international conferences, seminars, symposiums, workshops, etc regarding housing
- Conduct research work on housing
- Allotment of flats, plots, etc and execution of lease deeds, permission for sale, mortgage, mutation and collection of rent revenue and other charges
- Development of urban centres at the Upazila levels
- Attract foreign and local investment to implement housing projects
- Take any other activities necessary in carry out the above mentioned functions.

In essence, NHA has been empowered to perform a wide range of activities in the housing sector both in urban and rural areas of Bangladesh.

Since its inception, NHA has successfully completed a number of plans and projects on different areas of housing development in the country to cater the needs of the low and middle income groups of the people. These projects were housing estates, residential flats, commercial buildings, sites and services, residential plots, rehabilitation plots, industrial plots, institutional plots, primary schools, health centres, and on. All these activities of NHA have tremendous positive impacts not only on the development of housing facilities for the common people but also boosting up the construction industry of the country, at large.

NHA's experience and expertise of dealing with housing problems of the poorer section of people are to be noted. Its staff technical capability in constructing low cost housing units is another added attribute to be assigned for any CC resilient housing programmes.

### **Some Proposed Initiatives**

In the light of experiences learnt and the Government's involvement towards dealing with impacts of CC on housing, the following initiatives have been proposed to be undertaken by NHA and other related organizations:

- Inclusion of issues and problems of shelter emerging due to CC in the National Housing Policy which was formulated in 2008
- Mainstreaming the housing issues with all CC related plans and programmes
- Strengthening capabilities of NHA in terms of its staff training, sharing knowledge and experiences with expertise of other countries, adequate budgetary allocations, establishing a CC cell, etc. to meet the upcoming challenges of CC in respect of housing
- Undertake a baseline study to know overall housing situation of the country arisen due to CC
- Consultation with related stakeholders – private sector, civil society, GOs and NGOs
- Research and knowledge management to predict the likely scale and timing of CC impacts on shelter sector to underpin future investment strategies; and to ensure that Bangladesh is networked with the latest global thinking on CC

### **Concluding Observations**

Specifically, it is to be noted here that the Article 15 of the Constitution of the People's Republic of Bangladesh states that the state will provide to its citizens the basic necessities of life including food, clothing, shelter, education and medical care. Further, the 1948 Universal Declaration of Human Rights of the UN Convention ensures the right to adequate housing. The right to adequate housing has been defined as 'the right to live somewhere in security, peace and dignity; core elements of the rights include security of tenure, protection against forced evictions, availability of services, materials, facilities and infrastructure, affordability, habitability, accessibility, location and cultural adequacy'. In order to uphold these premises, there is need for urgent action in this direction encompassing the issue of CC and its impacts on housing. It is to be remembered that this task is not so easy to do which needs plethora of actions including (most importantly) political commitment.

Policy makers, academicians, researchers, activists, scientists from all related corners urgently need to focus attention on the implications of CC on housing sector. Initiatives and efforts for adaptation to CC's impacts on housing sector must start now as shelter is one of the fundamental constitutional rights of human beings. The CC and variability are already having profound effects on the poorer communities. The vulnerability of the poorest to CC is a central challenge. This challenge is to be addressed holistically. Our realistic thinking and actions must be taken in advance before the situation goes beyond control.