Analysis of Socio-Economic Conditionof Environmental Refugees in Dhaka

A thesis submitted in partial fulfillment of the requirements

for the degree of

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SUBMITTED BY

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Abstract

Bangladesh and natural disaster are closely related to each other because of the geographical location of it. Natural disaster, affected people by these disasters and migration of these people to urban areas or mega city is not unknown to the country. Environmental degradation and natural disasters play a contributing role in affecting population movement. People are forced to move from rural to urban areas. Some experts declare that number of incidents, that cause people to leave their houses and fields due to natural disasters, is increasing rapidly and they perceive this as a global serious issue. The work explores the subject of environmental refugees as a significant group of migrants, includes definition of the term, explanation of main reasons for fleeing the people from their habitats and the socio economic condition of the environmental refugees before and after the migration. There is a huge difference between their present and previous socio-economic conditions. Along with their migration, so many things happen such as difficulties in the local economy and population pressure on the city. This research is an attempt to find out the comparison between the previous and present socio economic conditions of the environmental refuges and to suggest some guidelines to control the migration and to improve their conditions.

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I would like to thank Almighty Allah for giving me the strength to do such a work in my life. I am deeply indebted to my parents and some of my relatives and friends for their help and inspiration. Finally, I would like to convey my obligation to the many people, who were forced to suffer from my continued need for assistance, discussion and encouragement at different stages of field work for this research.

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CHAPTER – I

1.1 Background of the Study

Mahe Noor left her village in southern Bangladesh after “Cyclone Sidr” flattened her family’s home and small shop in 2007. Jobless and homeless, she and her husband, Nizam Hawladar, moved to this crowded megalopolis (Dhaka), hoping that they might soon return to the origin. Nizam Hawladar walked through the slum area outside of his home in Dhaka, Bangladesh, on the way to work at his tea stand. Mahe Noor and Nizam Hawladar with two of their children live in Dhaka, Bangladesh. A cyclone two years ago uprooted them from a village where they had their livelihood. (The New York Times, Jan 3, 2010)

This is very common scenario of environmental refugees in Bangladesh. As climate change becoming an important talk of the topic day by day, the numbers of environmental refugees are also increasing. Natural calamities have plagued humanity for generations. But with the prospect of worsening climate conditions over the next few decades, experts on migration say tens of millions more people in the developing world could be on the move because of disasters.

There is a new phenomenon in the global are an: environmental refugees. These are people who can no longer gain a secure livelihood in their homelands because of drought, soil erosion, desertification, deforestation and other environmental problems, together with associated problems of population pressures and profound poverty. In their desperation, these people feel they have no alternative but to seek sanctuary else where, however hazardous the attempt. Not all of them have fled their countries, many being internally displaced. But all have abandoned their home lands on a semi-permanent if not permanent basis, with little hope of a foreseeable return. (Myers, 2001)

The United Nations Environment Program entitled Environmental Refugees, El-Hinnawi defined environmental refugees as "people who have been forced to leave their traditional habitat, temporarily or permanently, because of a marked environmental disruption (natural and/or triggered by people) that jeopardized their existence and/or seriously affected the quality of their life. (*http://en.wikipedia.org/wiki/Environmental_migrant,* retrieved on 5th November, 2010).

In 1995 these environmental refugees totaled at least 25 million people, compared with 27 million traditional refugees (people fleeing political oppression, religious persecution and ethnic troubles). The environmental refugees total could well double by 2010 (though there is no good estimate of today's total). Moreover, it could increase steadily for a good while there after as growing numbers of impoverished people press ever harder on over-loaded environments. When global warming takes hold, there could be as many as 200 million people over taken by disruptions of monsoon systems and other rainfall regimes, by drought so fun precedented severity and duration, and by sea-level rise and coastal flooding. (Myers,2001)

Natural calamities have plagued humanity for generations. But with the prospect of worsening climate conditions over the next few decades, experts on migration say tens of millions more people in the developing world could be on the move because of disasters. Rather than seeking a new life elsewhere in a mass international “climate migration,” as some analysts had once predicted, many of these migrants are now expected to move to nearby megacities in their own countries.

“Environmental refugees have lost everything,” said Rabab Fatima, the South Asia representative of the International Organization for Migration. “They don’t have the money to make a big move. They move to the next village, the next town and eventually to a city.”

Such rapid and unplanned urbanization is expected to put even further strains on scarce water, energy and food resources, said Koko Warner, who works in environmental migration at the United Nations University Institute for Environment and Human Security in Bonn.

In Bangladesh, a largely flat, riverine nation where more than 140 million people live in one of the most densely populated countries in the world, past generations often moved to cities seasonally. They worked to send money home to their villages and usually returned there during planting season.

But in recent years, the moves are more likely to be permanent. More intense storms and floods, salinization damage to crops caused by the encroaching sea and especially worsening river erosion have left many people rootless, Ms. Fatima said.

Dhaka, the capital, is often the only real option in this region. It is the fastest-growing megacity in the world, according to the World Bank. At least 12 million people live in Dhaka, and there are more than 400,000 newcomers each year. The World Bank predicts that thepopulation could grow dramatically by 2020.Like the rest of Bangladesh, Dhaka is also extremely vulnerable to climate change: It is just a few meters above sea level and is regularly hit by cyclones and floods. The environmental group WWF recently rated it among the megacities most vulnerable to the effects of global warming, after Jakarta and Manila.

As many as half of the people in Dhaka live in shantytowns and slums, says Atiq Rahman, a climate change researcher and executive director of the Bangladesh Center for Advanced Studies. Of those, Mr. Rahman and Ms. Fatima estimate that three million people have been displaced by environmental degradation or disasters.

Due to global warming and climate change recently Bangladesh facing various disasters in a frequent way. As the frequency of disasters are increasing the number of environmental refugees or migrants are also increasing. Major part of these people are diverting to the mega city Dhaka. Huge changes come into their socio economic conditions. Patterns of life changes drastically.

1.2 Description of the Study Area

As a whole the study is based on Dhaka city. Dhaka is located in central Bangladesh at 23°42′0″N90°22′30″E/ 23.7°N 90.375°E, on the eastern banks of the Buriganga River. But for more specification study areas are chosen three distinct word of Dhaka city. They are Ward no. 19, 43 and 81. These wards have been chosen because there are so many slums and the environmental refugees are mainly taken shelter in the slums where low cost housing are exists.

Ward no. 19

According to CUS-

- Number of slums: 37
- total slum area: 167.194 acre
- Total slum population: 124097
- Total no. of household: 22757

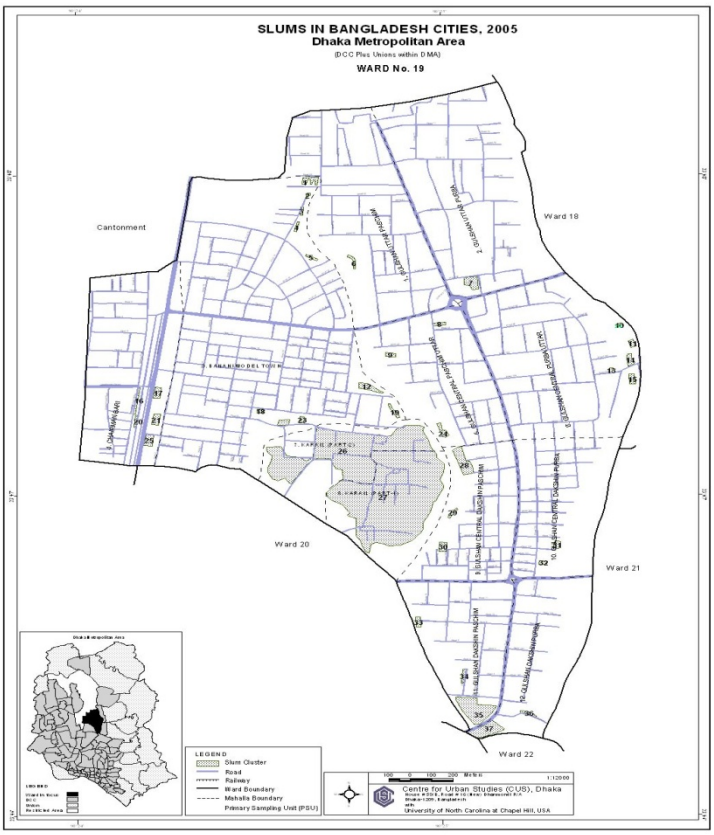

Figure 1.1: Ward no. 19
Source: CUS

Ward No. 43

According to CUS-

- Number of slums: 35
- total slum area: 57.77 acre
- Total slum population: 33297
- Total no. of household: 6627

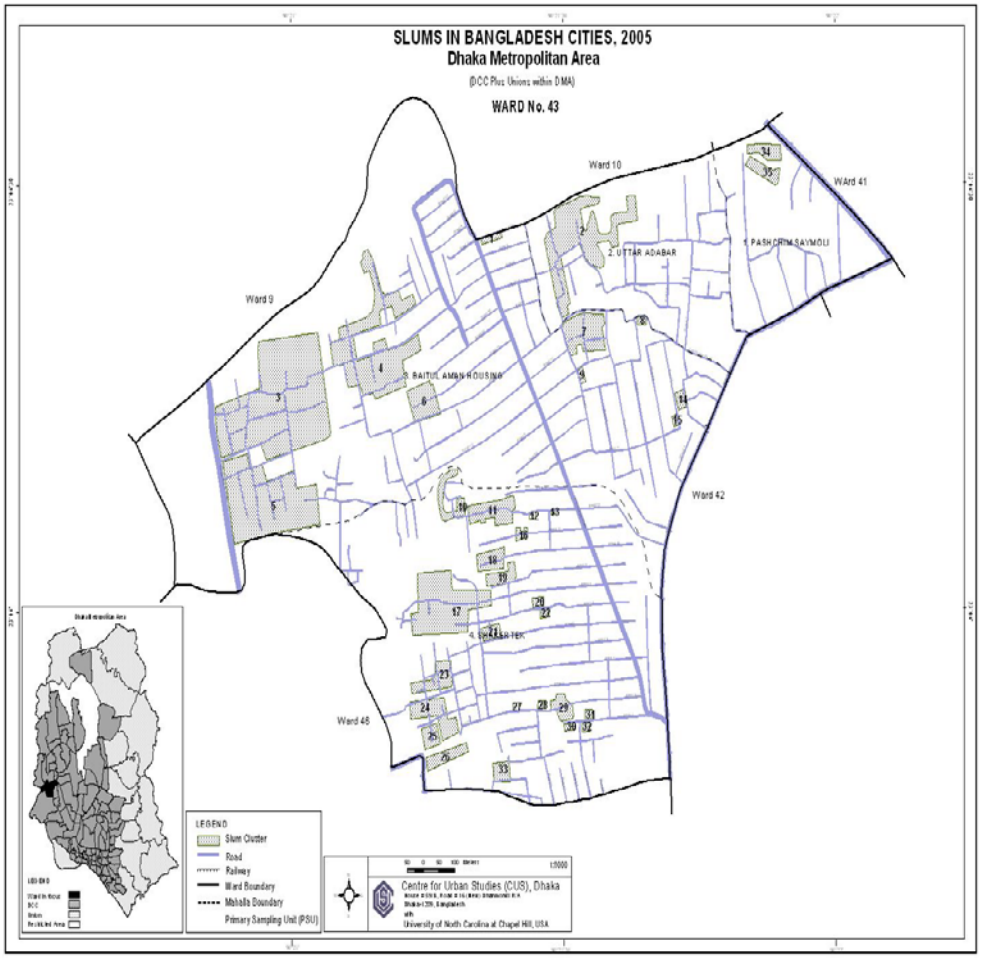

Figure 1.2: Ward no. 43
Source: CUS

Ward No. 81

According to CUS-

- Number of slums: 35
- total slum area: 22.65 acre
- Total slum population: 26073
- Total no. of household: 5056

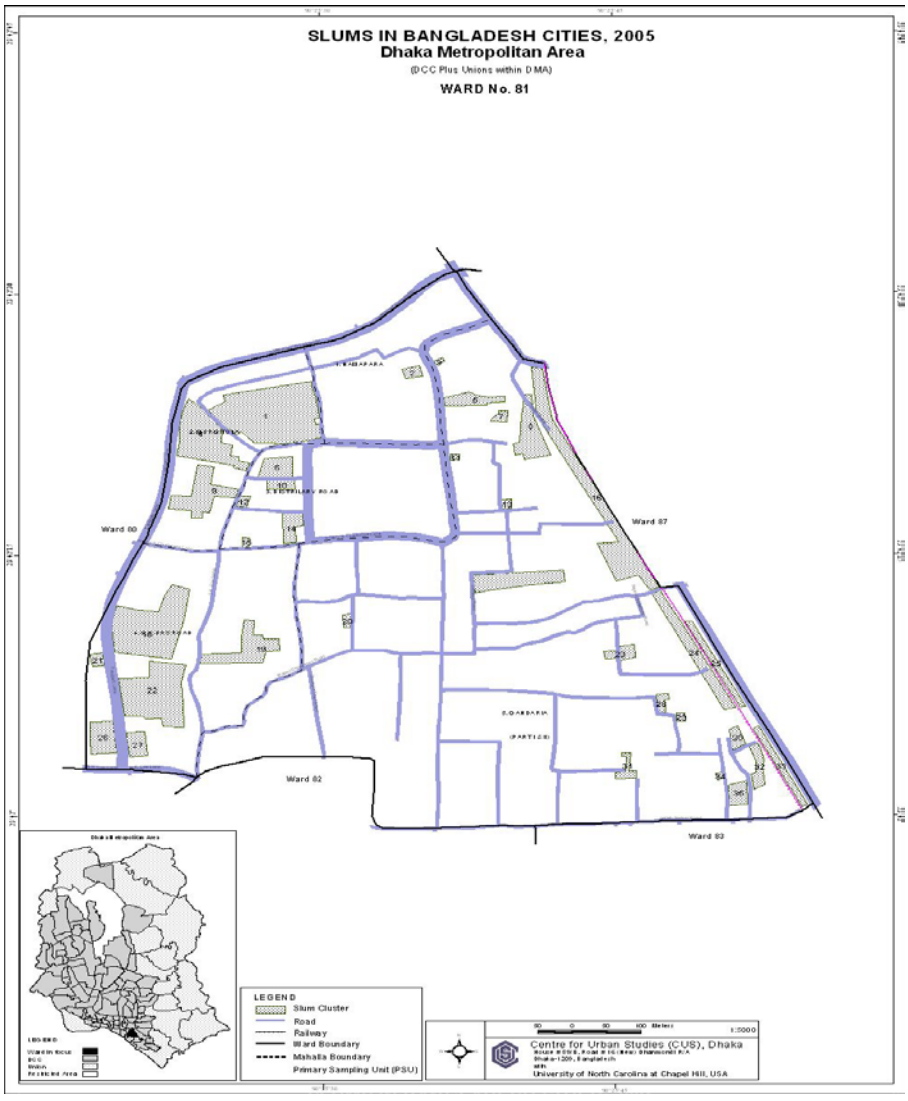

Figure 1.3: Ward 81
Source: CUS

1.3 Objectives of the Study

The purpose of the research is to study the existing and previous condition of environmental refugees in the capital city Dhaka. The main objectives of this research are as follows:

- To identify the leading environmental factors behind the migration.
- To analyze the present and previous socio economic condition of environmental refugees.
- To recommend some guidelines on the basis of the findings to control the migration and to improve their condition.

1.4 Rationale of the Study

Human induced changes in the global climate and associated sea level rise are widely accepted with policy makers and scientists. The Intergovernmental Panel on Climate Change (IPCC) concluded that the balance of evidence suggests a discernible human influence on global climate. 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 climate change. 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 strongly depends on agriculture and natural resources that are sensitive to climate change and sea level rise. (*http://www.mungo.nl/CC_Bangla.htm*, retrieved on 6th November, 2010)

The highest percentage of pressure of shifting of environmental refugees is falling on the Dhaka city. According to the historical data, from a small city of only 336 thousand populations in 1951, it is now a mega city of over 10 million people- more than thirty times increases in just fifty (50) years time (Islam, 2001). The average annual growth rate of Dhaka city's population during the last three decades has been over 7%, thus doubling the population in every decade (Islam, 2001).

On average, over the last thirty years, the city population grew at about 7% per decade (DMDP, 1995). At the same time the, serviced area expanded at 4% approximately (DMDP, 1995).

At this growing situation environmental refugees are becoming the burden of this city. But this is not their fault. They are the unfortunate people. They are the part of our society but they are not treated well. Proper planning of them is needed to give them facilities of housing, job and more over the basic needs. But before providing these study is needed to know about their socio-economic condition is needed.

This research will concentrate on the following questions:

- What are the leading environmental factors behind the migration?
- What is the existing condition of environmental refugees in Dhaka?
- What are the comparisons between the socio-economic conditions before and after migration?
- What would be the possible guidelines to restrict the environmental migration and to improve the socio economic condition of them?

1.5 Scope of the Study

A research starts from a step where someone might have stopped the search for new information. This research will also guide many researchers to research more on the related issues. There is vast scope to research on the climate change issues that is affecting our country and related issue of the urban poor living in the urban areas. This research work will deal with the environmental refugees to analyze the comparison between there previous and present socio-economic condition. It will tend to focus the sufferings of them and also indicate the need for planning of environmental refugees to provide them the basic needs.

1.6 Limitations of the Research

There were many limitations while conducting the study, and these ares-

- Research works on environmental refugeesare very few and the people involved with this type of research are not very interested to give their data.

- No fixed data about how many of the people are being affected by the climate change or the global warming in the country.
- The time was very short to the research work.

1.7 Organization of Dissertation

This thesis paper contains following chapters-

Chapter 1:"Introduction", it contains the background of this research work, its aims and objectives, justification, description of the study areas,scope and possible outcomes of the study.

Chapter 2: "Methodology" contains the procedure of completing the entire research work. It refers the study including formulation of research questions, selection of the topic, literature review and conceptualization, formulation of the study, selection of the study area, data collection, analysis and interpretation, draft and final submission.

Chapter 3: "Definitions and Concepts" contains conceptual issues in climate Change and natural hazards, Bangladesh and natural hazards and environmental migration, socioeconomic condition of environmental refugees.

Chapter 4: "An Analysis of Socio-Economic Condition of the Environmental Refugees of Dhaka City" shows different analysis on the socio-economic condition of the environmental refugees coming to the city including their income source, social aspect and other many cause related to them.

Chapter 5: "Findings of the Research and some Recommendations" which includes comparison between previous and present socio-economic condition, impacts, case studies, SWOT analysis and some solutions recommended for the problems have raised.

Chapter 6: "Summary and Conclusion" is included to give the research a finishing touch and a summary to understand the work very easily.

CHAPTER - II

2.1 Introduction

Methodology means the all technique and methods which are used and applied for the fulfillment of the research goals and objectives. The methodology is very important to complete the work. It helps to achieve specific sets of objects by using various methods, tools and techniques. This particular study has been conducted with a predesigned methodology following these stages-

2.2 Conceptualization

It is the most important and essential part of any research. Having a clear conception and understanding leads a researcher to start the study correctly and to go ahead to the finishing smoothly. As this study will mainly focus on the environmental refugees and their existing conditions, related studies on this matter will help to enrich the conceptions. Development of the conception journals, books, research papers and thesis papers have followed.

2.3 Literature Review

Literature review or following the similar studies and researches is an important and unavoidable part of any research. From the literature survey conducted on the present theme of research, it is found that there are few works have been done in the field of environmental migration especially towards Dhaka, but there are some important and handful related publications are found and this topic has widely discussed in many seminars and conferences all over the country and world too. An attempt was taken to formulate the issues and elements with the help of those publications.

Such as, clear conceptions on environmental refugees have been achieved by reviewing the book EnvironmentalRefugees:Our LatestUnderstanding by Norman Myer. Conceptions on the trend of environmental migrants in Bangladesh have been gained by reviewing the research paper “Environmental pressures and rural-urbanmigration: The case ofBangladesh” by MichaelandDavid.Rate of growth of urban population have been achieved from Dhaka

Metropolitan Development Plan (DMDP) 1995. Web browsing also helped to get an overall conception on environmental refugees and the existing condition of them in Dhaka.

2.4 Formulation of Research Questions and Objectives

Having a clear concept on various related issues comes the phase to formulate research questions and objectives. It is very important to formulate the research question before starting any research and to develop specific objectives for the research. The objectives for this research were developed so that the research work would become specific and easy to prepare the final paper. Three objectives were developed related to the research problem.

2.5 Formulation of Hypothesis

The term hypothesis has several meanings. It may be taken to mean a possibility, a supposition or an assumption. In general it is taken as a proposal to accept something as true. It may prove to be correct or incorrect. Formulation of hypothesis is important part of social science research. Research based hypothesis was formulated based on the future situation of the people condition what would be their destination and what the research will end up to.

2.6 Collection of Data Information

The research work is basically based on the primary data, so a huge amount of primary data was collected in forms of questionnaire survey, observation, case studies and key informant interview. And on the other hand secondary data was one of the important parts of the research to make the research more strong in term acceptance and the real impact of climate change on such a country like Bangladesh which is naturally vulnerable. Secondary data will be collected from the Dhaka City Corporation (DCC), BBS report, Center for Urban Studies (CUS) and from many other literature sources.

This study also requires maps and satellite images of climate change, disasters and the affected areas of Bangladesh.

2.6.1 Primary Data

Primary data are original observation collected by the researcher for the first time and analyzed for the research purpose. As this research was based on primary data so following methods were used for the research purpose.

- Questionnaire survey: 300 questionnaire surveys were conducted based on purposive sampling to collect the field level data.
- Observation: Observation involvedthree processes such as (1) sensation, (2) attention and (3) perception. Sensation was gained through the sense organs which depend upon the physical alertness. Then comes the attention which is largely a matter of habit. The third is perception which involved the interpretation of sensory reports.

2.6.2 Secondary Data

Secondary data are those which are collected by others and used by others. Secondary data are mostly published in newspapers, periodicals and journals. So, the following types of data were collected for the research work-

- Documents and Reports: The recent documents and reports related to climate change and migration were reviewed for the research purpose.
- Books: Many books related to migration, poverty and natural disaster were reviewed to give the research a strong support for the acceptance.
- Bangladesh Bureau of Statistics (BBS): It is the organization in Bangladesh to publish census and statistical data and many related data were collected.
- NGO Bureau Office: NGO plays a vital role in poverty reduction sector of the country so they prepare many data on the poverty and even the disasters of the country, which were collected and used in the research.

2.7 Data Analysis and Interpretation of Data Information

After the collection of all information from all possible sources, the collected data has been analyzed and investigated to understanding the reverse condition of the city. The general and advanced statistical and analytical tools were used to analyze the collected data with Arc GIS 9.2, Microsoft Excel 2007 and SPSS software etc. Then findings were portrayed and arranged through various tables, charts, graphs and maps. The data analysis also included as *Descriptive Statistics*-Frequency, Mean, Median; *Analytical Statistics*-Correlations, Regression, Cross table, etc.

The related findings were established based on the data analyzed and different issues of the poverty, natural disaster and climate change and its impact on Bangladesh.

2.8 Thesis Preparation

At the end of the study or the final stage is to prepare the repot. After analyzing all collected data an overall scenario has been focused and the comparison has been mentioned. At last with finalization of maps, charts, tables and photographs, the thesis was prepared which contains the overall research study in detail.

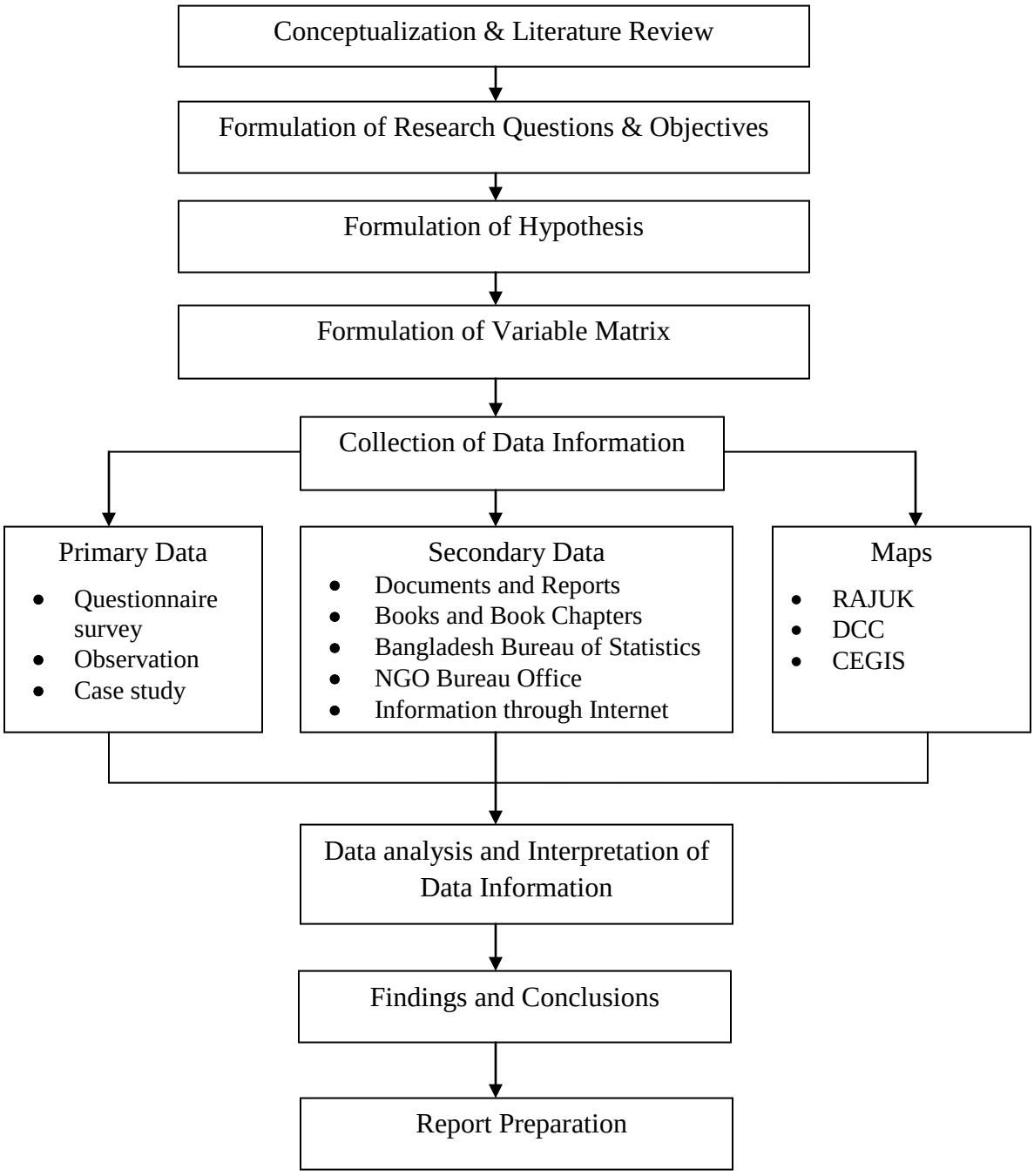

Figure2.1: Research Methodology at a Glance

CHAPTER - III

3.1 Introduction

Comparative analysis on the socio-economic conditions of the environmental refugees as well as environmental migrants is of key importance in social science, environmental science particularly in population studies. The importance comes into view not only from the movement of the people from various places to Dhaka but also from its influence on the migrated peoples lives and on the urban, in a gross sense on the urban planning and plans.

The term “Environmental refugees and their present and previous socio-economic conditions” is not a simple term. It is related with numerous terms that are needed to analyze to evaluate environmental refugees. The concerning terms that are needed to explain and discuss are climate change, disaster scenarios of Bangladesh with its pattern and frequent changes. After that comes to elaborate the environmental refugees. To have knowledge on socioeconomic condition socio economic indicators are necessary to conceptualize.
In a simple form it can be said that climate change occurring natural disasters and natural disasters are enhancing the rate of environmental refugees.

Now a day’s climate change, disaster, environmental refugee and environmental migration from rural to urban are serious issues and the related researches are published rapidly either in newspaper, journals or in the internet. The following are some of the definitions and concepts relevant to the research.

3.2 Definitions and Concepts

3.2.1 Climate Change

United Nations Framework Convention on Climate Change defines climate change as "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." ("*The United Nations Framework Convention on Climate Change". 21 March 1994.*)

Climate change can be defined as a long-term change in the statistical distribution of weather patterns over periods of time that range from decades to millions of years. It may be a change in the average weather conditions or a change in the distribution of weather events with respect to an average, for example, greater or fewer extreme weather events. Climate change may be limited to a specific region, or may occur across the whole Earth. (*http://en.wikipedia.org/wiki/Climate_change*, retrieved on 25th December, 2010).

The familiar term "global warming" is frequently used to represent the effects human activity is having on the Earths climatic processes; however, an increase in average temperatures is only one of many aspects of climate change anticipated in the coming decades. Other expected developments include rising sea levels, changes in precipitation patterns and droughts, and increased frequency and intensity of storms and extreme weather events. (*R McLema, B Smit, 2004*)

IPCC (Intergovernmental Panel on Climate Change) has mentioned, “In Asia, glacier melt in the Himalayas is projected to increase flooding and rock avalanches, and to affect water resources within two to three decades. Climate change will also decrease freshwater availability in large river basins. This, along with population growth and increasing demand from higher standards of living, could adversely affect more than a billion people by 2050. Coastal areas, especially heavily-populated mega-delta regions, will be at the greatest risks due to increased flooding from the sea and the rivers. It is projected that crop yields could increase up to 20% in East and Southeast Asia while they could decrease up to 30% in Central and South Asia by the mid-21st century. Endemic morbidity and mortality due to diarrhea are projected to rise. Increases in coastal water temperature would exacerbate the abundance and/or toxicity of cholera in South Asia. Up to 60% of the income of rural households in Asia is directly related to agriculture production, while the rest comes from waged-jobs in the same sector. Thus, rises in the frequency of floods or decreases in freshwater availability are likely to affect the two main sources of income of these

households. The development of the Asian region will be subject to an increased water stress; it is predicted that up to one billion people will be affected by 2050.

Uddin, Ahmed, Haque, Islam, Reazuddin, Rector, Ali, Haque and Ernst in their report on 'Climate Resilient Development: Country Framework to Mainstream Climate Risk Management and Adaptation' has said, "Climate change will affect people's lives, the environment and the prospects for growth and development in different parts of the world. All three dimensions are fundamental to understanding how climate change will affect our future. A number of authors have suggested that the impacts of climate change on some vulnerable regions can be expected to cause conditions of scarcity, displace large numbers of people, and even lead to mass movements of "environmental refugees". (*http://www.csis-scrs.gc.ca/pblctns/cmmntr/cm86-eng.asp,* retrieved on 25th December, 2010)

'Climate Variability and Change in Bangladesh Impacts, Vulnerability and Risks' Published by Climate Change Cell has mentioned, "Bangladesh is extremely vulnerable to climate change impacts because of its geographical location, high population density, high levels of poverty, and the reliance of many livelihoods on climate-sensitive sectors, particularly rural agriculture and fisheries. These impacts will be falling more heavily on the women and girls of Bangladesh."

Bangladesh is among the countries most affected by the prospects of climate change and by environmental pressures. Climate change also causing various hazards and disasters in our country. Trend and frequency of hazards and disasters are also changing. Hari Srinivas in his paper 'Cities and Urban Vulnerability' has mentioned "Urban areas provide a number of socio-economic opportunities for jobs and income generation, but are also simultaneously becoming increasingly risky places to live, especially for low-income residents of cities in developing countries. Exposure to environmental risk and hazard is a result of physical processes creating these hazards (for example building construction, urban planning, infrastructure provision or transportation), and human processes that lead to vulnerabilities (for example, lifestyle choices and consumption patterns). These issues have cumulatively

creating different impacts in different areas of a city or cities, depending on its socio-spatial structure. Urban areas are not disaster prone by nature; rather the socio-economic structural processes that accelerate rapid urbanization, population movement and population concentrations substantially increase disaster vulnerability, particularly of low-income urban dwellers. Migrants, for example, settle in areas either originally unsafe (susceptible to floods, landslides, etc), or create the potential of man-made disaster (environmental degradation, slum fires, health hazards). Urban vulnerabilities are not limited to just low-income residents – a flood or a typhoon does not distinguish between residents, affecting everyone in its path. Even 'natural' disasters always have social, cultural, institutional and technical aspects involved, which ultimately determine if a natural hazard becomes a disaster."

Although some parts of the world would benefit from modest rises in temperature, at higher temperature increases, most countries will suffer heavily and global growth will be affected adversely. For some of the poorest countries there is a real risk of being pushed into a downwards spiral of increasing vulnerability and poverty.

Average global temperature increases of only 1-2°C (above pre-industrial levels) could commit 15-40 percent of species to extinction. As temperatures rise above 2-3°C, as will very probably happen in the latter part of this century, so the risk of abrupt and large-scale damage increases, and the costs associated with climate change – across the three dimensions of mortality, ecosystems and income – are likely to rise more steeply. In mathematical terms, the global damage function is convex.

No region would be left untouched by changes of this magnitude, though developing countries would be affected especially adversely. This applies particularly to the poorest people within the large populations of both sub-Saharan Africa, and South Asia. By 2100, in South Asia and Sub Saharan Africa, up to 145 - 220 million additional people could fall below the $2-a-day poverty line, and every year an additional 165,000 - 250,000 children could die compared with a world without climate change."

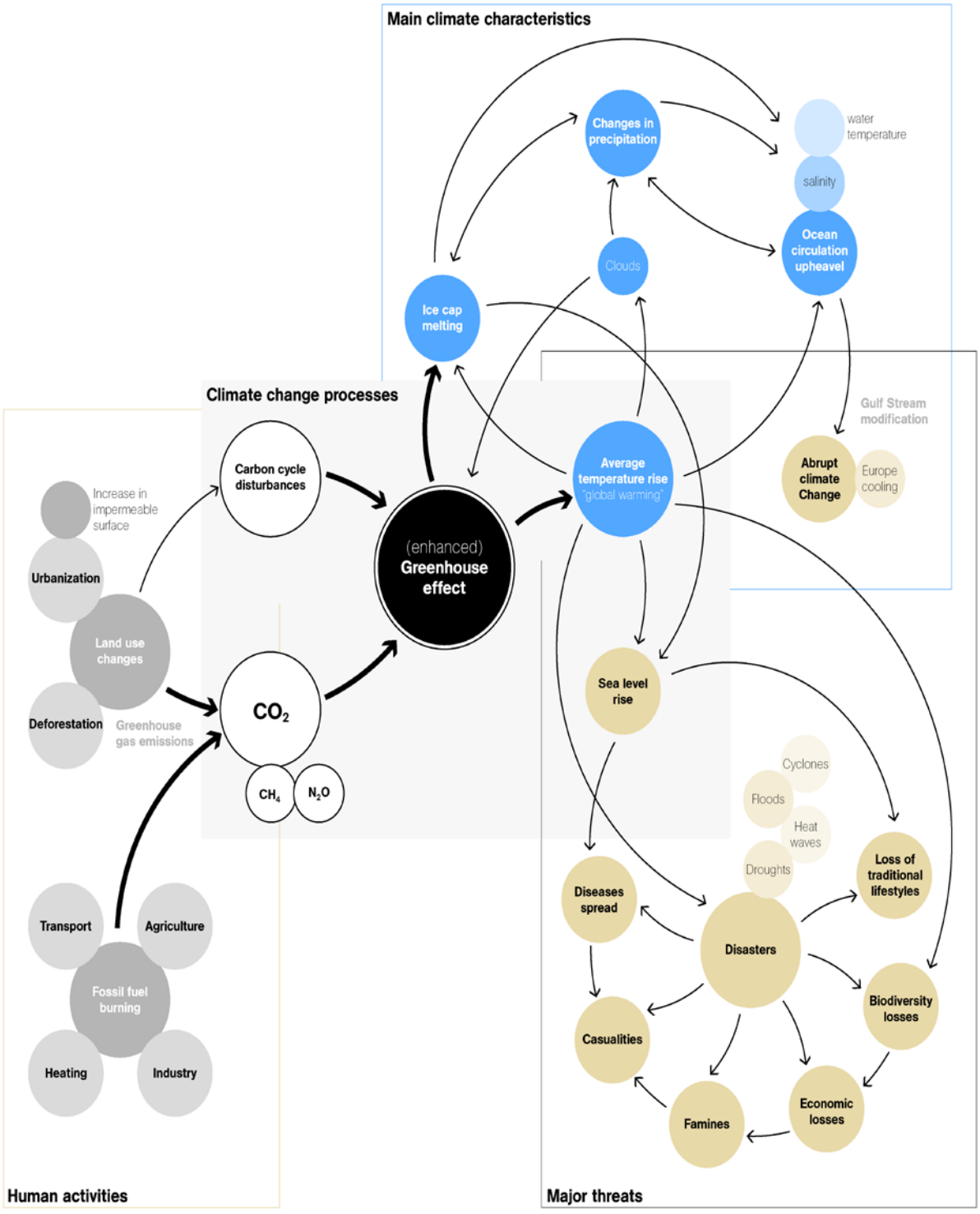

Figure 3.1: Climate Change: processes, characteristics and threats
Source: UNFCCC, 2007

3.2.2 Climate Change, Natural Disasters and Rural-Urban Migration

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, and 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. (Climate Change and Bangladesh, Dept. of Environment, 2007)

Herrmann and Svarin in their paper*Environmental Pressures and Rural-Urban Migration: The Case of Bangladesh* have mentioned that "Although agricultural labor productivity has increased in Bangladesh, it is not so much due to an increase of agricultural value added, as it is due to a decrease of the agricultural labor force, associated with accelerating rural-urban migration in the country. The development of the agricultural sector in Bangladesh is therefore more appropriately measured by yields in agricultural produce. Our data shows that despite considerable investment in agriculture, yields in important agricultural produce have fallen during the past decades. Since the early 1980s yields of groundnuts, rice and wheat fell by 1 mt/ha on average. The main reasons for the weak agricultural development are exogenous factors, notably climate-change induced natural hazards. Natural hazards destroy harvests and threaten food security, especially of poor households (*Herrmann & Svarin, 2009*)."

In China with its 120 million internal migrants, at least six million deserve to be regarded as environmental refugees, having been obliged to abandon their farmlands due to shortages of agricultural plots in the wake of decades of population growth. In Mexico there are one

million new environmental refugees each year. Some become as similated in cities, and a few return home, leaving a cumulative total, as a bare minimum in 1995, of two million. Finally there are those people displaced in voluntarily by public works projects, not ably large dams, and increasing by ten million every year (with a cumulative total of 50 million in just China and India). Most of them resettle else where, but the number remaining in a refugee-like situation totals one million. (*Myers,2001*)

Of the 25 million environmental refugees in 1995, there were roughly five million in the African Sahel, where a full ten million people had fled from recent droughts, only half returning home. Another four million, out of eleven million refugees of all types, were in the Horn of Africa including Sudan. In other parts of Sub-Saharan Africa, where 80 million people were considered to be semi-starving due primarily to environmental factors, seven million people had been obliged to migrate in order to obtain relief food. In early 2000 Sudan featured eight million people who were officially considered at risk of starvation, with another six million in Somalia and three million in Kenya, plus several million others in other countries a sizeable though undocumented proportion of these could be characterized as environmental refugees. (*Myers,2001*)

El Hinnawi (1985) introduced the term "environmental refugees" to denote people forced to leave their homes temporarily or permanently due to environmental problems that risk their life or quality of life. Several studies employed this term. Others argued that the usual definition of refugees–people who flee across borders due to persecution and war–implies that environmental refugees flee across borders due to environmental factors. Since environmental factors also may promote intrastate movements, and migration may be affected by non-environmental factors, authors suggested denoting people *forced* to leave due to environmental problems as "environmental refugees."

Goldscheider edited the book on "Migration, Population Structure & Redistribution Policies (1992) has mentioned that, "The "push"/"pull" dichotomy, though an over simplification, may be a useful starting point in an attempt to sort out the various effects. It may be helpful

to treat migrants as a heterogeneous group, and to consider them along a continuum. At one end, there is the poorly educated group being pushed off the land as a result of population pressures and the decomposition (or modernization) of the social system; at the other, there are those better-educated migrants who, perceiving their opportunities in their country to be limited, are pulled to the country in search of a “better life”.

According to Odingo R., climate change will increase poverty and worsen food security (cite din Davisetal. 2009). Urban poverty will increase if environmentally displaced people keep moving to city, while slum is their potential target for habitation. Such people create pressure on limited natural resources like land, water. Also, the poor are of ten compelled to live in environmentally hazardous are alike low lying flood prone are a occupying wamps, natural lakes.

Poverty reduction and access to food, government’s important development agenda at all time, are under threat due to climate change. Environmental displace menthes already become in tense in geographically and environmentally vulnerable are as in Bangladesh. Thus, climate induced migration to big cities or nearby places is getting spontaneous over the last few decades. For instance, frequent exposure to natural disasters makes coastal people of ten bound to migrate in search of secure live sand livelihoods. There fore, increased slum settlements in western and eastern periphery of Dhaka city indicate physical manifestation of growing urban poverty. Slums are supposed to be potential target for the habitation of displaced people. (Akter, 2010).

3.2.3 Natural Disasters and Bangladesh

Bangladesh with a high population density is spread over a relatively small area. It is prone to disasters such as flood, cyclone, tidal wave, inundation, salinity, earthquake, river erosion, drought, etc. According to NAPA (2005), it is well recognized that Bangladesh would be one of the most adversely affected countries to climate change. Low economic strength, inadequate infrastructure, low level of social development, lack of institutional capacity, and a higher dependency on the natural resource base make the country vulnerable to climate stimuli (including both variability as well as extreme events). (Das, 2010)

Due to its geography and its physical condition, Bangladesh is one of the world's countries most vulnerable to natural disasters. It is located in the delta of three of the world's largest rivers--the Ganges, the Brahmaputra and the Meghna--which all have the ir origin outside Bangladesh. This means that during the monsoon sea son in summer, Bangladesh has to manage not only its own monsoon run offs, but those of its neighbor countries entering the land through the three main rivers. Further more, these rivers have many tributaries forming a dense network covering big parts of Bangladesh's flood plain area whose main characteristic is to be extremely flat. Over 60 percent of Bangladesh's land is six meters be low sea level, facilitating the flooding of large areas (Mirza 2002:127).

Bangladesh is particularly vulnerable to the impacts of climate change and is one of the rare countries in which natural hazards are the main cause of migration (Piguet 2008:6). Bangladesh's vulnerability is mainly due to the mix of high population density and low-lying land. Some estimates predict that by 2050 Bangladesh will have about 15 million environmental refugees (Myers 1993: 754). Further more, Bangladesh’s demo graphic prospects increase the magnitude of the problem.

The World Urbanization Prospects of the United Nations Population Division estimates that by 2050 Bangladesh's population will be of about 254 million people, 1.6 times more than today. Some estimated 57 percent will be living in urban areas. Taking into consideration that

land losses, caused by massive in un dations an driver bank erosion, are a most probable consequence of climate change in Bangladesh, the problem of a steadily growing population is even more accentuated when adding the prospects of a shrinking land to it.

Table 3.1: Major disasters and their consequences at a glance

Annual disasters	Floods, Tropical Cyclones, Tornadoes, Tidal bores, Riverbank Erosion, Drought
1947 – 1988	13 severe Cyclones hit Bangladesh. The country is affected by Cyclones 16 times a decade (on average).
Consequence	Loss of life and property, change in living pattern
Problems	Climate Change, Population Density, Poverty, etc.

Source: Das, 2010

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 (Climate Change Cell, September 2007)

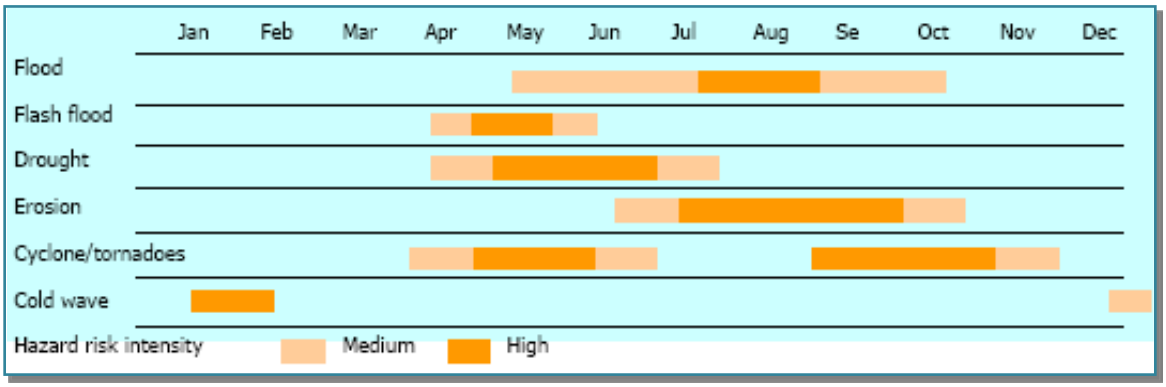

Figure 3.2: Climate Hazard Calendar of Bangladesh

Source: Climate Change Cell, 2007

Bangladesh is exposed to a long list of natural hazards, such as, floods, river erosion, cyclones, droughts, tornadoes, cold waves, earthquakes, drainage congestion/ water logging, arsenic contamination, salinity intrusion etc.

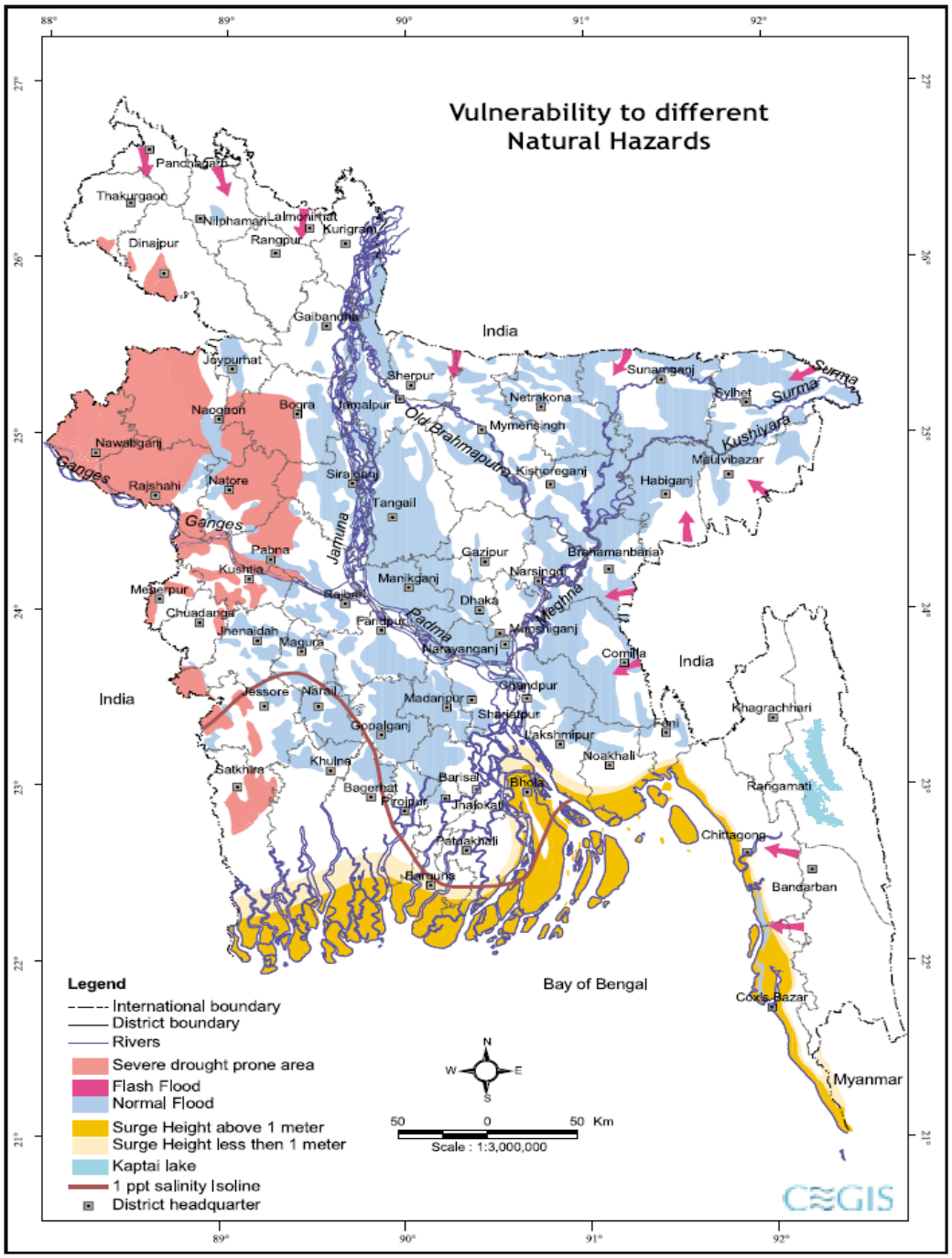

Figure 3.3: Showing all kinds of Natural Disaster Prone Areas of Bangladesh
Source: CEGIS, 2007

3.2.3.1 Flood

Flood is almost an annual event in Bangladesh. It is the most severe during July and August. Regular river floods affect 20% of the country. There are past incidences of its increase up to 68%. Approximately 37%, 43%, 52% and 68% of the country is inundated with floods with of return periods of 10, 20, 50 and 100 years respectively (MPO, 1986). Flood in Bangladesh is categorized as-

(i) Monsoon flood - increases slowly and decreases slowly, inundate vast areas and causes huge loss to the life and property;

(ii) Flash flood - from sudden torrential flows, following a brief intense rainstorm;

(iii) Tidal flood - short duration, height is generally 3-6m;

(iv) Rain flood - caused by drainage congestion and heavy rain.

The following map shows the zones of different categories of floods in Bangladesh.

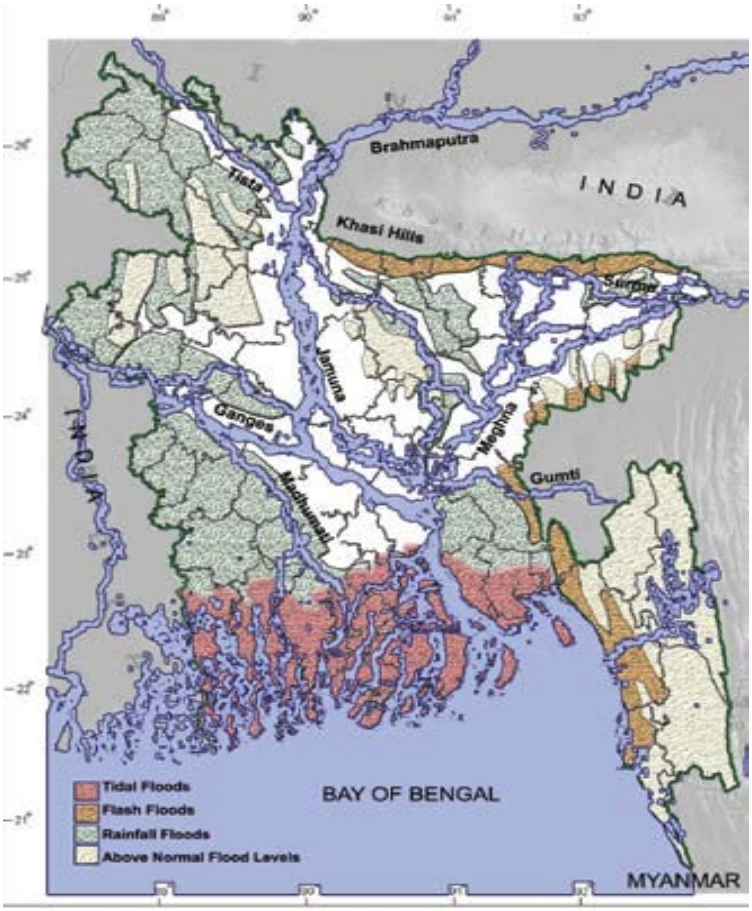

Figure 3.4: Flood types in Bangladesh
Source: NPDM, 2008-2015

Major Floods in Bangladesh

There are some major floods which had devastating impacts on our country. Last 25 years there are mainly 6 major floods in Bangladesh. Amounts of loss of lives and resources were huge.

Table 3.2: Serious floods in the last 25 years

Event	Impact
1984 flood	Inundated over 50,000 sq. km, estimated damage US$ 378 million
1987 flood	Inundated over 50, 000 sq. km, estimated damage US$ 1 billion, 2,055 deaths
1988 flood	Inundated 61% of the country estimated damage US$ 1.2 billion, more than 45 million homeless, between 2,000-6,500 deaths
1998 flood	Inundated nearly 100,000 sq. km., rendered 30 million people homeless, damaged 500,000 homes, heavy loss to infrastructure, estimated damage US$ 2.8 billion, 1,100 deaths
2004 flood	Inundation 38%, damage US$ 6.6 billion, affected nearly 3.8 million people. Estimated damage over $2 billion, 700 deaths
2007 flood	Inundated 32,000 sq. km, over 85,000 houses destroyed and almost 1 million damaged, approximately 1.2 million acres of crops destroyed or partially damaged, estimated damage over $1 billion, 649 deaths

Source: Bangladesh Climate Change Strategy and Action Plan, 2008

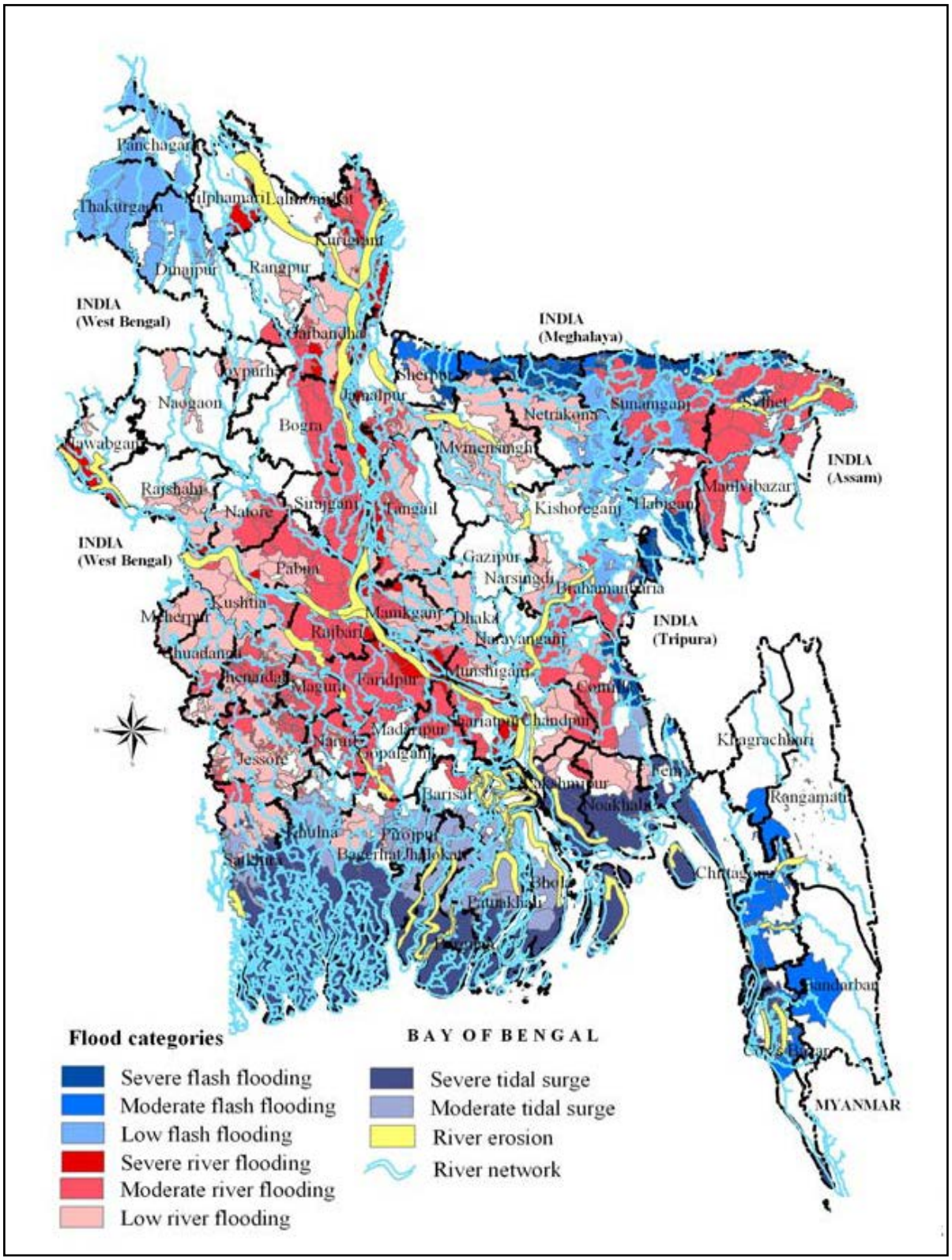

Figure 3.5: Showing areas which are vulnerable to flooding
Source: Climate Change Cell, 2007

3.2.3.2 Cyclone

The coastal belt of Bangladesh is frequently hit by devastating cyclones. These are usually with high-speed winds, sometimes reaching 250 km/ hr or more and 3-10m high waves, causing extensive damage to life, property and livestock. While cyclone destroys most of the vernacular buildings, very few permanent structures made in brick and RCC have been destroyed by the wind load. However, tidal wave sweeps away even such structures unless they are specially designed for water load, which is highly expensive. Careful site selection by considering the tidal surge map supplied by Meteorological Department is the most prudential way of protecting buildings from tidal waves.

Bangladesh is well known for its tropical cyclones from the Bay of Bengal accompanied by storm surges. These are one of the major causes of disaster in Bangladesh. The country is one of the worst sufferers of all cyclonic casualties in the world. The high number of casualties is due to the fact that cyclones are mostly associated with storm surges. Storm surge height in excess of 9m is not uncommon in this region. For example, the 1876 cyclone had a surge height of 13.6 m and in 1970 the height was 9.11 m (WARPO, 2005). Among all others, the 1970 Cyclone was the most damaging, with a wind-speed of about 224 km per hour and associated storm surge of 6.1 to 9.11 Meters. It had killed about 3, 00,000 people. (Das 2010)

Table 3.3: Major Cyclones in Bangladesh

Date	Maximum Wind Speed (km/ hr)	Storm Surge Height (Meter)	Death
11 May, 1965	161	3.7-7.6	19,279
15 Dec, 1965	217	2.4-3.6	873
1 Oct, 1966	139	6.0-6.7	850
12 Nov, 1970	224	6.0-10.0	300,000
25 May, 1985	154	3.0-4.6	11,069
29 Apr, 1991	225	6.0-7.6	138,882

Source: National Plan for Disaster Management 2010-2015

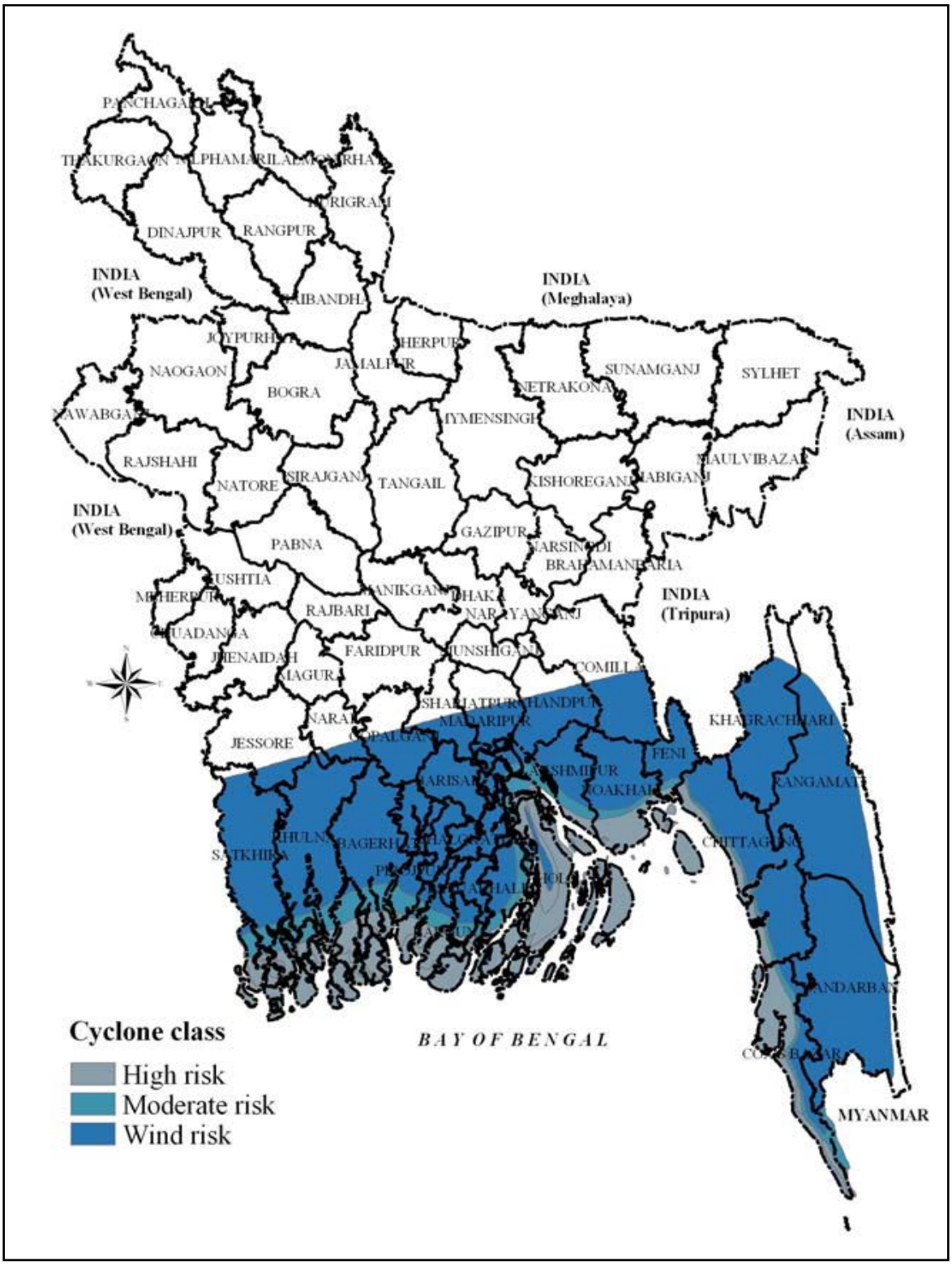

Figure 3.6: Areas which are vulnerable to Cyclone
Source: Climate Change Cell, 2007

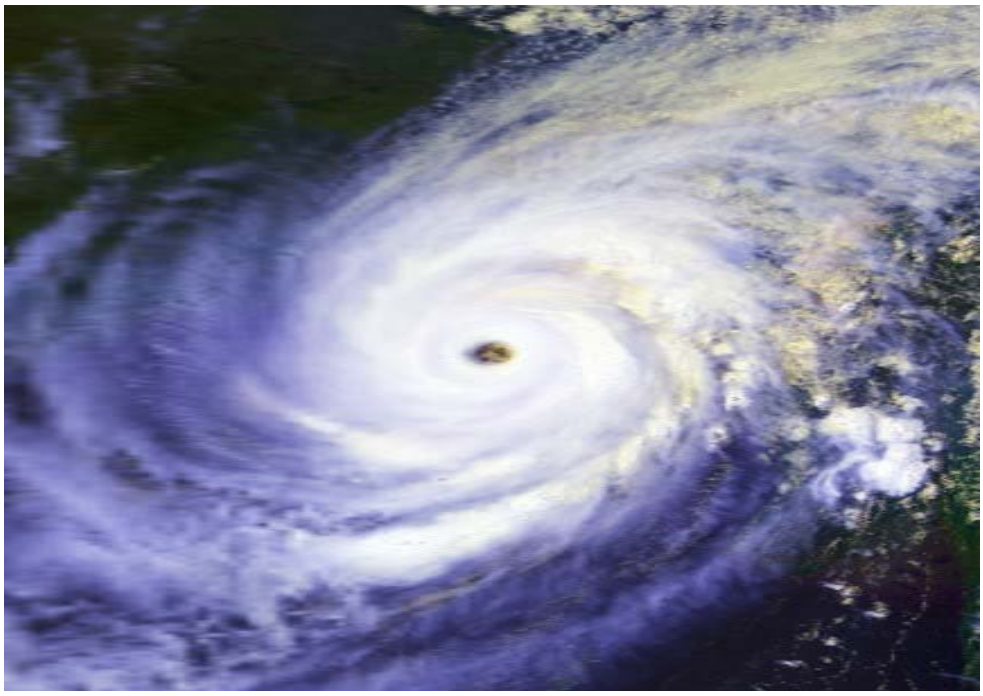

Figure 3.7: the eye of the catastrophic storm (satellite image)
Source: NOAA

In April 1991, a cyclone struck Bangladesh, claiming lives and leaving destruction in its path.

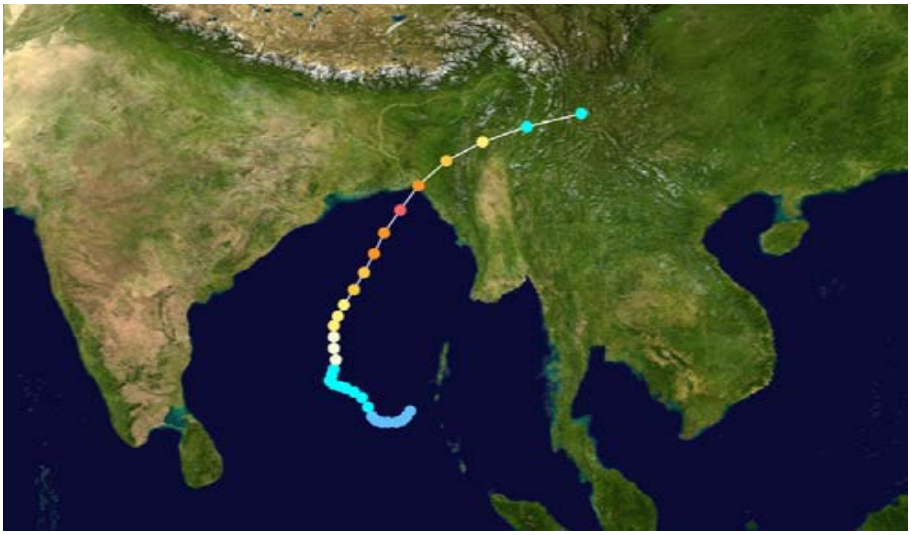

Figure 3.8: the track of cyclone in November, 1970
Source: NOAA

The Fig: 3.8 describe the track, its increased intensity at land fall. The worst cyclone in recorded history on mortality count struck Bangladesh in November 1970.

Table 3.4: Cyclone at different time period in Bangladesh

Date of Occurrence	Nature of Phenomenon	Landfall Area	Maximum Wind Speed in kph.	Tidal Surge Height in ft	Central Pressure (mbs)	Loss/ Damage
2000 28.10.2000	Deep Depression (Probably Cyclonic Storm)	Sundarban coast near Mongla	50-60 kph	2-4 ft	-	People killed =3 Fishermen reported missing = About 250 Houses reported damage = 3,000
2001 16-10.2001	Severe Cyclonic Storm	Andhra coast	65-85 kph	-	996 hpa	Weakened into a depression
2002 12.11.2002	Cyclonic Storm	Sundarban coast near	65-85 kph	5-7 ft	998 hpa	People killed =2
		Raimangal river				Fishermen reported missing = About180 Houses reported damage = 1,000
2003 20.5.2003	Cyclonic Storm	Myanmar coast	65-85 kph	3-5 ft	-	Weakened into a depression No causalities was reported
2003 16.12.2003	Severe Cyclonic Storm	Andhra coast	98-115 kph	-	992 hpa	No causalities was reported
2004	Cyclonic	Cox's Bazar – Akyab	65-90 kph	2-4 ft	990 hpa	26 small boats with fishermen were
19.5.04	Storm	Coast				reported missing
2007 15-16 Nov	Severe Cyclone SIDR	Baleshwar River	223 KPH	12-15 ft	940 hPa	People killed: 3,363 People injured: 55,282 People affected: 89,23,259 People missing: 871 Cattles & Poultry killed: 17,78,507 Crops damaged totally: 7,43,321 acres Affected bridges/culverts: 1,687 Upazillas affected: 200 Unions affected: 1950 Houses damaged: 5,64,967
May 25, 2009	Cyclone Aila	-	100 kmph	-	-	about 200 people are dead 1,120 people are still missing 200,000 people are trapped in water About half a million people had to leave their homes and go to temporary shelters

Source: Bangladesh Meteorological Department (BMD), 2009

Cyclone "SIDR" 2007

Cyclone "SIDR" was one of the 10 strongest cyclones to hit Bangladesh between 1876 and 2007. "SIDR" developed in the Bay of Bengal in early November2007. It further intensified into a category 4 storm system (on the Saffir-Simpson Scale) with peak sustained winds of up to 215 km/h (135 mp/h) (peaking at 260 km/hour). The cyclone made landfall in Bangladesh in the evening of November 15, 2007. SIDR and its surge resulted in thousands of deaths and massive destruction of coastal communities.

Most of the cyclones that have made landfall in Bangladesh in the past have caused thousands of deaths. "SIDR" was no exception. According to official accounts 3,447 people lost their lives. However this is believed to be inaccurate. The actual death toll may never be known with certainty. It is estimated that perhaps up to 10,000 people actually lost their lives, with thousands more injured, or missing. Thousands more were displaced and became homeless. (http://www.drgeorgepc.com/Cyclone2007BangladeshSIDR.html)

Tornado

Local severe storms take place during the two transition periods between southwest and northeast monsoons over the Indian sub-continent. These are referred to as pre-monsoon (March-May), and post-monsoon (October- November) incidences. During the pre-monsoon period most of the abnormal rainfall or drought conditions frequently occur in different parts of Bangladesh. Also there are severe local seasonal storms, popularly known as nor'westers. Some of these are associated with tornadoes. (Das, 2010)

While wind-speed in a nor'wester may exceed 162 km/hr, they are generally within 113-130 km/hr. When the winds become whirling with funnel shaped clouds having a speed of several hundred kilometers per hour, they are called tornados. They can also cause a lot of destruction. Tornados are suddenly formed and are extremely localized in nature and of brief duration. Thus, it is very difficult to locate them or forecast their occurrence with the techniques available at present. However, high-resolution satellite pictures, suitable radar, and a network of densely spaced meteorological observatories could be useful for the prediction or for issuing warnings of nor'westers and tornados. (Das, 2010)

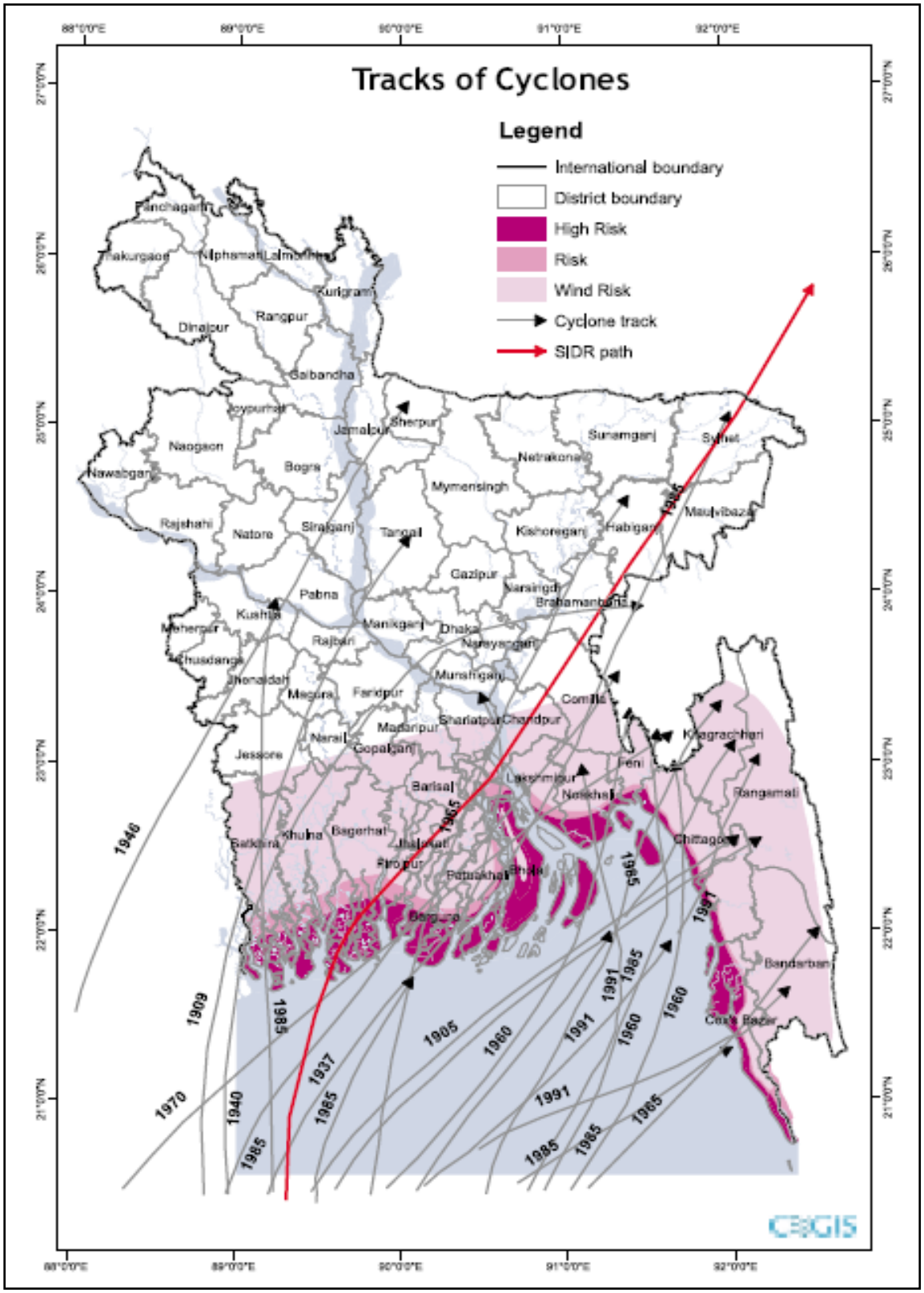

Figure 3.9: Showing different track record of Cyclone
Source: CEGIS, 2008

3.2.3.3 River Bank Erosion

The impacts of river erosion are long term. It takes a few decades to make up the losses for a family. In Bangladesh, there has been inadequate progress towards improving the erosion-affected people primarily due to resource constraint.

Rivers in Bangladesh are highly dynamic.

Sometimes the main rivers form islands or chars between channels. Many such Chars (fertile land) are inhabited. The people live there with a philosophy of "move with the flow". Many of these Chars are extremely sensitive to changes in the river conditions.

According a study in 1991, out of the 462 administrative units in the country, 100 were affected by some form of riverbank erosion, of which 35 were serious, and affected about 1 million people on a yearly basis. Around 10,000 hectares land is eroded by river per year in Bangladesh (NWMP, 2001). Kurigram, Gaibandha, Jamalpur, Bogra, Sirajganj, Tangail, Pabna and Manikganj districts are the erosion prone zones of Bangladesh. Along Padma River, there are erosion prone districts such as Rajbari, Faridpur, Manikganj, Dhaka, Munshiganj, Shariatpur and Chandpur.

Geography and Environmental Science Department of the Jahangirnagar University presented a chart of the losses of river erosion between 1996 to 2000, that is as follows,

Table 3.5: River Erosion at different time period in Bangladesh

Year	Financial Loss	Affected areas	Affected population
1996	5809 m	71680.4 Acres	10103635
1997	33012 m	7756 Acres	173090
1998	2201 m	41519 Acres	321000
1999	10535 m	227755 Acres	899275
2000	3286 m	219310 Acres	415870

Source: Geography and Environmental Science Department of the Jahangirnagar University, 2009

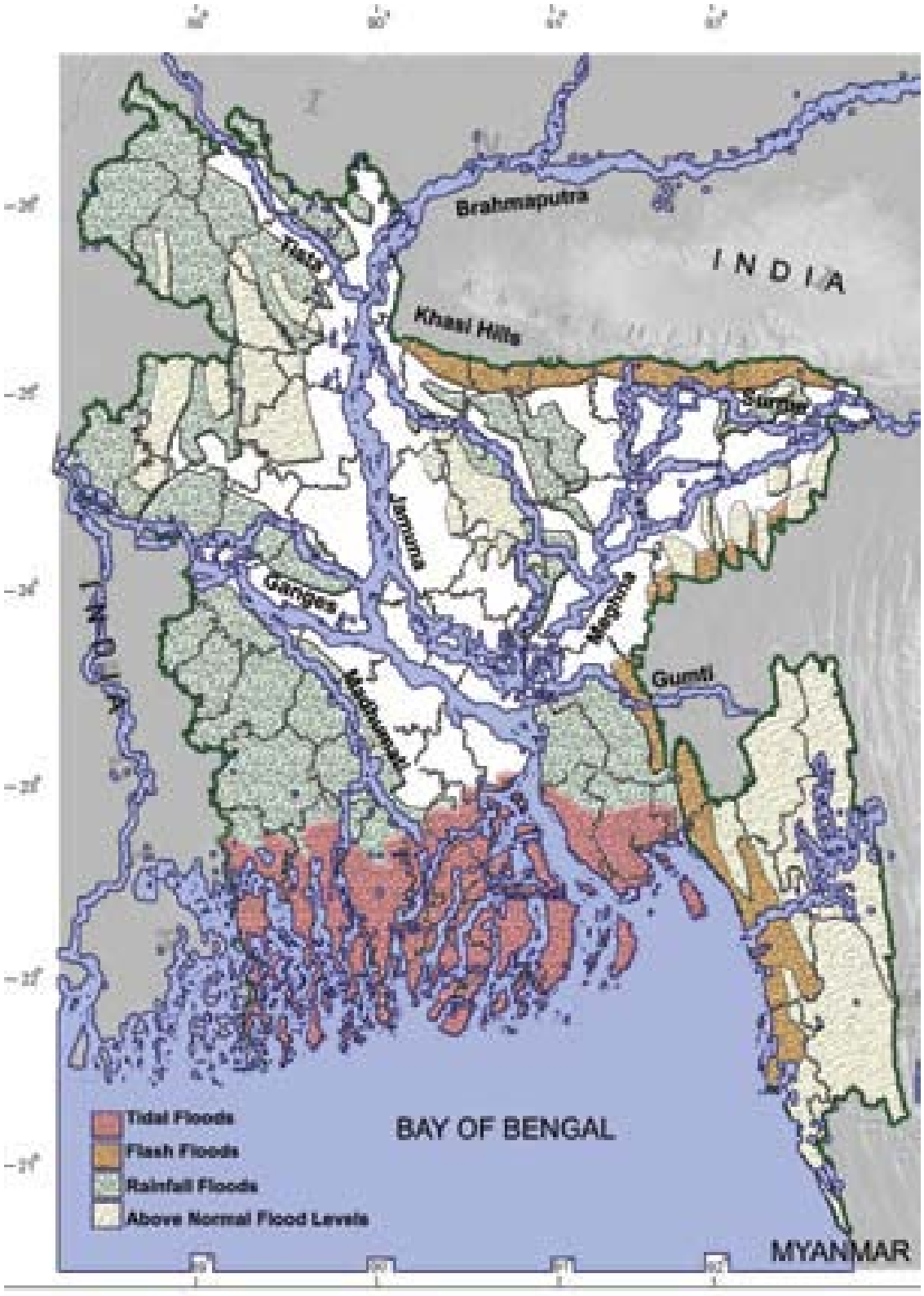

Figure 3.10: River Erosion prone areas. The red areas are prone to River Erosion
Source: NWRD 2001

3.2.3.4 Drought

A drought is an extended period of months or years when a region notes a deficiency in its water supply. Generally, this occurs when a region receives consistently below average precipitation. It can have a substantial impact on the ecosystem and agriculture of the affected region. Although droughts can persist for several years, even a short, intense drought can cause significant damage and harm the local economy.

Droughts are not always continuous in any area, they do occur sometimes in the low rainfall zones. Rajshahi and Dinajpur regions are the most vulnerable areas for drought and heat wave which occur during the months of May and June. Drought affects not only the seasonal crops but also the fruit-bearing trees, forestry and the environment as a whole. Drought causes enormous suffering to the people. (Das, 2010)

In comparison with floods and especially cyclones, droughts are slow to manifest themselves and are relatively more pervasive. Typically, uncertainty of rainfall during pre-kharif and prevalence of dry days and lack of soil moisture during the dry season reduce potential yields of *B. aus, T. aman,* and *rabi*crops. Depending on the intensity of drought, estimated yield reduction of different crops varies from 10 to 70 per cent. A severe drought typically affects crop production in about 30 per cent area of the country, reducing crop yields by an average l0 per cent (Ericksen, Ahmed, & Chowdhury, 1997).

According to NAPA (2005) the frequency and intensity of drought will increase due to Climate Change. Map 3.7 shows the projected drought prone areas of Bangladesh in 2030.

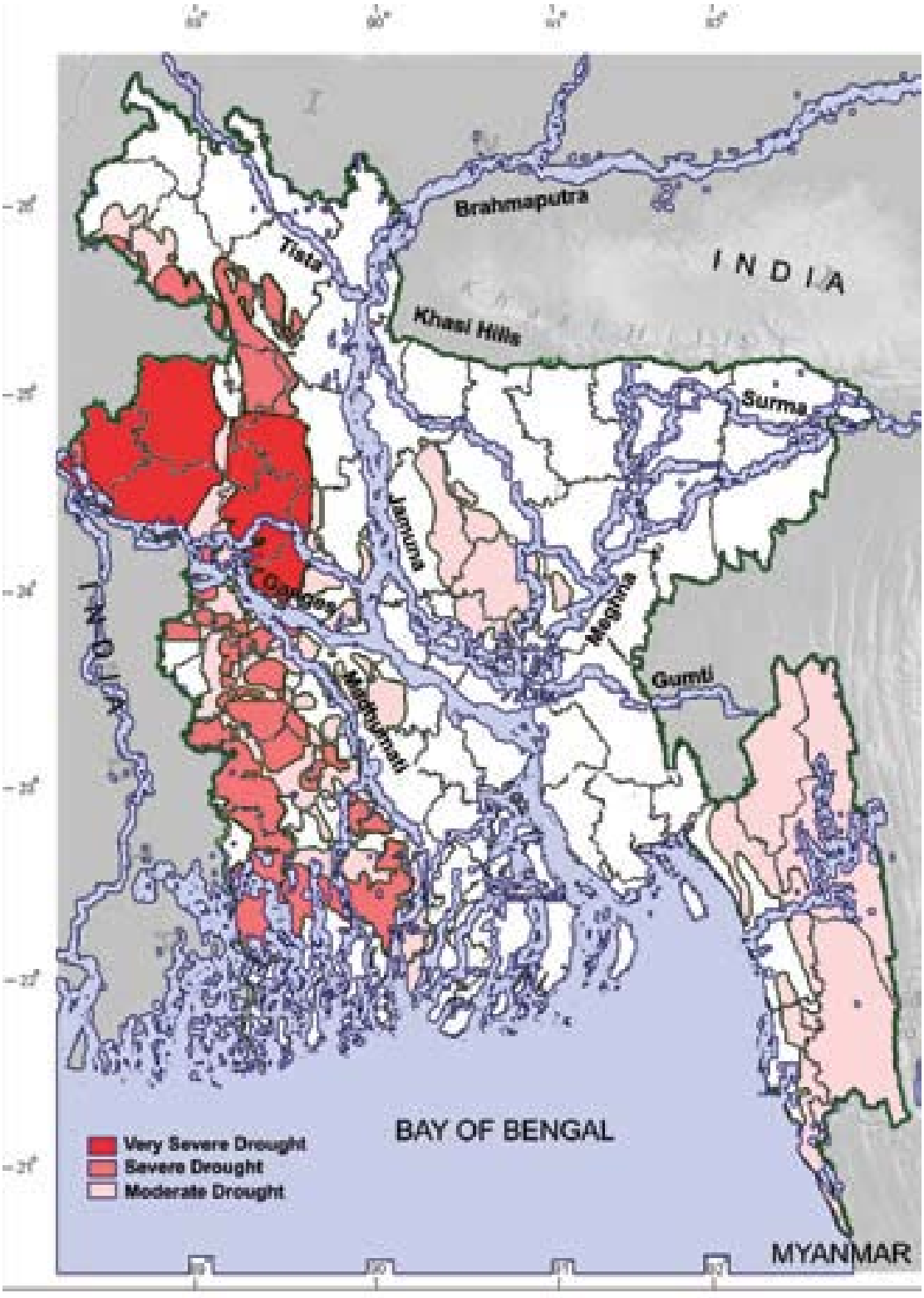

Figure 3.11: Possible Drought affected areas in 2035
Source: NAPA, 2005:15

3.2.3.5 Earthquake

Bangladesh and the north eastern Indian states have long been one of the seismically active regions of the world, and have experienced numerous high magnitude earthquakes during the past 200 years. The catastrophic earthquakes of 1762 and 1782 are believed to have been partially responsible for the diversion of the main flow of the Old Brahmaputra River from the west to present Jamuna River and main flow of the Arial Khan River to the present Padma channel. Since 1860 over 20 shallow and intermediate earthquake-epicentres have been recorded in Bangladesh and the surrounding areas. (Das, 2010)

Bangladesh is extremely vulnerable to seismic activity, the nature and the level of thisactivity is yet to be defined. In Bangladesh complete earthquake monitoring facilities are notavailable. The Meteorological Department of Bangladesh established a seismic observatory atChittagong in 1954. This remains the only observatory in the country. (*http://www.scribd.com/doc/6956055/Earthquake-in-Bangladesh*, retrieved on 29th January, 2010).

Bangladesh is surrounded by the regions of high seismicity which include the Himalayan Arc andShillong Plateau in the north, the Burmese Arc, ArakanYoma anticlinorium in the east and complex Naga-Disang-Jaflong thrust zones in the northeast. It is also the site of the Dauki Fault system along with numerous subsurface active faults and a flexure zone called Hinge Zone. These weak regions are believed to provide the necessary zones for movements within the basin area. (*http://www.scribd.com/doc/6956055/Earthquake-in-Bangladesh*, retrieved on 29th January, 2010).

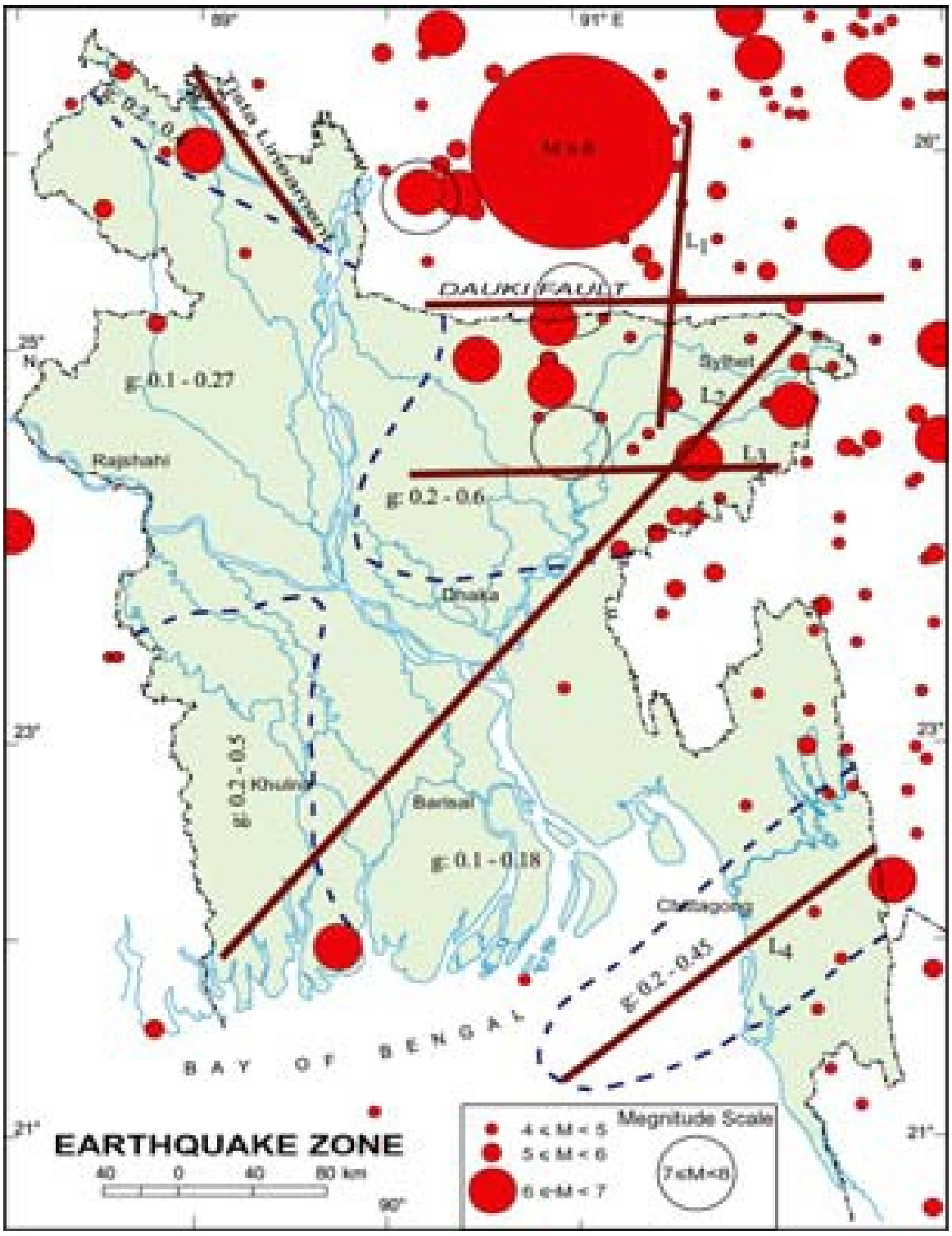

Figure 3.12: Showing the Earthquake prone areas
Source: Climate Change Cell, 2007

3.3 Socio-Economic Status of theMigrants

The interaction between society and climate is ongoing. In the long-term, both climate and society vary and change, as do relationships between them. In the shortterm, a significant change in climate may impact on resource uses in an area, beneficially or detrimentally.

Socioeconomic status is an economic and sociological combined total measure of a person's work experience and of an individual's or family's economic and social position relative to others, based on income, education, and occupation. When analyzing a family's SES, the household income earners' education and occupation are examined, as well as combined income, versus with an individual, when their own attributes are assessed.
(http://en.wikipedia.org/wiki/Socioeconomic_status, retrived on 30th January,2011)

While people move in search of a better life, many have limited or no resources. Opportunities are hard to find when they reach their destination. Many are forced to live in conditions that place them at risk from social and environmental threats. For example, seasonal laborers living in the fields are exposed to sudden cyclones and storm surges, while migrants in cities locating in marginal areas are at risk from floods and diseases associated with overcrowding. Thus, migrants lose the support structures of their place of origin and relocate in areas where these, and job prospects, are poor. Improving the infrastructure and employment opportunities for migrants is critical for reducing their vulnerability. (Ericksen, Ahmad & Chowdhury, 1997)

CHAPTER - IV

4.1 Introduction

Bangladesh is a country which is frequently facing natural disasters and hazards every year. So the rates of environmental migrants are increasing. According to the push and pull factor of migration Dhaka is attracting those people who have lost their land, job and assets by natural disaster or by the impact of natural disaster. In this section the research will show the socio-economic condition before migration and after migration and the major findings. Some other information has shown in appendix.

4.2 Age Structure of the Interviewed Persons

From three study area there are found 300 respondents who have lost their land, Job and assets because of the impacts of natural disaster. Different age groups of peoples have been interviewed. Major portion of the interviewed persons are in the age group of (31- 40) years and its percentage is 37.79%. Second major percentage 28.99% of people are in the age group of (41 – 50) years. Third major portion of the respondents are in the age group of (21-30) years and it is 20.85%.

Table 4.1: Age structure of the interviewed persons

Age group	Percentage
0-10	0.00%
11--20	4.89%
21-30	20.85%
31-40	37.79%
41-50	28.99%
51- above	7.49%

Source: Field survey, 2011

4.3 Education level of the Respondents

According to the field survey most of the respondents have no education. Among all respondents their percentage is 39.46%. 23.51% people can do signature only, 14.59% people have primary education and a very few percentage of people have the secondary

education or high school education (Field Survey, 2011). Table 4.2 is representing the education level of the interviewed persons.

Table 4.2: Education Level of the Respondents

Education Level	Respondents	Percentage
No education	146	39.46%
Signature only	87	23.51%
Primary education	54	14.59%
High school	20	5.41%

Source: Field survey, 2011

4.4 The Disasters they have faced before coming to Dhaka

Environmental migrants have lost their land, home and job for different natural disasters. Bangladesh for its geographical location faces frequent natural disasters. According to the field survey it has came out that there are some leading environmental factors which forced these migrants to migration.

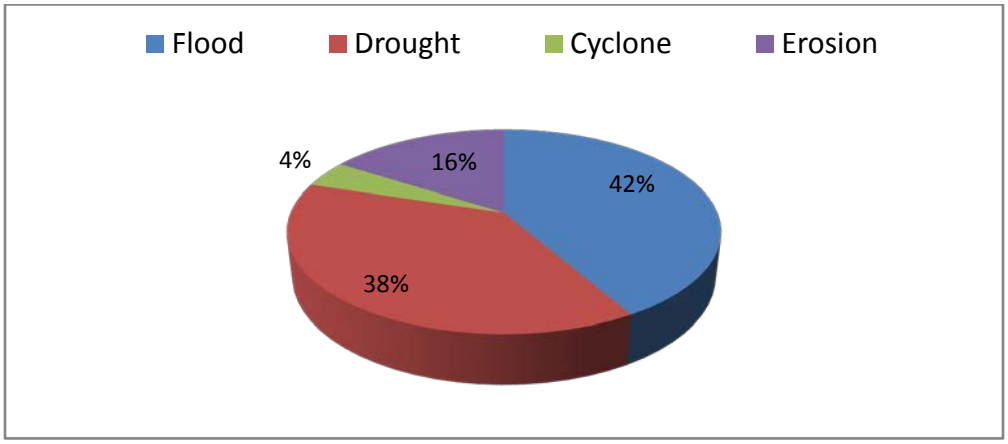

Figure 4.1: Environmental Factors behind migration

4.5 The Reasons behind coming to Dhaka

Natural disasters have many direct and indirect impacts on our life. Environmental migrants are the sufferer of natural disasters. They lose so many things after various disasters. These

are the push factors behind migration to Dhaka. According to the field survey there are categorized those reasons. They are as follows.

Table 4.3: Reasons behind coming to Dhaka

Reason	Percentage
Lost job	41.04%
Lost home	45.93%
Loan pressure	13.03%

Source: Field survey, 2011

4.6 Source of Income of the Respondents

Before Migration

Income pattern before migration was mainly agriculture oriented. 28.99% respondents were engaged in agricultural activities. Second highest occupation is farmer and the percentage is 21.82%. Many other occupations were found such as rickshaw pulling, shopkeeper, power loom, labor, van driver, etc. Table 4.3 is representing the occupation of the environmental migrants before their migration. And figure 4.3 is representing the percentages of different occupation through pie diagram.

Table 4.4: Source of Income before Migration

Source	**Percentage**
Agriculture	28.99%
Power loom	7.49%
Farmer	21.82%
Boatman	1.30%
Rickshaw Puller	9.45%
Shopkeeper	8.47%
Van Driver	2.28%
Labor	9.77%
No Work	10.42%

Source: Field Survey, 2011

Source of Income after Migration

According to the field survey, after migration there comes a huge change into the occupation of the migrants. Most of them earn their livelihood by rickshaw pulling. It is 25.08%. 22.48% people's occupation is day labor. Table 4.4 is describing their occupation after migration.

Table 4.5: Source of Income after Migration

Source	Percentage
Day Labor	22.48%
Rickshaw Puller	25.08%
Van Driver	4.56%
Garments Worker	15.64%
Home Servant	6.19%
Bus Helper	3.58%
Business	1.63%
Flower Seller	0.33%
News paper seller	5.86%
Shop keeper	3.26%
Tailor	1.95%
Tea-seller	0.98%
Security Guard	0.65%
CNG Driver	6.84%
Waste picker	0.98%

Source: Field Survey, 2011

4.7 Income Pattern of the Respondents

Before Migration

To find out the income pattern of the respondents all the respondents according to their income have categorized into five distinct categories. Major portion of the respondents' income was into the range (2001 - 3000)tk their percentage is 36.48%. There are 26.71% peoples income is into (1001- 2000)tk. A few group of people's income is more then 4000 tk. This is the scenario of before migration. They are showing below through table and a pie diagram.

Table 4.6: Income pattern before migration

Amount	Percentage
0 – 1000	10.42%
1001 – 2000	26.71%
2001 – 3000	36.48%
3001 – 4000	19.87%
4001 – Above	6.51%

Source: Field Survey, 2011

Income Pattern after Migration

Huge change has come into the income pattern after their migration. Most of the people's income is into the income group of (3001 – 4000) tk and it is 46.58%. After that 13.36% percentage of people's income range is (2001 - 3000) tk. In urban areas their minimum income is about 1000tk and the highest income is above 7000tk. The income pattern after migration is as follows.

Table 4.7: Income pattern after migration

Amount	Percentage
0 – 1000	0.98%
1001 – 2000	12.05%
2001 – 3000	13.36%
3001 – 4000	46.58%
4001 – 5000	9.12%
5001 – 6000	7.49%
6001 – 7000	5.54%
7001 – Above	4.89%

Source: Field Survey, 2011

4.8 Expenditure Pattern of the respondents

Before Migration

There are differences between the expenditure pattern in rural areas and urban areas. According to the field survey, 2011 there found that their monthly expenditure were mainly within (2001 – 3000)tk and (1001 – 2000)tk and the percentages are 44.30% and 38.76% respectively. Maximum expenditure is found above 4000tk. Expenditure pattern before migration is as follows.

Table 4.8: Expenditure pattern before migration

Amount	Percentage
0 – 1000	1.63%
1001 – 2000	38.76%
2001 – 3000	44.30%
3001 – 4000	12.70%
4001 – Above	2.61%

Source: Field Survey, 2011

Expenditure Pattern after Migration

After migration to the urban area it is found that their expenditure pattern is not same as before. Most of the expenditure is into the range (4001 – 5000)tk and (3001 – 4000)tk and the percentages are 30.62% and 25.08% respectively. Maximum expenditure is found 7001 and above and it is 4.23%.

Table 4.9: Expenditure Pattern after Migration

Amount	Percentage
0 – 1000	0.65%
1001 – 2000	1.95%
2001 – 3000	12.05%
3001 – 4000	25.08%
4001 – 5000	30.62%
5001 – 6000	19.22%
6001 – 7000	6.19%
7001 – Above	4.23%

Source: Field Survey, 2011

4.9 Assets or Savings

Before Migration

In the rural areas according to their income pattern most of the respondents had some saving or assets. Some of them had no savings or assets without having a home to live. According to the field survey 2011, their minimum saving rural areas were 0 taka and the maximum savings were more than 1500 taka per month. They are showing below.

Table 4.10: Assets or Savings (Before Migration)

Amount	Percentage
0 – 500	59.28%
501 – 1000	37.13%
1001 – 1500	2.28%
1501 – Above	1.30%

Source: Field survey, 2011

After Migration

After migration to the urban areas they faced so many difficulties and problems at the beginning but when they have gotten a job or source of income they became hardly able to save some money monthly. According to the field survey it is seen that most of the respondents are able to save (0 - 500) tk and it is 86.68%. In the urban area the minimum saving is 300 taka per month and the maximum saving is above 1500 taka per month.

Table 4.11: Assets or Savings (After Migration)

Amount	Percentage
0 – 500	86.68%
501 – 1000	10.07%
1001 – 1500	2.61%
1501 – Above	0.64%

Source: Field survey, 20

4.10 Housing Condition

Rent paid for Living

When they come to the city they don't have any specific place to live. So at first they take shelter on the road, bus stands, rail stations, etc. After that they start living in the slums which are unhygienic, lack of basic utility services. To live into the slums they have to pay an amount as housing rent. According to the field survey the range of house rent are as follows.

Table 4.12: Rent paid for Living

Rent	Percentage
0 – 500	2.93%
501 – 1000	6.84%
1001 – 1500	43.32%
1501 – 2000	24.76%
2001 – Above	22.15%

Source: Field survey, 2011

4.11 Access to Utility Services and Facilities

Utility services and facilities are the necessary things to live easily. Utility services and facilities include mainly water, electricity, gas, sanitation, etc. The previous and existing condition of these facility services are as follows-

Access to Water Supply

Before migration most of the migrants had to depend on tube-well or another sources of water such as pond, river, cannel, etc. After migration most of them have supplied water, tube-well. According to field survey 2011, 81% of the environmental refugees are getting the supplied water and tube-well facilities.

Access to Electricity

Before migration most of the respondents didn't have any access to electricity facilities. After migration about 89% migrants are getting this facility. Along with the house rent they also

have to pay for electricity supply. Electricity rent per month is (50-300)tk. (Field Survey, 2011).

Access to Gas Supply

Gas supply is not available in rural areas. Most of the respondents didn't have access to gas supply. In the urban area they are getting the facility. But it is not also available in every slum. According to field survey 2011, 68% respondents are getting the gas supply and they are also paying for that.

Access to Sanitation

Before and after most of the respondents were in lack of sanitation or hygienic sanitary latrines. According to the field survey, about 83% of the respondents are getting latrine facilities but they are unhygienic at all.

CHAPTER - V

5.1 Finding of the Analysis

After a huge analysis on the collected primary and secondary data there have came out some findings which is showing the existing and previous socio-economic condition of environmental refugees. On the basis of these analyses there are some findings. These findings are explaining the comparison between previous and present socio-economic condition of the environmental refugees. Some sectors are focusing so brightly the comparisons. They are as follows.

Source of Income

From the analysis on previous and present occupation of the environmental refugees it can be said that a huge changes have came in their occupation. Before coming Dhaka most of them were farmer or agricultural worker. But after coming Dhaka they mainly become day labor and rickshaw puller. It is also clear that income source is higher in Dhaka then the rural areas.

Income Pattern

Changes into the income pattern are seen after migration. As the income source is available in urban areas than the rural areas. People have a lot of options to do for earning their livelihood. So the income is higher in urban areas than the rural areas. According to the analysis of their socio-economic condition it has been seen that before migration their income was lower than the income after the migration. But it takes a few times to settle their source of income after migration to Dhaka.

Expenditure Pattern

Expenditure pattern also changed after the migration. Environmental refugees in their rural life were out of all urban facilities and services. So their expenditure of per month was bounded into food, clothing, etc. But in Dhaka monthly expenditure is high. There are a lot of sectors of expenditure such as food, house rent, utility services cost (water, electricity, gas),

education, transport, health, etc. So the monthly expenditure becomes higher after migration. It is another issue of sufferings of environmental refugees.

Housing or Living Environment

Condition and ownership of housing is changed after the migration. Before migration all the environmental refugees had a permanent home or land to live. In most cases most of the respondents were the owner of the house. But after the migration they don't have any fixed or permanent house to live and they have to pay rent for the houses. House rent is unaffordable or very high naturally. Most of the environmental refugees have to find their living places in the slum areas because shortage or lack of money. Conditions of the houses are so bad or worst. These houses are so congested and don't have any hygienic sanitation system, waste management system. Wastes are through beside the houses. The environmental refugees face housing problems after coming to Dhaka. They are not able to live in a clean and hygienic environment. So they are facing health problems frequently.

Educations

Education pattern changed with the change of living area. According to the field survey it has came to know that, in their origin they have gotten the facilities from government for free education. So their children got opportunity to get educated. But in urban areas this facility is comparatively less.

Not only is this reason, in urban area the cost of living and the expenditure are so high. To meet this all the family members have to engage in earning. The little children who have to go for school are going for work for earning. Migration impacts on their life negatively in this sector.

Health

Health is a matter of peaceful life. But environmental refugees are facing health problems because they are not getting health care properly and are not getting medicines. Health care or health facilities cost is very high in Dhaka city and free health care is not sufficient according to the demand of the poor people. Poor migrated people are unable to bear the high

cost of medical facilities and medicines. But in rural areas or in their origin they have gotten free or cheap health services and medicines.

Assets or Savings

Analysis on assets and savings has represented that, most of the migrants have some fixed and temporary assets before their migration but after migration they are hardly able to save money per month. It is because in urban area monthly cost is so high then the rural area. Having fixed assets is not possible for poor people because land price is out of their reach. Most of them don't have any permanent job and source of income after migration, so they can not save money regularly.

Social Problems

Social status changes with the migration. In their origin place they were not neglected but after migration these jobless, homeless people become neglected to the city people because they are creating pressure on this crowded city.

At the beginning in this city they face harassments from police, hijackers, thieves, etc. As they were not aware about these problems, they lost their money and other thing along them. So they fall upset at this situation and fell helpless. This is another tragic period of them.

5.2 Recommendations

Natural calamities are so well known to us and these calamities are happening frequently. So the number of affected people will include to our society after every calamity or hazards. It is not possible to protect or keep away our country from these natural disasters but we can protect our effected destitute people through proper planning. We can recover them from their losses and can give support so that they don't feel helpless. There are some possible recommendations to control the migration and to improve their condition.

Creation of jobs for the effected people within or around the areas

Environmental refugees are forced to leave their living place or origin. So creation of job facilities within or in the surrounding areas can decrease the rate of the migration and the tendency of migration also. Various project programs to create employment would be important and effective steps towards controlling the migration.

Decentralization of the city

All the development programs and industrializations are occurring by centering the Dhaka city. This is one of the pull factors of environmental migration to Dhaka city. Industries, institutions, factories should be located outside of the city. So that pressure on Dhaka city could be reduced. Various facilities such as organizations, services & facilities and medical facilities need to be decentralized.

Encouraging growth of secondary and satellite cities

Secondary cities growth can divert the concentration of migration and the tendency. Secondary city or satellite city reduce the pressure on the main city or the capital cities.

Target group training

Various training programs can be organized through the government by grouping some targeted people such as the land less people, job less people, people in loan pressure, etc. Training could be on agriculture, horticulture, fisheries and also according to the supporting programs of that area.

Special planning for the environmental refugees

As the numbers of environmental refugees are increasing, special planning by the government is needed. A planning team and a department can be formed to prepare policies for the people who have lost their properties and also implement those plans and policies accurately. The main activities of the department would be to recognize the environmental refugees and to provide them necessary supports to improve their condition according to the plans and policies.

Role of central and local Government

Central government will prepare plans and policies for the affected people and the implementation and maintenance will be through the local government. Local government can implement the plans more effectively. Government should prepare development plan considering the issues of rural development and disaster management as a priority sector to reduce disaster impacts and prevent high rate of rural-urban migration.

Multi loans and saving products

The environmental refugees should introduce multi-dimension savings and loan products such as seasonal loan, educational loan, leasing loan, micro enterprise loan, house loan and savings products. That would be helpful to the environmental refugees for a new beginning.

Involvement of Government and Private Sectors

Government and private sectors jointly can control environmental migration trend and the rate and also can improve their quality. Because government have skilled and non-skilled man power and the private sector can provide the financial support. From planning perspectives public private ownership programs becomes successful. So government and private sectors can take part to improve their condition.

Contribution of NGO's

NGO's can support these people. NGOs can take various programs in the affected areas to employ the effected people and to help them through financially, educationally, etc. Then the poor affected people will not tends to shift to Dhaka city for earning.

Extending urban services to villages

Urban services which attract the rural people to the urban areas need to be extent to the villages. These services will provide them a better living. Socially and economically they will be benefited. So the migrated people who have migrated to Dhaka will be interested to go back to their origin in the rural areas.

Low cost shelter

The affected landless, homeless people need a shelter to live. They search for a shelter which is low cost and affordable. Government can provide them low cost shelter through implementing National Housing Policy 1993 according to the appropriateness with the area and concerning the issues related to the areas of development.

CHAPTER – 6

6.1 Summery of the Research

Bangladesh is well known to natural disasters and hazards because of the frequency of natural disasters. Geographical location of Bangladesh is the prior reason behind it. After a devastating natural disaster the affected people become landless, homeless, jobless. So without shifting to another place preferably urban areas or city they don't have any other options. Migration is not the end of their journey of sufferings. So many struggles start from it. Their life changes, socio-economic condition changes a lot. They face so many problems related to social, economic and environmental. Their social status fall down and they have to live in a poor living condition. So there are some guidelines to control the migration and to improve the socio-economic condition of the migrated people.

6.2 Conclusion

Environmental refugees are the most helpless and shattered people who lost their home or a safe shelter and don't have a permanent address at the end of any disaster. They do not only loss their home but also loss their hope. They become floating people without any shelter, job and assets. In a search of livelihood they step towards any urban area or capital Dhaka from rural. They face the costly urban livelihood. As a result of climate change due to the global warming, population outburst and unplanned industrialization, the rate of environmental refugees are increasing very rapidly. This is one of the most alarming causes that burden modern urbanization, let alone the development of Dhaka city. So this is the time step forward for a new beginning to change the overall condition of the environmental refugees.

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A Comparative Analysis of Socio-Economic Conditions of Environmental Migrants

Questionnaire Survey

Name:
Age: a) 0-10 b) 11-20 c) 21-30 d) 31-40 e) 41-50 f) 51-60
g) 61-70 h) 71-80 i) 81+
Sex: a) male b) female
Location:

1) From where have you come?
a) Zilla:_____ b) Thana:_____

2) When did you come?
a) Year: _____ b) Month: _____

3) Why did you come here? (in detail)
a) Lost job b) Lost house c) Loan pressure d) Other_____(mention)
_____
_____
_____

4) Where are you living now?
_____
_____

5) What is your source of income? (monthly)
a) Before coming to Dhaka_____
b) After coming to Dhaka _____

6) How much do you earn? (monthly)
a) Before coming to Dhaka_____
b) After coming to Dhaka _____

7) How much do you expand? (monthly)
a) Before coming to Dhaka_____
b) After coming to Dhaka _____

8) How much do you save? (monthly)
a) Before coming to Dhaka_____
b) After coming to Dhaka_____

9) Have you improved your condition? (if yes, then how)
a) Yes b) no
_____
_____

10) How many people are dependent on you? Where they live?
_____
_____

Detail information about the family members:

Family member no. (please put a tick)	Relation	Age	Education level	Occupation	Income
1					
2					
3					
4					
5					
6					

11) Are you happy with your profession? a) Yes b) no , if no then what will you prefer?

_____

_____

_____

12) What is your total amount of fixed asset?

a) Before coming to Dhaka_____

b) After coming to Dhaka_____

13) Do you still get the support from your assets? a) yes b) no , if yes then how much?

_____

14) Are you getting any help?

a) From government_____

b) From NGO_____

c) Other_____

15) Do you want to go back to your village? a) yes b) no

If yes then, why?

_____

_____

If no then, why?

_____

_____

What would be your requirement?

_____

_____

Present scenario on Living Condition:

16) For how long are you living here?

_____

Did the living condition change here? a) yes b) no , if yes then how? (density, facility, social status etc.)

_____

_____

_____

17) Do you pay any rent? a) yes b) no , if yes then how much?_____

18) Did the rent change here? a) yes b) no , if yes then how much?_____

19) Health problem: a) yes b) no , if yes then what is the problem in detail:_____

_____

20) Medical facility: a) From government b) From NGO c) Other_____(mention)

21) Do you have water supply? a) Yes b) no , if yes, then are you charged? a) yes b) no , if yes then how much? _____/month

22) Do you have gas connection? a) Yes b) no , if yes, then are you charged? a) yes b) no , if yes then how much? _____/month

23) Do you have electricity? a) Yes b) no , if yes, then are you charged? a) yes b) no , if yes then how much? _____/month

24) Do you have sanitation facility? a) Yes b) no , if yes, then are you charged? a) yes b) no , if yes then how much? _____/month

25) If there is sanitation facility present then what is the condition? a) hygienic b) unhygienic in detail_____

26) Do you have security problem? a) Yes b) no , if yes, then what do you do please explain in detail?

_____

_____

27) Do you face any harassment from the Police? a) Yes b) no , if yes then what type of?

_____

28) Are you involved with any political activity? a) Yes b) no , if yes then what type of?

_____

29) Do you have any recommendation?

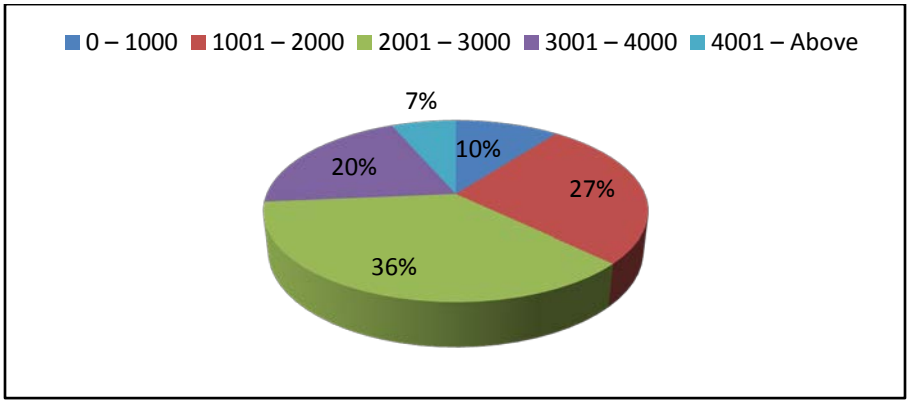
_____

_____

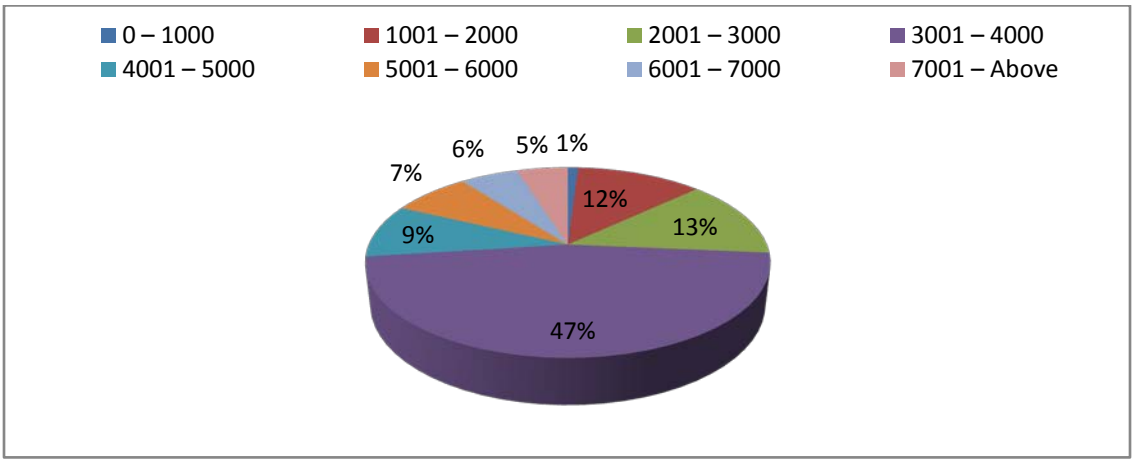
With thanks

Signature of the interviewer with date:

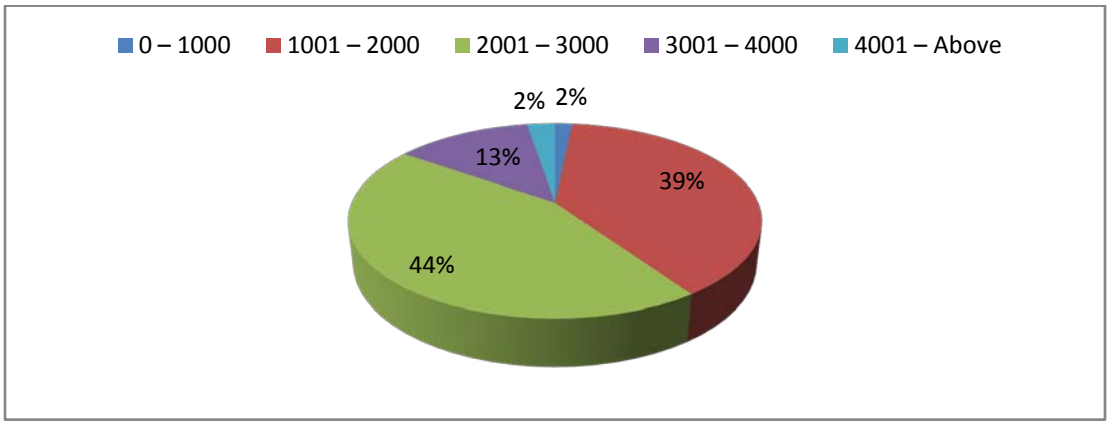
Appendix-2



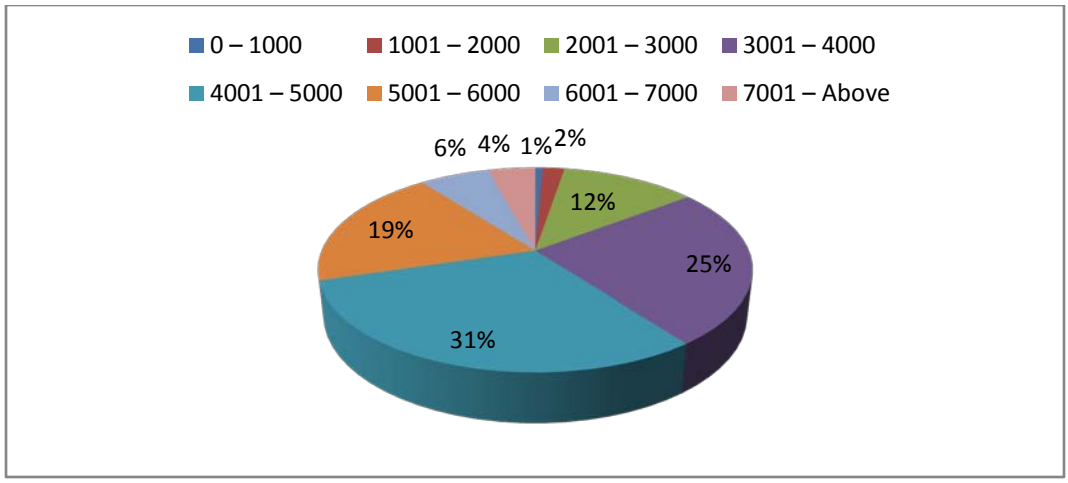
Income pattern before migration



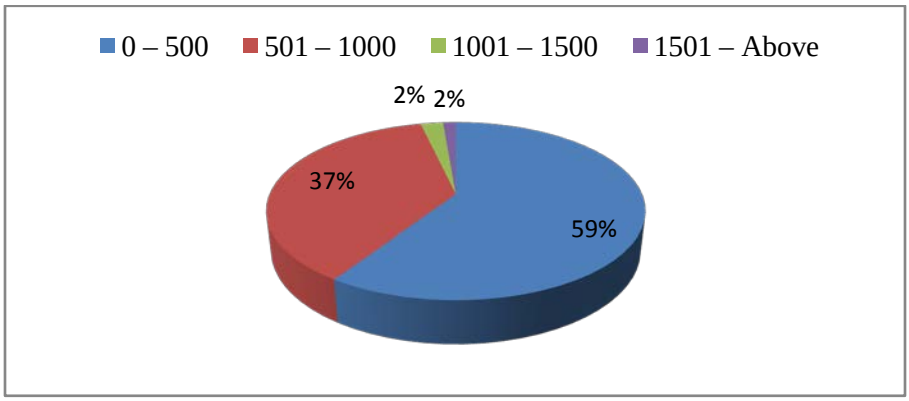
Income pattern after migration



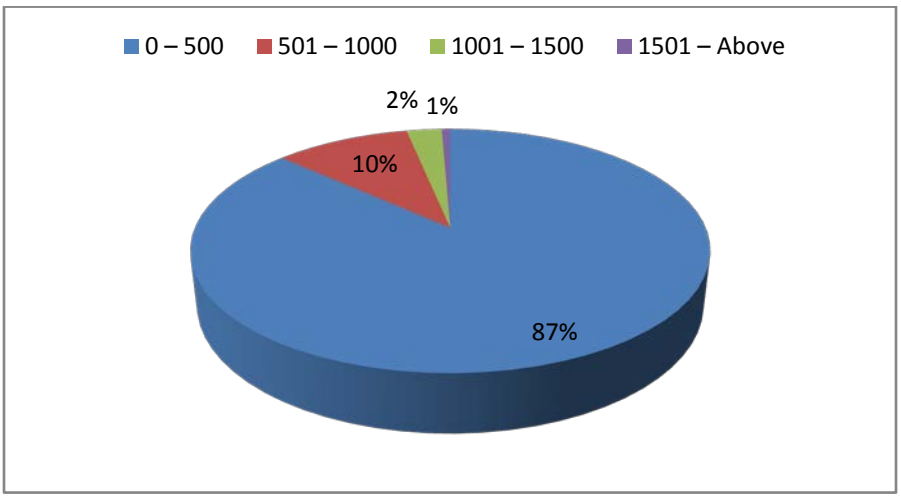
Expenditure pattern before migration



Expenditure Pattern after Migration



Assets or Savings (Before Migration)



Assets or Savings (After Migration)