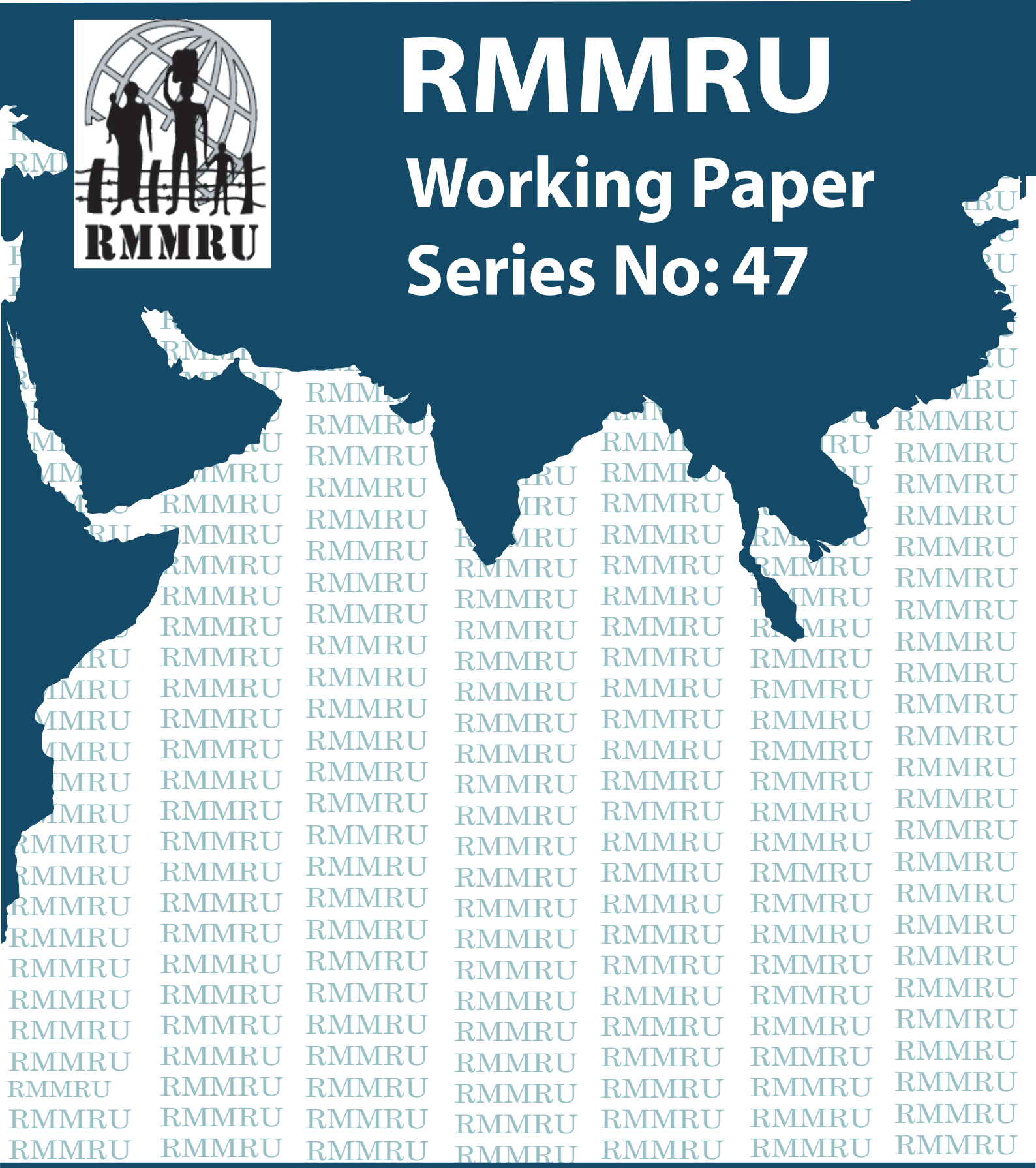

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The role of labour migration in climate change adaptation in Bangladesh with a special focus on the Chittagong Hill Tract region

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ICIMOD

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Tasneem Siddiqui

Acronyms

BMET- Bureau of Manpower Employment and Training
BCAS- Bangladesh Centre for Advanced Studies
BOEP- Bangladesh Overseas Employment Policy
BCCSAP- Bangladesh Climate Change Strategy and Action Plan
CHT- Chittagong Hill Tracts
DEMO-District Employment Manpower Offices
DRR- Disaster Risk Reduction
EPZ- Export Processing Zone
GOB- Government of Bangladesh
HH- Household
IM-Internal Migrant
KII- Key Informant Interviewees
MOEF-Ministry of Environment and Forests
NAPA- National Adaptation Programme of Action
STIM- Short term International Migrant
TTC- Technical Training Centre

Content

Executive Summary

In recent past, few important studies (Martin et al., 2014; Siddiqui and Billah, 2014) identified that environmental change is one of the factors that influence decisions of people in Bangladesh to migrate or not to migrate. However, hardly any study existed that looked into the influence of environmental change in migration decision in Chittagong Hill Tracts region. This paper aims to understand the role of labour migration in increasing local level adaptation capacity of people in the backdrop of climate and environmental hazards in the CHT.

The study used the Foresight (2012) conceptual framework. The framework treats migration as a highly complex non linear phenomenon. It listed five macro drivers that influence migration outcome. These are environmental, social, economic, demographic and political. Different group of people experience the influence of these drivers differently. Along with these, series of intervening facilitators or obstacles and personal and household characteristics interact with each other and produces decision to migrate in case of some individuals or group of people and in case of some other not to migrate.

The study used both secondary and primary sources. It reviewed various government policies that are linked to climate change, migration and development. It gathered primary data through Key Informant Interviews in 27 villages of two CHT districts and one plain land district- Rangamati, Khagrachari and Chittagong. It also conducted interview members of 344 internal, international and non migrant households.

The study found that both the Chittagong Hill Tracts and the plain land Chittagong region were facing various climatic and environmental hazards in the form of irregular, less and heavy rainfall. In terms of environmental hazards the CHT was facing deforestation, landslides, drought and flood; whereas plain land Chittagong was experiencing major river bank erosion. In facing the impacts of climatic and environmental hazards, people followed different autonomous adaptation strategies. Only example of external intervention was rain water harvest projects. In plain land Chittagong affected people faced the challenge of river erosion again autonomously, by shifting to less erosion prone or erosion free areas.

Along with other reasons, climatic and environmental hazards threatened some of the traditional livelihoods. Jhum cultivation was still being practiced by a section of the population. However, new types of crops are being produced. Instead of paddy and potato they are producing turmeric, tobacco; as they required less water. Moreover, both crops provide better economic return. Changes in livelihoods were also occurring in plain land Chittagong. River erosion led to reduction of agricultural land. A section of people turned in to fishermen, boatmen, petty trader, shop keeper, rickshaw puller, driver etc.

Labour migration was all along a livelihood strategy for a section of households from plain land Chittagong. However, traditionally migration for livelihood was almost nonexistent in CHT. In the face of climate and environmental change and other economic, social, and demographic challenges the practice of livelihood migration increased manifold in both CHT and plain land Chittagong. In case of CHT internal migration is becoming common whereas for Chittagong both internal and international migration has become common. Members CHT HHs are migrating to EPZs located in Chittagong as well as to Dhaka; mostly to join the garment and other manufacturing sectors and security providing agencies. From plain land Chittagong people are migrating both internally and internationally. They mainly migrate to Gulf and other Arab ecountries.

The study found that migration decisions of people of Chittagong, Khagrachari and Rangamati was influenced by economic, social, demographic, environmental and to some extent political factors. However even after facing same types of hazards some people from these areas decided to move and some other decided to stay back. Individual or household attitude towards migration, attachment with place of origin, family size of the households, availability or non availability of working age male population within the household, determined if a household would send one or two members to work and earn a livelihood outside the village. Along with individual and household characteristics, access or lack of access to migration information, having or not having any known person in destination, access or lack of access to social network, allowed some households to decide in favour of migration or some other households against migration. Ability or inability to bear the migration cost again determined the destination of the migrants.

A comparison of socio economic indicators of internal, International and non migrant HH showed that short term international migration (STIM) HHs are better off in most of the cases.

This group was major consumers of electricity; and the use of water sealed toilet were higher among them. Tubewell and deep tubewell were the sources of almost 100% for all type of migrant and non migrant HH of plane land Chittagong, whereas in case of Rangamati and Khagrachari the use of tube well was less than 50%. Primarily this is because of the geophysical characteristics of CHT. Naturally the layer of water is way down in CHT than the plain land. People with low income found it costly to install them. Moreover, growing drought situation in some of the villages made it difficult to extract water using tube well and deep tube well.

The study reviewed policies related to climate change, disaster, overseas migration, and development found that none of the policies included CHT climate change issues in their respective instruments. They also did not consider migration as one of many adaptation tools. Rather they generally treated migration as one of the threats of climate change.

Our study demonstrate that a section of the people particularly whose livelihood was affected by climate extreme events e.g flood, drought, cyclones etc have already used labour migration as one of the tools for adaptation or coping mechanism. Based on their experiences this study recommends that both internal and international labour migration can be used as one of the climate change adaptation tools along with different local level adaptation programmes. Some concrete measures are required to allow affected HH to choose migration as one of the many adaptation tools in the context climate and environmental change in CHT.

While formulating programmes for the next phase of National Adaptation Programme of Action (NAPA), environmental and climatic concerns of CHT should be incorporated. In the mean time CDMP has initiated developing a national strategy on internally displaced persons. The strategy is prepared from a right based approach and the goal is to provide assistance in three stages of displacement i.e pre, during and post disasters. Climate change funds including the climate change trust fund, Bangladesh Climate Change Resilience Fund (BCCRF) can be used in the urban locations particularly in slum areas for providing better living conditions to low income internal migrants

Bangladesh needs to develop an internal migration policy. Special attention should be given to ensure that CHT as a region is well reflected in that policy. Measures should be taken to set up

the offices of migration processing agencies, technical training centres so that potential migrants can take up their services.

The migrants from CHT were mostly men. They had information on male labour market. Special programmes needs to be designed to provide such information to aspirant female migrants.

The Overseas Employment Policy should incorporate climate change issue.
The upcoming 7th five year plan should adequately account development stresses created by climatic and environmental hazards in CHT and allocate resources adequately in this respect. It should also plan to develop the farm e.g horticulture, and other non farm sectors e.g tourism development to provide more employment opportunities for people who intend to pursue their livelihoods in CHT.

Introduction

Bangladesh is one of the most climate stressed countries in the world (Ali, 2010). Erratic rainfall along with heavier shower in short duration and rise in temperature has led more intense and regular visit of climate extreme events e.g. flood, cyclones, drought etc in Bangladesh. Climate change impacts ecosystem in a major way that also affects people's lives and livelihoods in Bangladesh. People particularly who pursue agriculture, water and forest based livelihoods were found mostly vulnerable to climate change impacts (GoB, 2009). Studies found that people are following different strategies to adapt with the climate change impacts in Bangladesh. Migration has been found as one of the many adaptation tools through which people ensure constant household income. Apart from cash inflow, migration also brings important remittance in kind such as knowledge, skills, technologies, and values. These together help migrant's households develop their adaptation strategies at local level. In many cases migrant households were found more resilient to climate change impacts than non migrant households (Martin et al., 2014; Siddiqui and Billah, 2014).

Against this backdrop, this paper focuses on the Chittagong Hill Tracts region which is home of 12 ethnic groups. CHT is a distinct region which is completely different from the rest of the Bangladesh because of its topography, socio-economic and cultural attributes of ethnic groups. There are scientific studies that confirmed that likewise other parts of the Bangladesh, the region's climate and environment have been undergoing through a slow but steady transformation which have been affecting the entire ecosystem of the CHT. However, through survey of secondary literature, the study found that very little knowledge has been generated so far on the impact of climatic and environmental hazards on the livelihoods of people of this region. There is also lack of knowledge on the livelihood driven migration trend and pattern in CHT, though many studies are available that focused on forced migration and displacement particularly caused by long standing conflict between the ethnic groups and subsequent Bengali settlers in CHT.

This paper is mainly a scoping study that aims to understand the role of livelihood migration in increasing local level adaptation capacity of people against climatic and environmental hazards in the Chittagong Hill Tracts region. It provides a comparative assessment of the role of labour

migration in diversifying household income and building adaptive capacity in the plain land Chittagong district. It attempts to identify the major climatic stresses in the CHT, their impacts on people's livelihood, and the coping mechanisms and adaptation strategies that people follow to deal with climate change impacts. The report also inquires if migration is used by people in the CHT and plain land Chittagong as an adaptation tool, or if migration has the potential to be used as one of the tools in future. Finally the study reviews climate change, migration, and disaster and development policies in Bangladesh. It examines how climatic and environmental hazards of CHT and livelihood migration have been dealt in those policy instruments. The aim is to locate the policy gaps based on the field realities of CHT region and recommend measures to ease the hurdles of those who choose to migrate for additional livelihood.

Structure of the Paper

The paper is divided into five chapters. The first chapter presents the conceptual and methodological framework. It defines the terms which the study has used, the theoretical framework that it followed in understanding environment and migration linkage. It also presents research instruments, data source and methodology used by the study. This chapter finally reviews available literature on Chittagong Hill Tracts to understand to what extent the literature addressed the climatic and environmental hazards and livelihood migration issues. The second chapter introduces the study region. This includes location, ethnic composition, major climatic and environmental hazards, people's coping mechanisms and adaptation strategies, and the impacts of hazards on people's livelihoods, and the transformation that took place in livelihoods over a period of 20 years in these areas. Chapter three presents migration experience of the CHT people. It begins with exploration of socio demographic characteristics of those who migrated from the region and those who did not. It explores the role of climatic and environmental hazards in migration decision making process. Finally the chapter analyses the potential of labour migration as one of the adaptation tools in adaptation to climate and environmental changes. Chapter four assesses the existing climate change, migration and development policies of Bangladesh and locates the gaps in those instruments in addressing the issue of climate change and migration in CHT. Chapter five draws major conclusions along with a set of recommendations.

Chapter I
Conceptual and Methodological framework

This chapter begins with defining the key terms used in the study. Then it presents the analytical framework adopted by the study. It also discusses the research instruments, data sources, and methodology that are needed to operationalise the research.

1.1 Definition of terms

Hazards can be defined as a potentially damaging physical event, phenomenon or human activity which may cause the loss of life or injury, property damage, social and economic disruption or environmental degradation (UNISDR, 2004). This study refers to both to weather or climate related hazards such as change of precipitation or rainfall pattern, temperature rise cyclones, drought, flooding etc and environmental hazards such as landslides, deforestation, river bank erosion etc.

Vulnerability is linked to specific hazards or interactions thereof, and can be seen to have two basic elements: *exposure* and *susceptibility* to harm. Exposure is determined by where and how people live and work relative to a hazard. Susceptibility takes into account those social, economic, political, psychological and environmental variables that intervene in producing different impacts amongst people with similar levels of exposure (White et al., 2005)

Adaptation is defined as adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities (IPCC, 2001). There are different kinds of adaptation. This study focused on autonomous and planned adaptation.

Autonomous adaptation does not constitute a conscious response to climatic stimuli but is triggered by ecological changes in natural systems and by market or welfare changes in human systems. It is also referred to as spontaneous adaptation.

Planned adaptation is the result of a deliberate policy decision, based on an awareness that conditions have changed or are about to change and that action is required to return to, maintain, or achieve a desired state. These can either involve adaptation activities such as developing infrastructure or building the capacity to adapt in the broader user community and institutions, often by changing the decision-making environment under which management-level, autonomous adaptation activities occur (IPCC, 2007)

Capacity to cope – the ability to use available resources to meet basic needs at times.
Of adversity – affects capacity to recover thereafter, and subsequent levels of poverty and vulnerability. Coping strategies can be seen as short-run fall-back mechanisms whereby livelihood assets are called upon or 'cashed in' to enable households to respond to situations ranging from day-to-day challenges to extreme hazards or shocks, by reducing exposure or susceptibility and managing losses (White et al., 2005).

Coping and adaptation both are concerned with action taken by affected groups in response to hazard, but while coping capacities are attributes of livelihood or economic systems which enable losses to be absorbed, adaptation involves a permanent change in the systems themselves, usually driven by repeated exposure to hazard and/or to other longer term adverse trends which make those systems unviable, for example environmental degradation, climate change, socio-political tensions or poor governance.

Disaster risk results from a combination of *hazards* (potentially damaging events or processes) and people's *vulnerability* to those hazards. Both hazards and vulnerability are to varying extents products of development processes (UNISDR, 2004).

Disaster risk reduction: This Study describes policies and practices to minimize (with a view to longer-term prevention) disaster losses. These involve interventions in three broad areas: hazard minimization (where possible); reducing exposure and susceptibility; enhancing coping and adaptive capacity

Resilience is defined as the ability to absorb disturbance, undergo change, then self-organize, maintain the same basic framework and method of function and learn from and adapt to the disturbance (Dolan and Walker 2003).

Short-term contract international labour migrant is a person who is a member of the household and left for work to another country on a contractual basis for a stipulated period of time. This study has only considered those who have stayed overseas for more than a year (Siddiqui and Mahmood, 2014).

Internal labour migrant is a person who is a member of a household and left to work in another location within the country, and with duration of absence, or intended absence, of at least 3 months or has been continuously moving between origin and destination for at least a year. The definition of internal migration allows the study to include seasonal migrants (Siddiqui and Mahmood, 2014).

Cross-border and regional migrant workers are international migrants who are engaged, or have been engaged, in remunerative work in a country within their own region, but of which they are not citizens. When migrants work across the border of their country of origin, they are referred to as cross-border migrants. Regional migrants include those who have to cross more than one border within the region of their country of origin in order to reach their work destination (Siddiqui and Mahmood, 2014).

Migrants' remittance is that portion of migrants' income which they send usually to their country of origin. Remittance could be both in cash and kind. Internal migrants' remittance is that portion of their earning which they send home, usually to their family (Siddiqui and Mahmood, 2014).

Households are a domestic unit consisting of the members of a family who live together and eat their food from same cooking**.** If a family member is residing outside the family for a period of more than 6 months but he/she is counted in migrant households if they are sending regular remittance or if his/her family resides with the household. This study also covered the non migrant HH which do not have any migrant member (Siddiqui and Mahmood, 2014).

1.2 Conceptual Framework: Environmental Change and Migration link

This study used the Foresight (2012) conceptual framework to understand the linkage between environmental change and migration. According to the framework migration is a highly complex phenomenon. It listed five macro factors such as environment, social, economic, demographic and political that influence migration outcomes.

Economic drivers include scope or lack of employment opportunities in origin and destination areas or, countries. Demographic drivers include the size and structure of populations in origin areas, together with the prevalence of diseases that affect morbidity and mortality. Social drivers include familial or cultural expectations, the search for educational opportunities and cultural practices such as, marriage. The environmental drivers of migration include exposure to hazard and availability of ecosystem services. Political drivers cover conflict, security, discrimination persecution, and public or corporate policy. The framework highlights that environmental change influences migration outcomes through affecting existing drivers of migration. Economic drivers continue to be the most powerful in most situations. However, environmental change affects economic and other drivers.

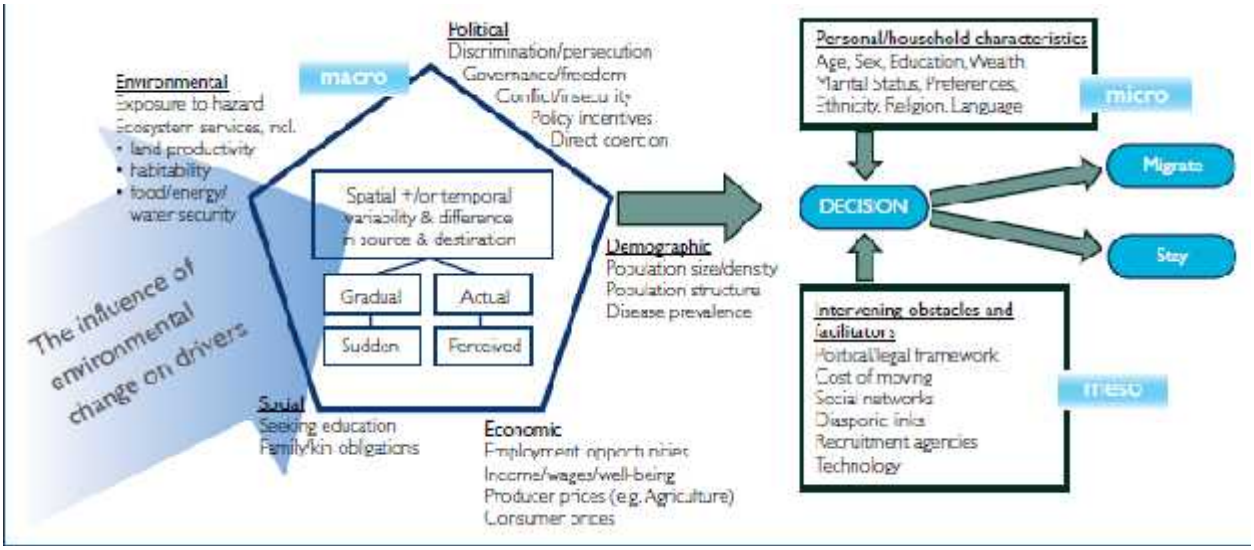

Figure 1: Environment and migration linkage (Source: Foresight, 2012)

An important feature of the framework is that the existence of migration drivers does not necessarily imply that migration will occur: whether migration will occur or not will depend on a series of intervening factors and personal and household characteristics. Intervening factors are located at the meso level that include cost of moving, social networks, presence of recruitment agencies, access to technology and political/legal framework. On the other hand personal/household characteristics include age sex, education, wealth, marital status, preferences, ethnicities, religion and language. It is important to understand migration in the context of environmental change. A combination of substantial social, economic and human capital may be required to enable people to migrate, particularly with regard to short term contract international migration. This may mean that environmental change may affect a driver, for example rain fed agricultural productivity through the reduced or erratic rainfall, however, the affected households/individuals might not have the financial capacity to respond to this change by migrating. Environmental change may also lead to deplete important assets, which can make migration less likely in some situations. It may have important implications for poorer individuals/ households who are unable to finance migration, but are also vulnerable to environmental change. By using this framework this study will try to locate under what circumstances environmental factors would influence migration decision of a HH and under what conditions it would not.

1.3 Literature review

Recent literature (Huda 2013; Irfanullah and Motaleb 2011; Gunter and Rahman 2008) on CHT Identified that climate has been changing in CHT. These studies identified the major climatic and environmental hazards in CHT that were high temperatures, drought, torrential rainfall, flash flooding, hail storms, pest attacks on people and crops (insects and vermin), disease of livestock, weed infestation in jhum fields, and earthquakes. Irfanullah and Motaleb (2011) found that high temperature heightened drought situation that reduced the supply of water for irrigation, causing subsequent crop damage. It also found that high temperature increased the occurrence of diseases like diarrhoea and malaria, leading to increased medical expenses. Gunter and Rahman (2008) projected that the entire CHT region is expected to experience moderate droughts during the Rabi and pre-Kharif seasons (November to February) by 2030. Irfanullah and Motaleb (2011) also found medium intensity floods with flash floods on a cycle of 4-5 years particularly in Bandarban district. It also stated that increased and erratic rainfall increased flooding and landslides that made damage to arable land due to mud deposition, nd

reduction of fish stocks in ponds. Some of these studies (Huda 2013; Irfanullah and Motaleb 2011) identified the major climatic hazards and their impacts particularly on crops production but did not highlight how it impacted the whole livelihood system in the CHT. They did not mention how people coped and adapted with the changes of climate and environment. The studies also did not cite if livelihood migration has been taking from these places. They also lack policy directions to effectively deal with the challenges of climatic and environmental hazards.

In the last 15 years, a couple of baseline surveys were also conducted in the CHT based on primary large data set. The notable studies were HRDC led socio-economic survey and BCAS led scientific study on natural resources. The HRDC (2009) baseline study which surveyed 3238 households in 199 villages included demography and its evolution, village profile, socio-economic condition of all the ethnic groups including education, livelihood, poverty rate, land ownership possession and dispossession, household assets, health care access, water and sanitation. It also included women empowerment issue and the institutional function status of both government and private organization. However, though the study tried to incorporate all the socio-economic features of CHT, however, it did not include hazards associated with climate and environmental change in CHT including people's adaptation to the hazards. The study included a chapter on migration that focused on transmigration of Bengali speaking people in to CHT, displacement and migration scenario among Indigenous population. The migration scenario only discussed the extent of migration that took place before 1997 accord. It showed that about 13% of all CHT rural households had at least one of their members were migrant before signing of peace accord in 1997. Across the communities about 41% Chakma households were in the same position, followed by the Bawms (18%). Tripura (8%) and Tanchngyas (7%) and Bangalee households (5%). Enquiry into the causes reveals that about 10% migrated due to reasons related to security concern, and communal or political conflict. Among the indigenous population, the same was reported by about 15% of all households, while it was reported by only 5% of all Bangalee households. Across the indigenous population, a similar concern was stated as the reason for out-migration by one in three Chakma households (33%). The study termed that security and related issues were the most crucial consideration of those who had to move out of home for shelter during 1976-1997 However, the study It lacks information and discussion on the livelihood migration scenario that has been taking place especially after the 1997 peace accord.

BCAS in partnership with UNDP conducted a scientific study between the years of 2005-2006. The study (2007) included eight volumes of papers on the bio-physical characteristics of CHT, mapping of natural resources including land, water, forests, and major environmental stresses such as deforestation, landslides, land degradation, and soil erosion. The study also included climate change scenario of CHT particularly the change in rainfall pattern that became erratic or irregular. It projected that the region is expected to receive heavy rainfall in short duration that is likely to damage the soft top soil. It will lead to increased soil erosion and landslide events in the region. The study also assessed how erratic rainfall can affect the water and forest resources. However, it did not attempt to measure how changed rainfall pattern can affect people's livelihood in this region. There was no discussion on migration as a livelihood option. The policy recommendation of the study targeted to improve the natural resource management in CHT. Apart from these studies, recently Rasul (2015) conducted a study on developing a framework for sustainable development in the CHT. The study identified an array of challenges e.g high poverty, low human development, non income poverty, rapid population growth, poor market access, high dependency on agriculture, limited off farm employment opportunities etc that inhibit development in CHT. Given the current realities of environmental change as well as increased connectedness of CHT local economy with national and regional economies the study recommended to adopt an integrated strategy to develop both farm and nonfarm sectors for steering economic growth in CHT.

Some recent literature (Martin et al., 2014; Siddiqui and Billah, 2014) established important links between climate and environmental hazards and migration in Bangladesh. These studies focused on the cyclone prone coastal areas in south; and flood and drought affected areas in the northern region of Bangladesh. Though these studies did not consider CHT as their focus however, they provide substantial primary knowledge on how migration decision making processes at household level was shaped in the face of climate extreme events. Martin et al., (2014) study found it difficult to distinguish between the roles of climate change vis-à-vis other social, economic and political factors in driving migration. The difficulty arises as migration decision making involves a reasoned response embedded in livelihood patterns, cultural expectations, gender, historical contexts, values and Individual choices in the migrants' life course. Moreover, difference in age, stages in the migrant's life course, and human capital including social networks as well as the demand side of the labour market determine who migrate and who does not. Siddiqui and Billah (2014) collected qualitative evidences of migration in Bangladesh associated with climatic and environmental hazards such as rise of

temperature, irregular rainfall, cyclone, drought, flood, riverbank erosion and salinity. The study found that in the face of climate extreme events a section of HHs particularly whose livelihoods were affected by extreme events used livelihood migration as an adaptation tool that enabled their respective households to adjust with the climate change impacts in their origin locations. Migration provided vital income, knowledge and network for respective HHs. Migrant network was often used by fellow villagers to facilitate their migration and secure job and accommodation in the destination areas. The pattern of migration was found largely temporary and seasonal in nature. The major destinations were mainly in the capital city Dhaka and other metropolitan cities such as Chittagong, Sylhet, Rajshahi, and Khulna.

1.4 Research Instruments

This study uses three types of research instruments based on the need of the research. These are: I) Literature review II) Key Informants Interviews (KIIs) and III) Household Survey

Literature review: The aim of the literature review is to gain from existing knowledge and to identify the research gaps**.** The study will review two kinds of literature. One is on region specific which include the Chittagong Hill Tracts region and the other is broader literature on CC and migration. The region specific literature will include existing available literature on the biophysical, population characteristics of Chittagong Hill Tracts region; the major environment and climate change hazards that the region has been facing; and the socio-economic, cultural and political realities in the region. The broader literature will include available studies on the environment and migration linkage; impact of migration on poverty, community and local development, and the migration as an adaptation option in the context of climate change impacts. It will also include review of existing policies, strategies, and action plans of Bangladesh government related to climate change, migration, disaster, and development to understand if these instruments featured the hazards of CHT and took into cognizance migration as an adaptation option to climatic and environmental hazards.

Key Informant Interviews: This study uses two groups of KIIs. The first group of KIIs will include important stakeholders such as research/think tanks, government agency and local level NGOs. They will provide overall socio-political, economic, cultural and environmental realities about the field sites. The second group of KIIs will be key individuals at the village level who will have in depth knowledge about their respective villages. They will include *Carbari, (headman* of

villages), school teacher, local journalist, NGO activist, Union Parishad Members and Chairmans, and others. KIIs will be used to capture the village and community level characteristics and will be administered with a structured and open ended questionnaire. The information collected from KIIs will include biophysical and population characteristics of villages including their livelihoods and the transformation of livelihoods that took place in the last 15 years, major environment and climatic hazards that each village has been facing for a period of 15 years; impact of those hazards on livelihoods, People's coping and adaptation strategies to hazards and the overall migration scenario in respective villages. Information will also include on land ownership pattern, wage rate, market places in the vicinity, social institutions, local infrastructure, health care facilities and educational opportunities in the villages.

Household Survey: Household survey based on detailed questionnaire will be used in this study. Two different sets of questionnaire will be developed, one each for migrant and non migrant households. The questionnaire will be organized in seven broad heads. These are i) contact information ii) household grid iii) information on current and return migrants, their migration histories, drivers and cost of migration, remittance pattern, skills enhancement etc. iv) expenditure pattern and assets of migrant and non migrant households v) investment and savings and vi) social and community impacts.

1.5 Data Source

The empirical base of the study comes from Key Informant Interviews (KIIs) and a detailed household survey carried out in three administrative districts of Bangladesh. The selection of districts was both random and purposive. Out of three districts in the CHT two districts e.g. Rangamati and Khagrachari were chosen randomly since there was dearth of knowledge on impacts of hazards on livelihoods and migration pattern and behavior of people. Conversely, the one plain land district Chittagong was purposively selected. The purpose of selecting a plain land district is to provide a comparative discussion related to the CHT region. The criteria of choosing plain land district was i) Close vicinity to CHT region ii) Exposure to environment and climatic hazards ii) having high intensity of internal migration (lM) and international migration. Through Lottery Rangamati and Khagrachori were selected and Chittagong district was selected purposively. Chittagong district is very close to CHT (only a few Km away). Through literature review the study found that the plain land Chittagong district has been undergoing through

environmental change and at the same time it is the second highest short term contract international migration (STIM) producing district in Bangladesh.

In Rangamati and Khagrachori, upazilas and villages were chosen from the data that were found from the literature review on CHT, and consultations with stakeholders' e.g Bangladesh Centre for Advanced Studies (BCAS), Ministry of Chittagong Hill Tracts Affairs and local level NGOs such as Zabarang in Khagrachari and Green Hill in Rangamati. The criteria for choosing Upazilas and villages were i) Presence of ethnic groups e.g Chakma, Marma, Tripura etc ii) Exposure to environment and climatic hazards e.g reduced rainfall, extreme heat, reduced water flows in the mountain streamlets, deforestation, landslides etc. BCAS did quite a few scientific studies in the CHT on environmental degradation in the last 10 years. MOCHT is the line agency that has been monitoring development projects and local governance for almost a one and half decade in CHT. MOCHT and BCAS suggested about the Upazilas and some of the villages that can be considered for field work which were also validated by literature review. BCAS also helped RMMRU connect with and build partnerships with local NGOs such as Zabarang and Green Hill in CHT. The final selection of the villages took place through a brain storming workshop where partner NGOs played a key role in coming up with the list of potential villages in four Upazilas in Rangamati and Khagrachari districts in CHT based on their prior works in implementing development projects in some of these villages. The purposively selected Upazilas were Panchari and Khagrachari Sadar in Khagrachari district and Kaptai ad Rangamati Sadar in Rangamati district. A total number of 22 villages were selected from these four Upazilas.

In plain land Chittagong district, On the other hand, the two Upazilas such as Satkania and Hathazari were selected based on the information available on similar exposure to climatic and environmental hazards and the high Internal migration and STIM intensity from these Upazilas. It is noted that Hathazari and Satkania are the top five STIM producing upazilas in Chittagong district. The five villages were selected from these two Upazilas randomly.

A total number of 27 KIIs were conducted with each village have one KII. With regard to HH survey, the target was to conduct a total number of 330 household level surveys in three districts of CHT and Plain land Chittagong. Each district comprised of 110 households with each Upazila consists of 55 surveys.

A total of 344 interviews were conducted in HH survey. 109 of them were conducted in Khagrachari district, 125 in Rangamati and 110 in Chittagong. The migrant HH consists of 177 interviews whereas 167 Non-migrant households' interviews were conducted in these three districts. Among migrant HH the number of male HH was 151 and female HH was 26. Migrant households consist of Internal migrant HH (114) and STIM HH (63) of both male and female migrant households. Among Internal migrant HH the number of male and female HH were 93 and 21 respectively where as among STIM the number of male and female HH were 58 and 5 respectively.

Table 1.5.1: Total number of migrant and non migrant households

Type	Rangamati	Khagrachari	Chittagong	Total
Migrant	55	53	69	177
Non-Migrant	70	56	41	167
Grand total	125	109	110	344

Table 1.5.2: District wise distribution of male and female migrant including type of Migration

District	Internal			International			Total MHH
	Male	Female	Total	Male	Female	Total	
Rangamati	34	09	43	11	01	12	55
Khagracchari	42	10	52	01	00	01	53
Chittagong	17	02	19	46	04	50	69
Total Male and female migrant HH	93	21	114	58	05	63	177

RMMRU developed a partnership with Department of International Relations, University of Chittagong for conducting the field work. Enumerators were selected through a competitive process based on their knowledge on climate change, adaptation, migration and the inter-personal communication ability to conduct field work. Priorities were given to students who belong to Indigenous groups in CHT and Chittagong district who are familiar with local language and culture. Two faculty members were selected based on their interest and knowledge on the subject matter. They supervised the field work including data collection, cleaning, and transcription of KIIs. Both enumerators and co-researchers from Chittagong University received two day intensive training on theoretical issues e.g climate change, adaptation and migration; proposed methodology of the research; field work strategy, design; questionnaire operationalisation and ethics of conducting interviews.

1.6 Research Methodology

The village heads known as Carbari were identified in each village through the help of NGO's. The key informant interviewees identified the migrant HH in each village. From that identification list a stratified sample technique was used to separate the male and female migrant HH. On the other hand, the non migrant HH were selected based on the information gathered from migrant HH. The research team asked migrant HH about 'which non migrant HH had similar socio-economic situation in their villages before migration their HH.' Those non migrant HH were thus reached following the snow ball technique.

Two separate questionnaires were prepared: one each for migrant and non-migrant HH. Absence of any information relating to migration and remittances was the only difference between the two sets of questionnaires. A sample set of questionnaires is listed in the appendix.

Transcript was prepared for analysis of qualitative data. The data of HH survey has been processed on computer using the SPSS programme. Once the data were entered into computer it was cross checked, edited and pre-tested for any inconsistencies. Statistical tools used to analyse data included descriptive, frequencies, cross-tabulation and reports. Data analysis was preceded by preparation of a detailed set of dummy tables covering all different issues of survey interests.

The policy analysis included the review of national adaptation programme of action (2005), Bangladesh climate change strategies and action plans (2009), disaster risk reduction and management policies (2003-09), Bangladesh overseas employment policy (2013) and National sixth five year development plan (2011-2015). It also assessed the last 20 years' and current development projects undertaken by the Ministry of Chittagong Hill Tracts Affairs (MOCHTA), Government of Bangladesh and Chittagong Hill Tracts Development Board (CHTDB).

1.7 Chapter conclusion

Based on review of literature, this chapter identified major climatic and environmental hazards of CHT. These are torrential rainfall, rise of temperature, deforestation, flash flood, and drought. Hardly any study was found which highlighted the impact of climatic and environmental hazards on the livelihoods of locals. Neither there existd any research that recorded recent livelihood migration trends from CHT. Given the paucity of information these study developed a conceptual framework to understand the link between climate change and migration in the context of CHT based on the foresight report on drivers of migration. This chapter also designs the methodology of the research. Literature review, key informant interview, household survey were chosen as research instruments.

Chapter II
Climatic and Environmental Hazards and Transformation of Livelihood In CHT and plain land

This chapter introduces the study locations, their population and ethnic composition. It then presents the major climatic stresses of the areas. One of the impacts of climatic and environmental hazards was loss of traditional livelihood. The chapter therefore, concentrates on tracking the transformation of livelihood of the people in these areas. It also explores to what extent migration has taken over the new livelihoods.

2.1 Location

The Location of the study includes two districts from Chittagong Hill Tracts region and one plain land district Chittagong. The Chittagong Hill Tracts (CHT) is situated in the southeastern corner of Bangladesh and is covered with lush green hills, innumerable *jharnas* (scattered springs) and hundreds of *choras* (mountain streamlets). The territorial boundary of the region is: (a) in the east, the Arakan (Southern Chin State) of Myanmar and Mizoram state of India, (b) in the north, by Tripura state of India, (c) in the west, by Chittagong District, and (d) the south, by the Cox's Bazar district. The CHT region is as high as over 4000 feet in places, the hill ranges containing limited cultivable lands that distinctly vary from the fertile multi-yield fertile alluvial plains of the rest of Bangladesh. The region is situated between 21025! and 23045! north latitudes and

between 91045! and 92050! east longitudes. It has a total land area of about 13,294 square km (about 10% of land area in Bangladesh). Administratively, CHT comprises of three hill districts: Banadarban (4479 sq. km.),Khagrachari (2699 sq. km.), and Rangamati (6116 sq. km.). This study covered Khagrachari, and Rangamati district from CHT.

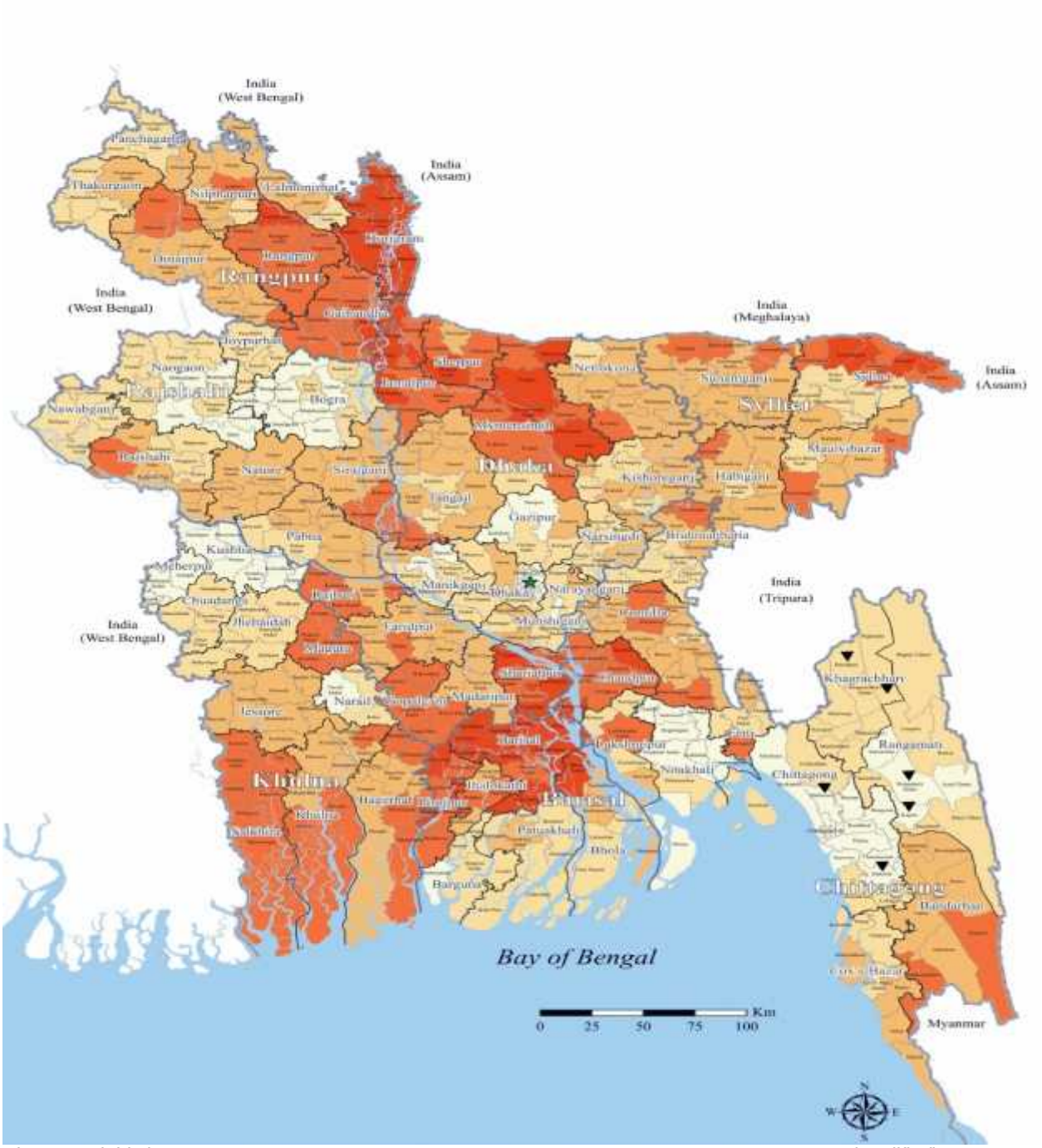

Figure 2: Field sites *Source: Poverty Map, BBS-2014(modified)*

Khagrachari is a valley. It has three rivers namely Chengi, Kasalong and Maini. Chengi is the longest river in Khagrachari. Most of the lands of Khagrachari are hilly areas. It has 8 upazilas, 34 unions, 120 *mouzas* and 1581 *paras*. This research studied Khagrachari Sadar and Panchari Upazila. Khagrachhari Sadar Upazila has an area of 7,3617 acre land. It has total household of 2,4316 and population 111,833. The population density is 375/Sqkm. On the other

hand, Panchhari Upazila has 8,2560 acre land. It has 1,4154 households and total population 62,198. The population density is 186/Sqkm (Population Census, 2011). This research studied 7 villages (*Para*) from Panchari and 5 villages from Khagrachari Sadar upazilas.

Rangamati, Known as lake-city, located on the western bank of Kaptai lake. It has 10 upazilas, 48 unions, 162 *mouzas* and 1344 *paras*. This research covered Rangamati Sadar and Kaptai Upazila. Rangamati Sadar Upazil has total land of 135,040 acre. It has 26,872 household and 124,728 population. The density of population is 228/SqKm. On the other hand, Kaptai Upazila is constituted of 64,000 acre land along with 13,515 households with a total population of 59,693. Population density in Kaptai is 230/sqkm (Population Census, 2011). This research covered 5 villages (Para) from Rangamati Sadar and 5 villages from Kaptai Upazila.

The plain land Chittagong district also called the commercial capital of Bangladesh with an area of 5282.98 Sqkm, is bounded by Feni district and Ttripura (Indian state) on the north, Cox's Bazar district on the south, CHT districts on the east and Noakhali district and the bay of bengal on the west. Chittagong district has hills, rivers, sea, forests and valleys. The main rivers are karnafuli, halda and Sangu. The district consists of one city Corporation, seven municipalities, six thanas, 20 upazilas, 197 union parishads and 1,319 villages. This study covered two upazilas e.g. Satkania and Hathazari.

Hathazari upazila is located on the bank of river Halda. It has total land area of 60,867 acre. The number of household is 81,292 along with 431,748 Population. The density of population is 1753/Sqkm. The upazila consists of 16 union parishads, 47 mouzas and 56 villages. This research studied 3 villages from this upazila. On the other hand, Satkania upazila stands by the river Sangu. It has total land area of 69,431 km with 70,808 households and 384,806 population. The density of population is 1370/SqKm. It consists of 17 union parishads, 71 mouzas and 100 villages. This research studied 2 villages from this Upazila.

2.2 Ethnic composition

CHT is currently the home of twelve ethnicities that include 11 indigenous groups and Bengalees. Indigenous groups are Bawn/Bawm, Chak, Chakma, Khyang, Khumi, Lushei/Lushai, Marma (Maghs), Mrus/Mro (Moorangs), Pangkhua/Pankhua, Tangchangya, and Tipperas (Tipras). According to information collected from Key Informant Interviewees (KIIs), the

12 villages that this study covered in Khagrachari district found about 795 households that include almost 3,212 people. The average household size was around 4.0. The highest number of population (480) and household (120) was found in *Dakkhin Ultachori* village in Panchari Upazila which was a Chakma village. Conversely, the village called *5 No Ultachori* in Panchari Upazila constituted the lowest number of population (120) and households (27) which was also a Chakma village.

In Rangamati, the 10 villages, where the study was conducted, comprised of approximately 1,126 households which accommodated around 5,050 people. The average household size was nearly 4.50. *Kaindadosori Para* village in Rangamti Sadar upazila was found the biggest in terms of population (1200) and household (315). Chakma and Tangchangya live in this village. Tripura Sori which is Tangchangya village was the lowest consisted of 32 households and 180 people.

The plain land Chittagong district included five villages in Satkania and Hathazari upazila which have around 460 households and 2,074 populations. The average household size was found nearly 4.5. The largest village was found in *Satkania Upazila* called *Uttor Brahman Danga Notun Para* which had around 630 people in 147 households. On the contrary, Anaullah ukiler para in *Hatazari upazila* was found the lowest in terms of population (310) and households (67).

The analysis of ethnic composition shows that the CHT is a heterogeneous region that includes diverse ethnic groups and plain land Chittagong district is homogenous where only Bengali speaking people live. The differences among these districts in number of population, and household are very minimal. Rangamati and plain land Chittagong share the same family size (4.5) which outweigh Khagrachari district by .50.

2.3 International labour migration from the selected districts

International labour migration plays a significant role in the national development of Bangladesh. It is the highest net foreign exchange earning sector of the country. In 2014 Bangladesh received USD 13.83 billion as remittance which was equivalent to 11 **%** of Country's GDP. A recent RMMRU-SDC study (2014) found that International migration has an important poverty reducing effect. It found that only 13% of international migrant households are living under the poverty line whereas 26% of the total population of Bangladesh lives under the poverty line.

The Government of Bangladesh has also been incorporating migration into different development strategies. It is important to know the level of participation of people of hill districts in international migration. Since 1976 to 2014 a total number of 9.17 million people migrated overseas as short term contract worker (BMET, 2015). However, bulk of migration has been taking place from the eight districts which account almost 47% of total migration flow (RMMRU: 2014). One of our study areas, **Chittagong** is one of the high international migration districts. Chittagong accounted for 9.97 percent of total migration flow from Banglabesh since 2005 to 2014. Hardly any migration takes place from **Rangamati** and **Khagrachari**. Only 0.05% of the total flow is from Rangamati and 0.09% from Khagrachori.

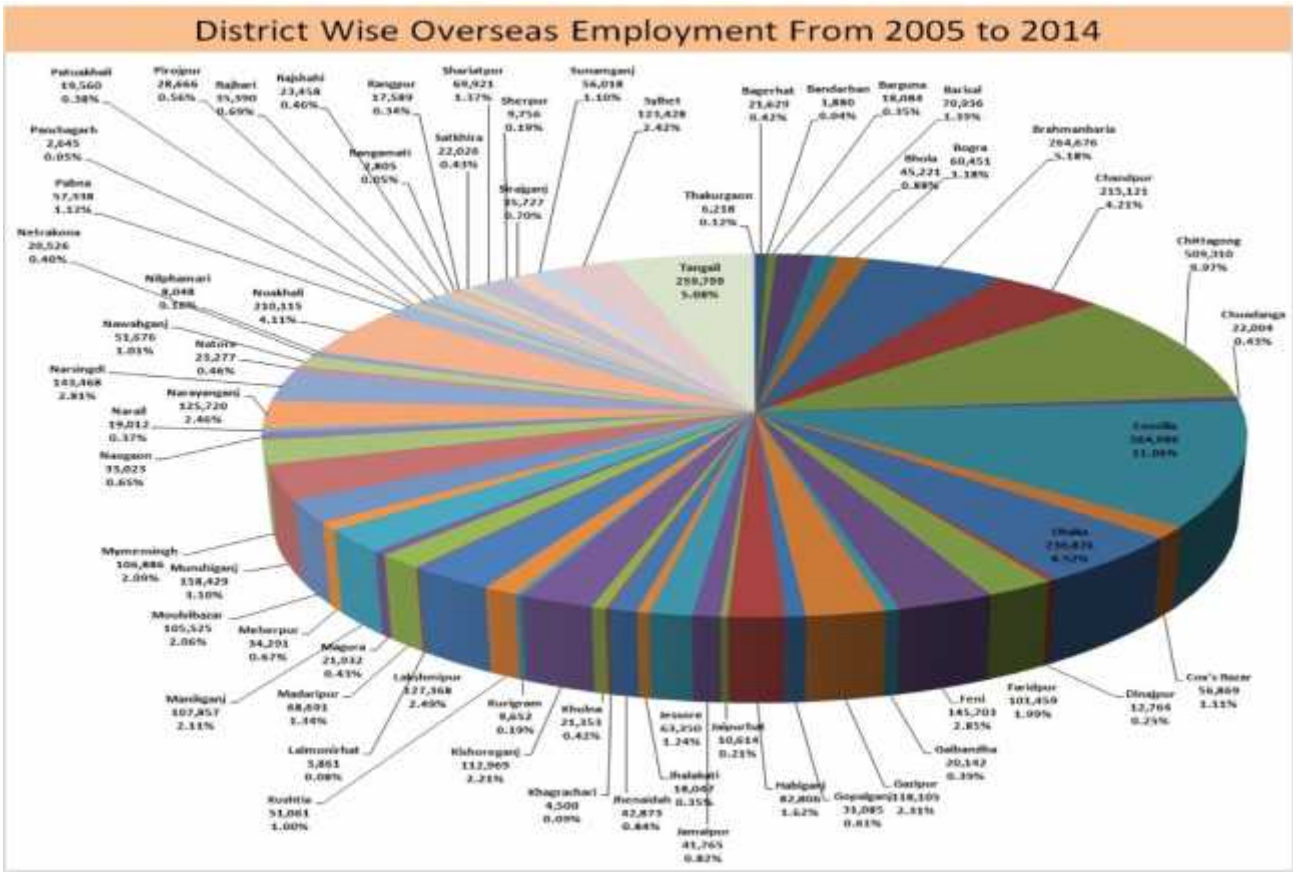

Figure 3: District Wise Overseas Employment 2005-2014 (*Source: BMET database (2015))*

Besides, International migration contributed to increase the daily wage of labour in the major source districts.

2.4 Internal Migration from Selected Districts:

Internal Migration has significantly been increased over the years in Bangladesh. The BBS 'sample vital registration system (2000)' suggests that the proportion of lifetime internal migrants doubled (from 3.4 percent to 7.4 percent) between 1974 and 1982 and reached 10.2 percent in 1991. The same statistics showed that 46% of this total migration occurred from rural to rural areas in the 1990s. The net migration[1] increased dramatically from 1.2 percent to 16.4 percent in urban areas between 1984 and 1998. The rural areas also experienced the increase of net migration from 1.5 percent to 4 percent during the same period (BBS: 2000). The comparative analysis of BBS Gender statistics data (2009) suggested that the rural in migration increased 7.1 percent (from 13 percent to 21.1 percent) between the 2002 and 2007.

The primary geographical origins of migrants are the central parts of Bangladesh, with more than 90 percent of poor migrants coming from the districts of Barisal, Comilla, Dhaka, and Faridpur (Afsar: 2002). Those districts are generally not the most impoverished in terms of agricultural productivity; but they have land-scarcity and are flood-prone. The regions also have fairly easy access to destination cities (Afsar: 2002; Islam: 2003). Seasonal Migrants are mainly originated from North-West region of Bangladesh i.e. Rangpur, Gaibandha, Nilphamari, and Kurigram moslty during lean harvest or *Monga* period (Afsar: 2005). A large number of temporary migration also takes place from Mymensingh, Jamalpur, Netrokona and the vulnerable river bank erosion areas, i.e. Sirajgonj and Pabna (Abrar and Azad: 2003). In recent times, the coastal areas of Bangladesh, i.e. Satkhira, Barguna, Khulna, Pathuakhali, Bhola have also experienced a significant number of people's outflow from their places of origin due to frequent visits of cyclones with tidal waves. Migration from coastal districts takes the form of intra district, inter-districts and interdivisional depending on the availability of jobs, and social network of migrants. Several studies found that Dhaka, the capital city is the most attractive location for all types of migrants (Hussain: 1996, Afsar: 2001). The industrial zones in Gazipur, Narayanganj districts and the metropolitan cities, i.e Chittagong, Sylhet are also pulling a large number of migrants (Afsar:2005).

However, very few knowledge on migration were found in the context of Chittagong hill tracts. As mentioned in the literature review section, a large scale migration took place in CHT before signing the peace accord in 1997 and the reason was mainly security, conflict and government

[1] Net Migration rate (/000 population) was calculated by deducting emigration from immigration.

policy particularly Bengali resettlement to match the demographic balance against overwhelming majority of non Bengali ethnic groups in CHT.

2.5 Climatic and environmental hazards in CHT and plain land Chittagong

The village level information gathered from Key Informants Interviewees suggest that a significant change took place over the last 15 years in temperature and rainfall both in CHT and plain land Chittagong district.

In Khagrachari, all the 12 villages experienced temperature rise. As an inhabitant from the village of *Dakkhin Shantiput* the headman (male), 50 years old says: ‘’We have been feeling extreme hot for the last 5-7 years. This year (2014) seems to be the hottest in the last 10 years’’. Most of the the villages witnessed erratic or irregular rainfall that featured lack of rainfall in time or season. They found seasonal variation inconsistent throughout the year. A female primary school teacher, 35 years old in the *Kangu Para* village says ‘’ We knew that Bangladesh is a country of six seasons. Now we can only feel two seasons e.g summer and winter’’ and the changes I guess took place in the last 10 years.’’ A few of the villages experienced decreased rainfall over the last 15 years though with an increase of heavy rainfall in short duration. The irregular and decreased rainfall pattern led to the increased dry up of mountain streamlets in most of the villages, which was the principal source of water in all the villages in Khagrachari. In these villages, water flow in mountain streamlets reduced substantially round the year with severe crisis of water particularly in summer and winter. A respected male elderly from the Marma community, 75 years old in *Koi Chakri Para* (village) says: ‘’Choras kept us alive in the hills in the past. Now Choras are drying out and we are also dying back’’

The dry out of mountain streamlets associated with erratic rainfall also increased drought situation in many villages. The drought situation in these villages was unique in this sense that villagers identified lack or decreased supply of water as drought situation. It was spotted markedly in one village that where 10-15 years before people could get water in their wells by digging surface 10 fit down; at present they do not get water at that level. The water level went down 40 feet. Even not all the places were suitable for digging wells. They needed to dig wells quite frequently now a days as the older ones dry out in very short time. The banks of wells were found fragile because of soil liquefaction. Apart from climatic hazards, it was found that 10 out of 12 villages have been going through massive deforestation processes. . Over the years,

these villages also went through demographic change in terms of population rise and many villages experienced expansion of *Jhum* cultivation that contributed to deforestation. One male Jhum cultivator of 60 years old in *Haping Para* village says: ‘‘My family is now big! 10 years before, we were only five. Now my son has a family of wife and a daughter and they live with me .and we are currently eight. I took an extra 50 decimal land in lease two years before from my relative for Jhum cultivation. We cleared the trees and burnt them...to make the land suitable for Jhum.’’ A very few of the villages were found exposed to river bank erosion and flash flood. Villagers identified the loss of depth of river due to sedimentation along with heavy rainfall in short time as the s perpetrators of erosion and flash flood.

Likewise Khagrachari, all the 10 villages of Rangamati experienced high temperature in the last 15 years. KIIs informed that temperature rose almost 5-7 degrees in these years. The last five years were very hot particularly summer time temperature increased. As one women of 40 years old from *Tripura Sori* village says ‘’ It is very hot now a days. I cannot assist my husband’s work in Jhum land that much longer and get tired in short time.’’ All the villages faced irregular or erratic rainfall. Rain became very much unpredictable particularly in the months of Chaitra (March-April) and Kartik (October-November). Though a few of villages had decrease rainfall but heavy rainfall in short duration increased in these villages. ‘‘Earlier times during rainy season we could not go outside of home because of constant rain, and sometimes rain continued to pour 2-3 days at a stretch. At present, rain reduced much. We get more thunderstorms now.’ says a male farmer, 50 years old in the *Shilchoripara* village .’’ The erratic rainfall directly contributed to the reduction of water flow round the year in most of the villages and a section of these villages had seasonal water reduction particularly in summer (*Chaitra*) and winter. The irregular rainfall was manifested mostly by the increased drought situation in all the villages. People did not get rain during October-January that causes scarcity of water in most of the villages. In one village drought was found prevalent at least for six months in a year. Moreover, some of the villages which stood by the Kaptai lake experienced flash flood caused by heavy rainfall in short duration. Apart from climatic hazards, environmental hazards such as deforestation was found a common and pervasive problem in the villages of Rangamati. Almost in all the villages extensive deforestation processes were found caused presumably by population growth in the last 15 years. The extension of Jhum cultivation also led to the clearances of forests in several villages. Some of the KIIs informed that the widespread reduction of forest also affected the water retention capacity of soil and thus reduced water flow in mountain streamlets. Deforestation was also found a major driver of soil erosion that led to

major landslide events in recent years. A male headman, 43 years old from the *Khuramara* village says '' Living in the mountains are becoming difficult and risky day by day. Last year a landslide event wrecked a couple of houses though household members could narrowly escape themselves from injuries and death.''

In plain land Chittagong district, all the surveyed three villages in Satkania upazila experienced temperature rise and rainfall change particularly heavy rainfall in short duration. However, their main problem was river bank erosion which was mostly the result of inadequate river management. For example, when the *Sangho* river started eroding 20 years back, the one side of the river which was close to Chandonaish upazila was well taken care off. Strong concrete protection was installed to protect the upazila whereas the other side of the river which was close to Satkania upazila remained unprotected. As a result the Satkania upazila side of the river eroded several times that almost gobbled two-thirds of these three villages over the years. A male farmer of 60 years old says in the *Choroti* village'' Once river gave us every means for living now it is taking all from us, our lands, houses, schools and our markets.'' The river erosion led to the displacement of people from the one side of the rivers to the other sides. People mainly moved to the adjacent char lands.

On the other hand, the KIIs of the two villages in Hathazari upazila mentioned about temperature rise and decrease of rainfall particularly in monsoon season. Two villages of Satkania upazila also vulnerable to increased river bank erosion. According to the Key informants, increase riverbank erosion, at least to some extent, was a result of unplanned river management. The erosion started 10 years before when a donor funded project constructed concrete bank on the other side of the river close to Raozan Upazila. It led to change the course of river current and made Hathazari Upazila vulnerable to erosion since it lacked protection. Along with this, these two villages also regularly experienced flooding resulted from the intrusion of high tide water. The villages are mainly located in downstream areas. Two sluice gates were built in the upper streams to provide water to Fatikchari upazila. The river lost its depth in the downstream and during monsoon it floods the adjacent villages.

The findings from the CHT and plain land Chittagong show that both areas face climate related hazards, such as high temperature and irregular rainfall; however their impacts on key systems are different. In CHT, erratic rainfall led to reduction of the flow of main water source such as mountain streamlets (Chora) both seasonally and round the year which created water scarcity

and drought situation. CHT villages also experienced massive deforestation over the years due to high population growth and the expansion of shifting cultivation in new lands. A few villages in CHT particularly from Rangamati witnessed flooding resulted from primarily heavy rain in short duration. On the other hand, the villages in plain land Chittagong though faced high temperature and erratic and heavy rainfall; however their main hazard was river bank erosion, which was mostly linked to the unplanned and poor river management system. Apart from this, the villages located in the downstream face regular flooding caused by the incursion of high tide water. In both CHT and plain land Chittagong the findings of the study showed no disagreement in perception of men and women with regard to changing climatic condition i.e increased temperature and irregular rainfall. However, adaptation mechanisms of men and women vary that will be demonstrated in the following section.

2.6 Adaptation to climatic and environmental hazards

People in both CHT and plain land adopted different sets of coping and adaptation strategies to deal with the climatic and environmental hazards in their respective villages. In Khagrachari, in the past during hot summer days villagers used handmade fans or take shelter under tree shades to cope with hot temperature. Now some of them are using electric fan with power generated from solar system to adapt with the increased temperature. The Solar power provided by some NGOs in the area (Grameen Shakti). Earlier, their houses did not have ventilation system, but now they have adopted some autonomous adaptation strategies such as putting some holes for allowing air and sunlight come and go to keep the inside temperature cool. Earlier they used to build their houses with bamboo now they are following a unique autonomous adaptation technique such as using tin shed and put another layer of bamboo led roof under the tin shed which absorbs extra hit the room. Temperature rise was faced by bringing in changes in attire of some of the ethnic groups. A male member of the Chakma, community, 55 years old in Bhajsotul village says: ''We cannot do jhum cultivation or plain land agriculture cultivation by wearing our traditional dresses- lungi and khami; because those are made of thick fibers instead we now wear linen shirt and pant''. To keep water cool, they have started using earthenware.

To live with irregular rainfall, most of the villagers espoused an autonomous adaptation technique in agriculture. They brought changes in the pattern of Jhum crops. Now they cultivate turmeric and tobacco in their jhum lands that required less water than other crops. Instead of

Jhum and collecting forest resources, women are largely involved now a days in homestead farming which is one of the responses to irregular rainfall and high temperature. A women of 46 years old dakkhin shantiput para states 'I plant some easy cultivable vegetables like amila, papaya, pumpkin, tomato, beans, and others. These crops grow easily with little water and are used to meet daily food requirements. I use, organic kitchen waste as fertilizer to grow them'.

In few villages, some planned adaptation efforts were also practiced to adapt with the water shortage associated primarily with changing rainfall pattern. For example in some villages communities built ring tube well with the support of donor agencies e.g UNDP. The depth of this type of tube well was on average 40 feet. However, most of the tube well could not produce water other than rainy season. In some villages, communities constructed water filters with the support of NGOs to reserve water but due to less rain, water could not be found round the year. Some of these planned adaptation efforts to deal with irregular rainfall could not produce desired outcome. They were not adequate to deal with the subsequent change that took place in the rainfall in CHT. This is linked with the assertion that when those technologies applied they lacked proper assessment of the future climate change projection that took place in the lateral period in the CHT.

In the villages of Rangamati, people are also using solar power generated fans to cope with high temperature. Farmers who do agriculture cultivation reduced their reliance over rain and now they use pump led irrigation for watering their crops. Lack of rain also made many people change their occupation from Jhum cultivation to fishing in the river and lake and plain land agriculture cultivation. In agriculture they use insecticides and pesticides to increase the productivity and protect production from loss that they did not use in Jhum cultivation. Some people also introduced fish farming in the *Ghona* by putting bar over the flow of mountain streamlets.

In plain land Chittagong, where river erosion was the main hazard, people mainly coped by moving from one erosion affected areas to nearby less or non erosion areas within village. A large section of people moved from the affected villages to other villages. Many of them lived in the government own *Khas and Char* lands or bought lands in their new destinations. Many households sent their at least one family member abroad and cities for diversify their household

income. Besides, people who used to do agriculture cultivation now they turned to fishermen, boat men etc.

2.7 Impact of climatic and environmental hazards on people's livelihoods

KIIs informed that climatic and environmental hazards substantially impacted people's livelihood in both CHT and plain land Chittagong district. It was found in many instances that over the last 15-20 years those hazards led to gradual transformation of livelihoods for both man and women in association with other social, economic, demographic and political factors. The men in the community are the main source of family income. They mainly do Jhum cultivation, work in the forest, and collect forest resources and sell them in local market. On the other hand, women are responsible for household work and are expected to ensure that the family's daily needs are satisfied. Women engage in production or collection activities, It was observed that in some cases, women are involved in all stages of Jhum—from site selection to sowing seeds, harvesting and selling these products in the market.

In all the villages of Khagrachari, KIIs identified that climatic hazards mainly erratic rainfall significantly impacted the traditional Jhum cultivation by decreasing water flow in the mountain streamlets (choras) which were the main source of water in almost all the villages of Khagrachari. Moreover, other environmental factors such as indiscriminate clearing of forests reduced the water retention capacity of soil and its moisture that impacted directly Jhum production. A male Jhum cultivator of 55 years old from the village *Bagan Para* says: ''I cannot grow all the food items at a time that I could grow earlier in my Jhum land. Rain does not pour timely that affected my Jhum cultivation. I now cultivate only turmeric, and banana that can be grown by less water usage.'' The less rainfall has also been affecting women's traditional livelihood in CHT. For example In CHT women are mainly involved in homestead gardening where they mainly grow chilies, turmeric, Banana and other vegetables and fruits. They also help their male counterparts to prepare lands for Jhum cultivation. One women of 30 years old from Poddini Para says ''I found it increasingly difficult to grow my homestead produces because of less rain. It also affected our supply of household drinking water from *choras*. Now a days At I need to go nearby villages and sometimes far to fetch drinking water home''

KIIs informed that a remarkable change took place in people's livelihood in these villages in the last 20 years. Jhum cultivation was still being practiced in most of the villages. However, the intensity was reduced in a major way. A women of 54 years old *Prodip Para* reported that the rice species that she knew when she was a child are almost extinct and the volume of harvest can no longer fulfill the family's food requirement for an entire year. Limited crop species and decreased production characterize Jum cultivation at present. She perceived that this has been observed to have been caused by warmer temperatures and soil infertility.

At present people pursue many other livelihoods alongside Jhum. For example, a section of people migrated to different cities, e.g Chittagong, Dhaka to work as garment/apparel factory worker, domestic worker, security guard etc. People in few villages catch fish in *Ghona* and work in reserve forests either in their own villages or adjacent villages or Upazilas. In reserve forests, they take care of the newly planted trees, such as watering plants, uprooting grasses**,** building earthen roads inside forests, and honey and fruit collection. A section of people in some villages work as a day labourer, autorickshaw driver; and do agriculture cultivation; homestead gardening; and collect firewood and sell in local market. Apart from these occupations, people also do share cropping, teak gardening, planting trees and livestock or dairy farming. A male fruit trader of 48 years old in the *Chotopanchori* village says: ''20 Years before my family used to do only Jhum cultivation, now along with Jhum I work as a fruit trader, and sometimes as a day labour. My son works in a garment factory in Chittagong.''

In livelihood transformation apart from climatic and environmental hazards, KIIs also spotted high population growth associated with demography led to decreasing land for Jhum cultivation in these villages in Khagrachari. The number of households in these villages substantially increased compared to 15 years before. It led to building of new houses in lands which were earlier used for Jhum cultivation. Besides, the growing attack of mosquito in Jhum farms was identified in few villages which caused health hazards such as malaria and dengu and consequently increased their health expenditure. It also led people to leave their traditional job. Economic factor for example, high household expenditure along with low income in the villages made people diversify their household income through taking up new income opportunities e.g. setting up tea stall in the villages and searching alternative livelihoods outside the villages through migration.

Jhum cultivation also dropped significantly in Rangamati over the years. In this regard KIIs identified climatic hazards e.g irregular and less rainfall that have been precipitating to the

transformation of Jhum cultivation in these villages. At present, along with Jhum cultivation people also have other occupations. A section of them catch fish in rivers and Kaptai lake. People are also involved in small businesses such as tea stall, grocery stores fruit business; timber business, etc. People also pursue migration to urban, semi urban and cities to work as a garment factory worker, security guard etc; Motor bike renting was found a growing profession in villages which have good road linkage with local Bazaar. Besides, people were also engaged in reserve forests, some work as tree fellers, plain land crop cultivator as well as homestead gardener.

Along with the climate and environmental hazards KIIs recognized economic factor such as high cultivation costs associated with increased irrigation and fertilizer costs led people to decrease agriculture cultivation in valleys or plain land in few villages. Climate factor such as erratic rainfall also made irrigation costs high as the agriculture has been mainly red fed in these villages. A male forest reserve worker, 35 years old in the *Master Para Shilchori village* who earlier used to be a full time farmer says '' Watering land and crops is very costly now. I cannot cultivate my land any more. I rent my 50 decimal land for two years to a rich bengali farmer.'' Apart from these, other economic factor i.e low income in the villages, environment i.e. attack of mosquitoes, and demographic factor i.e decreasing land were also found as significant factors that led to transform livelihood in some villages.

In plain land Chittagong, environmental factor such as river erosion gobbled agricultural land in a major way and made people change their traditional livelihood of crops production in 90 percent villages. In all the villages surveyed in Satkania, farm and off farm agriculture, such as crop production, livestock and cattle rearing were the prime livelihoods of people. A significant change in people's livelihood took place over the years in these villages. Scope for cultivation reduced notably due to river bank erosion. People now pursue jobs like boatman within village; A large number of people particularly young work as short term contract worker in the Middle Eastern countries. They work in low and semi skilled professions such as construction workers, cleaners, guard, drivers etc. Educated and semi educated people work in towns and cities in private companies, government agencies, and garment factories. A section of people from all these villages also do small businesses such as grocery shop, tea stall etc. In the villages of Hathazari, agriculture and fishing were the main livelihoods in the past. At present, the complete transformation took place in these villages. Many people had to change their fishing occupation because of institutional and policy factor as GoB put bar on fishing over Halda river as the river

has been one of the largest fish breeding points in Bangladesh. One boatman of 48 years old who was 15 years before a farmer in the *Anaullah Ukiler Para* village says: ''I had lands, I used to produce rice. My lands were eaten up by this gusty river. I had no other option left but to choose this occupation.'

Like Satkania, people in Hathazari now participate in both internal and international labour market and do the same type of jobs in destination areas and countries. A male local opinion leader, 64 years old in the *Uttor Brahman denga* village says: ''I saw over the years how the changes took place in people's livelihood in this village from agri-farmer to migrant worker. Young people do not want to work in traditional professions, They want to go abroad for work.''

2.7 Chapter conclusion

The study was conducted in the two CHT districts e.g Rangamati and Khagrachari and plain land Chittagong districts. The CHT districts are mainly mountainous which are home of 12 ethnic groups who have their distinct culture, and languages. On the other hand, the Chittagong district is a plain land which is homogenous in terms of its inhabitant's mainly included Bengali speaking people.

International migration has been a major contributor of Bangladesh macro economic development. The study looked at the international migration pattern from these two regions. It found that the plain land Chittagong is the second largest short term contract international migrant producing district in the Bangladesh whereas international migration is very low in the two CHT districts.

Both CHT districts and Chittagong have been facing climatic hazards like irregular rainfall and high temperature. However, their environmental hazards were different such as deforestation and landslide were very much pervasive in CHT whereas river bank erosion was the main stress in plain land Chittagong.

Villagers adopted different coping and adaptation strategies to deal with the hazards in districts of CHT and Chittagong. In CHT, they mostly followed autonomous adaptation strategies with a few planned adaptations. They practiced turmeric cultivation that required less water to grow;

building heat tolerant houses etc. In plain land Chittagong people mainly coped with the river erosion by moving from the erosion prone areas to the nearby non erosion areas mostly within village.

The analysis of livelihood in CHT and Plain land Chittagong shows that in both areas climatic and environmental hazards affected in a major way the traditional livelihood of people. However, they affected men and women to a varying degree because of their distinct roles and responsibilities in earning income and household management. In CHTthe extent of Jhum cultivation was substantially reduced in the villages of Rangamati that affected both male and female..Along with Jhum, people are now pursuing different kinds of livelihoods e.g work as apparel factory worker in different cities, doing small businesses, catching fish etc. In plain land Chittagong district river bank erosion grabbed agricultural land for many households that directly affected household income. People started new livelihoods such as fishing, commercial boat riding, petty trading in cities etc.

Chapter III

Potential of labour migration as one of the adaptation tools

This chapter presents the migration experiences of HHs in the three districts of CHT and plain land Chittagong. The major queries were: What were the major factors that contributed to decision to migrate or not to migrate from their original place of residence for livelihood; Did climatic and environmental hazards influence the decision of households to send members outside the village for work; More importantly, did labour migration have the potential to be used as one of the many adaptation tools in the midst of hazards. To find answer to these questions the study conducted 344 interview of internal, short term contract international and non-migrant HHs. First, the paper will present the basic information of the households that were interviewed. Then it will try to understand the factors that may have contributed to decision making of some of the families to send migrants and some other families not to send migrants. Finally it would assess the potential of migration as one of the adaptation tools by comparing the economic and social well being of migrant and non-migrant HHs.

3.1 Socio demographic profile of the HHs

Number of HH members: Number of members of STIM, internal and non-migrant households interviewed under the study is presented in table 3.1.1 The table shows that 344 interviewee households all together had 1806 members. In case of migrant families both internal and STIM, percentage of male members are higher. In case of non-migrant family percentage of female member is higher. It seems those families had better opportunity to participate in labour migration who had more male households members. In other words job opportunities in the destinations of which they were aware of, were mostly for male migrants.

Table 3.1.1 Gender of household members of Internal, STIM and non-migrants by districts

Districts	Internal			International			Non-migrant			
	Male	Female	Total	male	Female	Total	Male	Female	Total	Total Member
Khagrachori	52.20%	47.80%	100.00%	77.80%	22.20%	100.00%	47.50%	52.50%	100%	519
Chittagong	53.80%	46.20%	100.00%	54.30%	45.70%	100.00%	46.00%	54.00%	100%	663
Ranggamati	53.30%	46.70%	100.00%	56.40%	43.60%	100.00%	52.00%	48.00%	100%	624
Total Interviewee	316	281	597	213	173	386	403	420	823	1806

Average family size: Average family size of the interviewee's HHs of Khagrachari and Ranggamati is lower than that of Chittagong. Only one STIM is found in Khagrachori, and that households had 9 members. In all three districts family size of non-migrant HHs were smaller compared to internal and international migrant HHs. This indicate that these families were better equipped to migrate which had larger family size.

Table 3.1.2 Average family size by migration status and districts

Group of family size		Internal			International			Non-migrant
		Male	Female	Total	Male	Female	Total	
Khagrachori	1 - 3	14.60%	20.00%	15.70%	0.00%	0.00%	0.00%	21.80%
	4 - 5	51.20%	40.00%	49.00%	0.0%	0.0%	0.0%	60.00%
	6 - 7	26.80%	40.00%	29.40%	0.0%	0.0%	0.0%	12.70%
	8 – 10	7.40%	0.0%	5.90%	100.00%	0.0%	100.00%	5.50%
	Total	100.00%	100.00%	100.00%	100.00%	0.0%	100.00%	100.00%
Chittagong	1 - 3	5.90%	0.0%	5.3%	10.90%	0.0%	10.00%	7.30%
	4 - 5	17.60%	50.0%	21.00%	23.90%	25.0%	24.00%	48.80%
	6 - 7	64.70%	50.0%	63.20%	39.10%	25.0%	38.00%	36.60%
	8 – 10	11.80%	0.0%	10.50%	26.10%	50.0%	28.00%	7.30%
	Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Ranggamati	1 - 3	25.80%	11.1%	22.70%	9.1%	0.0%	8.3%	14.30%
	4 - 5	37.10%	44.50%	38.60%	81.80%	0.00%	75.00%	57.20%
	6 - 7	25.70%	33.30%	27.30%	9.10%	100.00%	16.70%	21.40%
	8 – 10	11.40%	11.10%	11.40%	0.0%	0.0%	0.0%	7.10%

Marital status: It was found that 35 to 49 percent of the members of these three districts were below the official marriage age. Around 48 percent of the members of Ranggamati and Khagrachari are married. In Chittagong the percentage of married member were 37.5.

Age of household members: Compared to internal and STIM HH, non-migrant HH members had relatively higher proportion of minor aged 17 or less. Members belonging to age group of 18-40 were lower in case of non-migrant families compare to internal and STIM families. Number of households who had members aged more than 60 was similar for all three types of households. This leads us to argue that those households which had higher proportion of "working age" members had more propensities to migrate.

Table 3.1.3 Age of household members by gender and migration status

Age group	Internal			International			Non-migrant		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
<=17	30.40 %	32.00 %	31.20 %	26.50 %	28.70%	27.50 %	42.20 %	39.30 %	40.70 %
18 – 25	18.70 %	24.90 %	21.60 %	22.80 %	21.60%	22.30 %	11.90 %	18.10 %	15.10 %
26 - 30	12.00 %	10.70 %	11.40 %	12.10 %	11.10%	11.70 %	9.20%	12.60 %	10.90 %
31 – 40	14.90 %	12.50 %	13.70 %	16.70 %	10.50%	14.00 %	17.40 %	12.60 %	14.90 %
41 – 50	9.50%	9.30%	9.40%	8.40%	14.60%	11.10 %	7.90%	7.90%	7.90%
51 – 60	5.40%	6.80%	6.00%	6.50%	7.60%	7.00%	5.50%	4.30%	4.90%
61 +	9.20%	3.90%	6.70%	7.00%	5.80%	6.50%	6.00%	5.20%	5.60%

Religion: 100% of the interviewee households of Chittagong belonged to Muslim religious faith. Internal migrants of Khagrachari were evenly distributed within Hindu and Buddhist faith. But in Ranggamati most of them were Buddhist. Only one migrated internationally from Khargrachari and 11 from Rangamati. All 12 of them belonged to Buddhist faith. Hindu population might have lesser access to migration network

Indigenous groups: The propensity to migrate from CHT differs based on the ethnic identity. In Khagrachari, 39.2 percent Tripura community participated in the internal labour market which was the highest in that district, followed by Chakma (25.5 percent) and Marma and (23.5 percent) respectively. In Rangamati Chakma community (40 percent) was found highest followed by Tongchya (34.3 percent), Tripura (14.3 percent) and Marma (11.4 percent) communities. In Chittagong it was 100 percent Bengali speaking community participated both in internal and STIM. Among Non migrant HH in Khagrachari Tripura constituted the highest (46.4 percent) followed by Marma (23.2 percent) and Chakma (16.1 percent). In Rangamati, Chakma

HH (40 percent) was found highest followed by Tonchongya (38.6 percent) and Marma (18.4 percent) communities.

Educational Status: Number of household members who had no education was higher in case of CHT districts compared to plain land Chittagong. Around 12 percent of household members of Chittagong had no education and in case of Khagrachari 23 percent of the household members belonged to this category. However percentage of people who had SSC degree was similar in all three districts. In Chittagong it was 20.1 percent, in Ranggamati (20.5 percent) and in Khagrachori it was 19.5 percent. Level of education might have positive correlation with migration.

3.2 Characteristics of interviewee migrants

So far this study looked into households characteristics. In this section it will particularly try to see the special characteristics of migrants.

Gender of migrant: It is found that 177 interviewee household all together had 302 migrants. 192 of them were internal migrants and 110 of them were STIM. Rangamati and Khagrachari had more internal migrants where as Chittagong was dominated by STIM. 25 percent of the internal migrants of Khagrachari and 23 percent of Rangamati were women migrants. In Chittagong only 11.40 percent were internal women migrants. More than 90 percent of STIM in all three districts were men. This indicates that women in general, be it internal or STIM had less access to migration. It was even lesser when it came to STIM.

Number of migration experience: Migration experience refers to total number of migration of each household member**.** In all three districts migrants had multiple experiences of migration. Of course it was much higher in case of internal migrants. On average internal migrants of Khagrachari migrated 7 times. Internal migrants of Rangamati migrated 14 times and from Chittagong they migrated 35 times. Many of them migrated even 100 times. They were mostly circular migrants. STIM from Chittagong on an average migrated six times. In case of Rangamati they only migrated once. This demonstrates that a section of people from each district used migration as one of the income earning strategies of their respective families.

Table 3.2.1: Average number of migration experience by districts

Migration Status			Average	Maximum	Minimum	Number
Khagrachori	Internal	Male	7	100	1	41
		Female				10
		Total	7	100	1	51
	International	Male				1
		Female				0
		Total				1
	Total	Male	7	100	1	42
		Female				10
		Total	7	100	1	52
Chittagong	Internal	Male	35	100	1	17
		Female				2
		Total	35	100	1	19
	International	Male	6	40	1	46
		Female	10	10	10	4
		Total	6	40	1	50
	Total	Male	11	100	1	63
		Female	10	10	10	6
		Total	11	100	1	69
Ranggamati	Internal	Male	14	80	1	35
		Female				9
		Total	14	80	1	44
	International	Male	1	1	1	11
		Female	1	1	1	1
		Total	1	1	1	12
	Total	Male	13	80	1	46
		Female	1	1	1	10
		Total	12	80	1	56
Total	Internal	Male	11	100	1	93
		Female				21
		Total	11	100	1	114
	International	Male	6	40	1	58
		Female	6	10	1	5
		Total	6	40	1	63
	Total	Male	10	100	1	151
		Female	6	10	1	26
		Total	10	100	1	177

Age of Migrant: Both internal and international migrants were very young. Current age of majority of the migrants was between 24 to 32 years. Very little difference was found between the mean age of internal and STIM in CHT and Chittagong. It can be argued that age was also a determining factor in respect to which member of the HH would migrate and which would not.

Though the average age of male migrants remained same (29) for both internal and STIM, however, relatively younger female population (27 years) participated in domestic labour market than overseas market. In terms of districts, internal migrants from khagrachari were found as the youngest with 28 and 24 of male and female migrant average age respectively.

Education of Migrant: Earlier studies (Siddiqui and Mahmud, 2014, Siddiqui and Abrar, 2003) found access to job market and financial remuneration had positive correlation with level of education. It is therefore important to understand the educational background of the migrants. The study found that the number of people who had no education was the lowest in plain land Chittagong (1.4 percent).

Table 3.2.2: District wise education of migrant

Education	Khagrachari	Rangamati	Chittagong	Total
Illiterate and can't sign	12 (22.6%)	2 (3.6%	1 (1.4%)	15 (8.47%)
Upto class 5	3 (5.7%)	3 (5.5%)	3 (4.3%)	9 (5.08%)
Up to class 10	12 (22.6%)	11 (20%)	16 (23.2%)	39 (22.03%)
SSC	13 (24.5%)	21 (38.2%)	17 (24.6%)	51 (28.81%)
HSC	6 (11.3%)	7 (12.7%)	19 (27.5%)	32 (18.07%)
Undergraduate	3 (5.7%)	7 (12.7%)	7 (10.1)	17 (9.60%)
Masters	0 (0%)	4 (7.3%)	2 (2.9%)	6 (3.38%)
Others	4 (7.5%)	0%	4 (5.8%)	8 (4.51%)
Total	53	55	69	177

It was also low in Rangamati but in Khagrachari as many as 22.6 percent of the migrants could not even sign their name. The percentage of migrants who had at least SSC and HSC degree was the highest in Rangamati followed by Chittagong whereas khagrachari lagged far behind.

Migration facilitation: Migration facilitation varied based on migrants type**.** In Khagrachari internal migration was mostly facilitated by friend and relative that accounted almost 75 percent of total migration. 12.5 percent migration was facilitated by contractors. In Rangamati 56.6 percent internal migration was facilitated by migrants themselves followed by friend (12.5

percent). In Chittagong 66.6 percent internal migration was facilitated by friend and broker, 33.3 percent each. On the other hand, 33.3 percent STIM was made possible by the help of government agencies in Chittagong, followed by friend (28.6 percent), relative (28.6 percent) and licensed recruiting agencies (14.3 percent). In Rangamati 100 percent STIM was facilitated by relative of migrants.

Table: 3.2.3: Facilitators of migration

		Internal			International		
		Male	Female	Total	Male	Female	Total
Khagrachori	Migrant self	8.30%	0.00%	8.30%	0.00%	0.00%	0.00%
	Family member	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Relative	16.70%	0.00%	16.70%	0.00%	0.00%	0.00%
	Friend	58.30%	0.00%	58.30%	0.00%	0.00%	0.00%
	Contractor	12.50%	0.00%	12.50%	0.00%	0.00%	0.00%
	Broker	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Licensed recruiting agent	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Governme nt/BMET	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Other (specify)	4.20%	0.00%	4.20%	0.00%	0.00%	0.00%
Chittagong	Migrant self	0.00%	0.00%	0.00%	14.30%	0.00%	13.30%
	Family member	33.30%	0.00%	33.30%	0.00%	0.00%	0.00%
	Relative	0.00%	0.00%	0.00%	28.60%	0.00%	26.70%
	Friend	0.00%	0.00%	0.00%	28.60%	0.00%	26.70%
	Contractor	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Broker	33.30%	0.00%	33.30%	7.10%	100.00%	13.30%
	Licensed recruiting agent	0.00%	0.00%	0.00%	14.30%	0.00%	13.30%
	Governme nt/BMET	0.00%	0.00%	0.00%	33.30%	0.00%	33.30%
	Other (specify)	0.00%	0.00%	0.00%	7.10%	0.00%	6.70%
Ranggamati	Migrant self	55.60%	0.00%	55.60%	0.00%	0.00%	0.00%
	Family member	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Relative	11.10%	0.00%	11.10%	100.00%	100.00%	100.00%
	Friend	22.20%	0.00%	22.20%	0.00%	0.00%	0.00%
	Contractor	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Broker	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Licenced recruiting agent	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Governme nt/BMET	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Other (specify)	11.10%	0.00%	11.10%	0.00%	0.00%	0.00%

Migration finance: Migrants garnered their migration finance from different sources. In Khagrachari, the bulk of the internal migrants (77.3 percent) financed their migration from their own savings followed by loan from money lender (9.1 percent). In Rangamati 55.6 percents internal migrants financed their migration from their own savings followed by family savings (11.1 percent), advance from employer (11.1 percent). In Chittagong, 100 percent internal migrants collected migration costs from their own sources. On the other hand, 28.6 percent STIM from Chittagong financed their migration from own savings, loan from extended family and 21% took bank loan. In Rangamati 100% STIM financed their migration from their own savings.

3.2.4 Financing of migration by Type and Gender

		Internal			International			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Khagrachori	Own Savings	77.3%	0.0%	77.3%	0.0%	0.0%	0.0%	77.3%	0.0%	77.3%
	Family Savings	9.1%	0.0%	9.1%	0.0%	0.0%	0.0%	9.1%	0.0%	9.1%
	Loan from moneylender	9.1%	0.0%	9.1%	0.0%	0.0%	0.0%	9.1%	0.0%	9.1%
	Sale of other assets	4.5%	0.0%	4.5%	0.0%	0.0%	0.0%	4.5%	0.0%	4.5%
	Total	100.0%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
Chittagong	Own Savings	100.0%	0.0%	100.0%	28.6%	0.0%	26.7%	41.2%	0.0%	38.9%
	Family Savings	0.0%	0.0%	0.0%	7.1%	0.0%	6.7%	5.9%	0.0%	5.6%
	Loan from extended family	0.0%	0.0%	0.0%	28.6%	0.0%	26.7%	23.5%	0.0%	22.2%
	Loan from moneylender	0.0%	0.0%	0.0%	14.3%	0.0%	13.3%	11.8%	0.0%	11.1%
	Bank Loan	0.0%	0.0%	0.0%	21.4%	0.0%	20.0%	17.6%	0.0%	16.7%
	Sale of land	0.0%	0.0%	0.0%	0.0%	100.0%	6.7%	0.0%	100.0%	5.6%
	Total	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Ranggamati	Own Savings	55.6%	0.0%	55.6%	100.0%	100.0%	100.0%	60.0%	100.0%	63.3%
	Family Savings	11.1%	0.0%	11.1%	0.0%	0.0%	0.0%	10.0%	0.0%	9.1%
	Bank Loan	11.1%	0.0%	11.1%	0.0%	0.0%	0.0%	10.0%	0.0%	9.1%

	Advance from recruitment agency	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Advance from employer	11.1 %	0.0%	11.1%	0.0%	0.0%	0.0%	10.0%	0.0%	9.1%
	Other (specify)	11.1 %	0.0%	11.1%	0.0%	0.0%	0.0%	10.0%	0.0%	9.1%
	Total	100.0 %	0.0%	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %	100.0 %

3.3 Why some people migrated and some other did not

Factors contributing to migration decision

Migration decision is extremely complex. Earlier studies (Martin et al., 2014; Siddiqui and Mahmud, 2014) showed that people mostly highlighted economic rationale behind their migration decision. This was precisely why foresight (2012) report discouraged segregating environmental factors from other social, economic, demographic and political factors. It showed that environmental drivers influence all other drivers of migration. Following foresight report suggestion, this study systematically inquired about all types of drivers as well as personal and HH characteristics and intervening obstacles and facilitators that might have contributed to migration decision. Through open ended question it collected the migration decision making stories of both migrant and non-migrants. Through the use of MS Excel programme it then arranged them under the foresight framework**.**

Environmental considerations: 177 internal and STIM identified 797 environmental stresses and their impacts that might have played some influence over the migration decision of their household members. Among environmental and climatic hazards, rise of temperature was mentioned 86 times. Respondents of Rangamati spoke of this more. Low rainfall was mentioned 66 times and issue of river erosion surfaced 53 times, and it was mostly mentioned by the people of Chittagong. Drying up of mountain streamlets was mentioned 60 times.

Table 3.3.1: climatic and environmental hazards and their impacts

Climatic and Environmental hazards	**Districts name**			**Total**
	Rangamati	**Khagrachori**	**Chittagong**	
Low rainfall/Irregular rainfall/Excessive rainfall in	66	36	22	124

short period				
Temperature rising	47	26	13	86
Deforestation	15	20	3	38
Landslide	20	5	0	25
Drought/ Lowering of water level	20	10	0	30
Flood	11	0	11	22
River erosion	2	0	51	53
Drying up of mountain streamlets	91	19	0	110
Cyclone	4	1	2	7
Earthquake	6	0	2	8
Impacts of Hazards				
Inundation/Water logging	2	0	37	39
Water crisis for irrigation/day to day use/ Drinking water crisis	120	29	2	151
Increased sedimentation and reduced water depth	0	1	3	4
Reducing production of Jhum, Onion and Tobacco cultivation	33	20	4	57
Reducing soil quality	0	0	2	2
Salinity	0	0	3	3
Damaged house by tidal water	0	0	7	7
Use more pesticides, fertilizer to produce agro-production	5	3	2	10
Reducing wild animals	9	8	0	17
Reducing fishes in the river	2	0	0	2
Increase diseases	0	0	2	2
Grand Total	**453**	**178**	**166**	**797**

Economic considerations: From 177 internal migrant and STIM of three districts this study received 236 responses which were brought under the broad head of economic factors. Increasing income was mentioned 142 times; lack of employment at local level was mentioned 51 times. Low wage in origin was mentioned 15 times. Migrations provided better livelihood options were mentioned 10 times; migration provided opportunity to reduce household poverty was mentioned 15 times.

3.3.2 Table: Economic considerations behind migration decision by districts

Economic Considerations	**Districts name**			**Total**
	Rangamati	**Khagrachori**	**Chittagong**	
Increase income	56	40	46	142
Lack of jobs/employment opportunities	13	15	23	51
Low wage	10	1	4	15
Better livelihood in destination	6	2	2	10
Remove poverty	3	0	12	15

Increase cost of agricultural production	0	1	0	1
Increase assets like land	0	0	2	2
Grand total	**88**	**59**	**89**	**236**

Social considerations: 67 responses highlight social considerations. 30 of them identified "to ensure better quality of life or wellbeing of the households as one of the consideration". 12 responses indicated "better education for children" and 6 responses where about accessing better medical facilities. Constrains of place of origin was also considered while deciding to migrate. Lack of communication system, bad road network in one hand and better amenities were available in Rangamati Sadar districts. Enhancing social status, increasing asset based in rural areas or to learn Bangla language were also considered while taking migration decision.

3.3.3 Table: Social considerations behind migration decision by districts

Social Considerations	**Districts name**			**Total**
	Rangamati	**Khagrachori**	**Chittagong**	
Family wellbeing	4	0	4	8
To lead a better life in city	2	4	16	22
Better medical facilities	6	0	0	6
Better education for children	12	0	0	12
Good health care services	1	0	0	1
Education for family member	1	0	0	1
Lack of communication system	1	0	0	1
To develop social status	0	0	4	4
Remote area and bad road network	6	0	0	6
To learn Bangla language	2	2	0	4
To increase assets in rural areas	1	1	0	2
Grand total	**37**	**7**	**24**	**67**

Demographic considerations: 23 responses fit in very well under demographic consideration. 15 mentioned that over the years family size has increased particularly through marriage. Now that more lands are not allowed for cultivation through clearing the forest, most of the hill families either had to build homestead, in those land which they earlier used for Jhum cultivation or a few member needed to migrate for job. Natural increase in family size, increase in number of married couple within the family, lack of availability of land for constructing additional homestead were identified as reasons for migration. Feeding large family was also treated as a demographic issue.

3.3.4 Table: Demographic considerations behind migration decision by districts

Demographic Considerations	Districts name			Total
	Rangamati	Khagrachori	Chittagong	
Gradual expansion of family size	6	6	5	17
Small residence and marriage other son/daughter and stay at the same place	0	3	0	3
No space homestead land	0	0	1	1
large family	1	0	0	1
Marriage migration	1	0	0	1
Grand total	8	9	6	23

Political considerations: Only few responses were received which identified political problem in the origin area as a consideration. Four responses raised concerns which were political in nature. After signing of the peace treaty, political activists of CHT region divided into two groups. One group supported the peace treaty and other group opposed it. Both the group tried to tag mass CHT people into their conflict.

Personal and HH characteristics: Personal and HH characteristics played a role in migration decision making. This study received four responses which highlighted individual attitude and personal loss acted as drivers of migration for a few. Individual's desire to do something was reflected in the response when someone said, "migration provided me with an opportunity to earn on my own", whereas, some other individual who stayed back in the origin area might not feel that way. Some individuals wanted to stay in their areas of origin however some others desired to experience city life. One member mentioned their HH members wanted to live in Dhaka city. Such response highlights differences in individuals' attitude towards life. Responses such as "loss of business" highlighted special situations of individual households which might have contributed to migration decision.

3.3.5 Table: Personal and household characteristics

Personal and household characteristics	Rangamati	Khagrachari	Chittagong	Total
wanted to do something on my own	1	0	0	1
Desire to earn by my self				
Desire to stay in Rangamati/Dhaka city	1	1	0	2
Big loss in business	1	0	0	1
Total	3	1	0	4

3.3.6 Intervening obstacles and facilitators

Obstacles and facilitators	Rangamati	Khagrachari	Chittagong	Total
Pre-existing social network	20	25	50	95

3.4 Factors contributing to non-migration in the context of environmental hard ships

Migrant and non migrant HHs more or less faced similar environmental stresses. It was due to interplay of other macro, micro and meso level factors some of the HH decided against sending any family members outside the village for work. In the following, factors they considered for not deciding to send a family member to work out side are presented below. It was received altogether 186 responses of non-migrant that highlighted why their family member did not migrate. This study separated them under same seven heads-economic, social, demographic, political, personal and intervening obstructers or facilitators.

Environmental hardships: The non migrant households highlighted 584 times of 28 types of climatic and environmental hazards and their impacts. The respondents mentioned the issue of temperature rise 84 times and water crisis came 85 times. Drinking water crisis was mentioned again 41 times. Low/irregular/excessive rainfall in some season appeared 72 times. Issue of river erosion was mentioned 47 times and drying up of mountain streamlets came 36 times. Low/irregular/heavy rainfall was pronounced 73 times. However they did not think of migration as one of the livelihood paths to be followed for various reasons. Members of these households did not migrate even after facing these hazards. Combination of other social, economic, demographic, individual characteristics as well as lack of information or facilitating networks produced the situation where none of the members of these households migrated.

Table: Climatic and environmental hazards and their impacts

3.4.1 Climate and Environmental Hazards and their impacts

Climatic and Environmental Hazards	Districts name			Total
	Rangamati	Khagrachori	Chittagong	
Irregular /Heavy/low rainfall	21	38	14	73

Temperature rise	46	23	15	84
Deforestation	15	28	0	43
River erosion	03	0	47	50
Hill slide/Land slide	17	11	0	28
Drought/ Lowering of water level	17	15	0	**32**
Flood	2	0	4	6
Cyclone	0	0	3	3
Earthquake	8	1	1	10
Total- 9 Hazards				
Impacts of Hazards				
Drying of Mountain streamlets	21	15	0	36
Water crisis for irrigation/day to day use/ Drinking water crisis	86	40	0	126
Increase sediment and reducing water flow/low river bed	7	5	0	12
Reducing production of Jhum, Onion and Tobacco cultivation	23	23	1	47
Reducing soil fertility	5	5	0	10
Reducing fishes in the river	3	0	3	6
Reducing wild animals	0	9	0	9
Use more pesticides, fertilizer to produce agro-production	0	1	0	1
Water pollution	0	3	0	3
Reducing medicinal plants	2	0	0	2
Decreasing ecological balance	**3**	**0**	**0**	**3**
Increase diseases	0	1	0	1
Total	279	217	88	584

Economic considerations: Altogether 51 responses were received which was brought under the head of economic considerations. Two responses mentioned that their families were economically solvent so even in the context of extra environmental hardship they could manage locally. Two responses mentioned that they were trying to adapt locally. Another two were experimenting to produce different crops e.g turmeric and tobacco which required less water. In order to meet the challenge of shortage of water one of them transformed their agricultural fields

in to fruit orchards. Another of them experimented with rubber plantation. Another person took land on lease from households who did not cultivate. Six responses indicated that the high cost of living in the destination deterred them from allowing HH members to migrate for work. 20 responses mentioned that economic inability to bear migration cost was the main reason for not migrating. These HHs wanted to send one of their family members to Gulf or South East Asian countries to earn a livelihood as a short term contract worker. However, due to high cost of migration and lack of financial resources they could not send any one.

3.4.2 Table: Economic considerations behind non-migration decision by districts

Economic Considerations	**Districts name**			**Total**
	Rangamati	**Khagrachori**	**Chittagong**	
Solvent family	2	0	0	2
Sublease cultivation	0	1	0	1
Rubber/fruit cultivation	0	2	0	2
High living cost of destination	5	2	3	10
Inability to bear to go migration cost	11	4	5	20
High expenditure in town	1	2	0	3
Lack of government skill and loan programme to support programme	4	5	5	14
Adapt local climatic stresses	2	0	0	2
Grand Total	25	16	13	54

Social considerations: 115 responses were received which are bracketed under social factors behind the decision of non migration. 41 responses clearly indicated that these HHs did not have any interest to send their members out-side their village for work. To some of them, staying together surrounded by relatives was very important. Some had deep attachment with their place of birth and did not want to leave from there for any-thing. Some others did not like the idea of living in dirty slums in urban areas. To quote one respondent who was from plain land Chittagong said that: 'Poor living condition in the cities could increase health hazards of our family members''. 35 responses indicated that jobs in urban areas required certain skills and family members who could have participated to out-side labour market did not have those skills. Government neither has relevant skills training centers nor does it have migration finance loan programmes in their locality. 27 thought to go to urban areas where there was job and the

requirement was having the ability to read the signs. Their family members who could have migrated for work had no literacy at all.

3.4.3 Table: Social considerations behind non-migration decision by districts

Social Considerations	Districts name			Total
	Rangamati	Khagrachori	Chittagong	
Unskilled	24	10	1	35
Lack education	17	7	3	27
Uncertainty	3	3	1	7
No interest to go outside/birthplace/relatives are more important	27	13	1	41
Afraid of uncertainty in new area	1	0	0	1
Solvent family	2	0	0	2
Language problem	0	1	0	1
Loss their freedom	1	0	0	1
Grand Total	75	34	6	115

Demographic considerations: Thirty nine responses directly indicated to the demography of the HHs. Seven mentioned that their family size was small. So if the working age person migrates then there would be no one in the family to look after the HH. Two families stated that they only had elderly people. Only those HHs participated in labour migration that had young working age population. Few families only had female working age members. From these areas it was mostly men who migrated. So HH with female members had less opportunity to participate in migration.

3.4.4 Table: Demographic considerations behind non-migration decision by districts

Demographic Considerations	Districts name			Total
	Rangamati	Khagrachori	Chittagong	
Small family/To take care of his/her family	3	3	1	7
More female members	0	0	1	1
Widow/aged people	0	1	1	2

No baby	0	0	2	2
Physical problem	0	1	0	1
Grand Total	03	05	5	13

Political considerations: Five responses from CHT indicated towards political factors against decision not to migrate. They feared that they might lose their lands if they remain absent from their villages. Some of them also indicated to their different ethnic identity and bio-physical structure as problematic that can act as source of discrimination in the job sectors in cities and abroad.

Personal and HH characteristics: Some of the considerations that are mentioned under demography and social can also be explained as personal and HH characteristics.
Table: Personal and HH characteristics

3.4.5 Personal and HH characteristics

Family members do not posses necessary skill	24	10	1	35
Language problem	5	5	0	10
Loss of freedom	1	0	0	1
No interest to go outside	16	9	1	26
Members do not have education	17	7	3	27
Total	63	31	5	99

Intervening obstacles: 34 responses indicated towards some obstacles in the decision making processes to migrate. Information gap, not knowing anyone in destination, no knowledge about availability of type of job or the wage rate, bad physical communication and remoteness of their area of origin was mentioned as obstacles to migration decision.

3.4.6 Table: Intervening obstacles and facilitators

Obstacles and facilitators	**Districts name**			**Total**
	Rangamati	**Khagrachori**	**Chittagong**	
Don't know anyone in any destination	7	5	4	16
No knowledge in wage	3	0	1	4
Lack of communication facilities	4	0	2	6
Bad road networking system from origin	0	1	6	7

Information gap	0	1	0	1
Inability to bear migration cost	11	4	5	20
Grand Total	25	11	18	54

3.5 Potential of migration as one of the adaptation tools

Studies (Martin et al., 2014; Siddiqui and Billah, 2014) showed that migration of a few members from a family increases adaptation capacity of HHs affected by climatic and environmental hazards. Remittances increase HH income that enabled them to adapt with the changing situations caused by hazards. In this section we will see compare to non migrants if internal or international migrants have greater opportunity to adapt while facing challenges thrown by climatic or other sources.

Remittance pattern: The study inquired about monthly remittance inflows of both internal and STIM HHs. Table 3.5.1 shows that the amount of remittance was much lower in case of two CHT districts compared to plain land district. In Khagrchari it was BDT 1063.49, in Rangamati it was BDT 1,425 whereas monthly internal remittance to plain land Chittagong was BDT 6, 622. In other words internal remittance flow in plain land Chittagong was 75 percent higher than the CHT districts.

Number of STIM was much lower in case of two CHT districts. However, average monthly remittance flow was highest in Rangamati which was BDT 10,375 followed by plain land Chittagong which was BDT 9198.72 and the lowest was found in Khagrachari (BDT 6666.67). It is obvious that remittance of STIM is much higher compared to internal migrants. Nonetheless the cost of STIM is also exorbitantly higher compared to internal migration.

A comparison of flow of remittance among male and female migrant show that female migrant remitted much less compared to male migrants. Of course such statement was not accurate as they were not involved in similar jobs and their salary was also lower.

Table 3.5.1: Average monthly remittance

Average Monthly Remittance by gender and districts	Monthly_Remittance
	Mean

DISTRICT	Khagrachori	Internal	Male	1130.30
			Female	818.52
			Total	1063.49
		International	Male	6666.67
			Female	N/A
			Total	6666.67
	Chittagong	Internal	Male	6848.96
			Female	3000.00
			Total	6622.55
		International	Male	9340.28
			Female	7500.00
			Total	9198.72
	Ranggamati	Internal	Male	1677.54
			Female	595.24
			Total	1425.00
		International	Male	11481.48
			Female	416.67
			Total	10375.00

Remittance Channels: Migrants used different channels to send their remittances back home. Internal migrants in Khagrachari, Rangmati mostly carried money home while they themselves or their friends and neighbbours visited their homes. The second most used method of transfer was bank led mobile solution. Conversely, 100 percent internal migrants in Chittagong brought money with them while visiting home. 62 percent STIM in Chittagong used Bank to bank and instant cash method. Interestingly as high as 25 percent still use Hundi to transfer the money home. In Rangamati 100% STIM bank led mobile solution for sending remittances.

3.5.2 Main Method of sending remittance

Method of sending remittance		Internal			International		
		Male	Female	Total	Male	Female	Total
Khagrachori	Cheque/demand draft	5.0%	0.0%	5.0%	0.0%	0.0%	0.0%
	Exchange house to bank account	5.0%	0.0%	5.0%	0.0%	0.0%	0.0%
	Mobile banking	20.0%	0.0%	20.0%	0.0%	0.0%	0.0%
	Bus transport companies	5.0%	0.0%	5.0%	0.0%	0.0%	0.0%
	Migrant brings the money home	45.0%	0.0%	45.0%	0.0%	0.0%	0.0%

	Friend travelling back to Bangladesh	20.0%	0.0%	20.0%	0.0%	0.0%	0.0%
	Total	100.0 %	0.0%	100.0 %	0.0%	0.0%	0.0%
Chittagong	Bank account to bank account	0.0%	0.0%	0.0%	57.1%	100.0 %	62.5%
	Exchange house to bank account	0.0%	0.0%	0.0%	14.3%	0.0%	12.5%
	Migrant brings the money home	100.0 %	0.0%	100.0 %	0.0%	0.0%	0.0%
	Hundi	0.0%	0.0%	0.0%	28.6%	0.0%	25.0%
	Total	100.0 %	0.0%	100.0 %	100.0 %	100.0 %	100.0 %
Ranggamati	Mobile banking	25.0%	0.0%	25.0%	0.0%	100.0 %	100.0 %
	Migrant brings the money home	75.0%	0.0%	75.0%	0.0%	0.0%	0.0%
	Total	100.0 %	0.0%	100.0 %	0.0%	100.0 %	100.0 %

HHs expenditure and share of remittance: Compare to internal and non-migrant HHs expenditure of international migrant was higher in all three districts and it was highest in Chittagong. Expenditure of STIM HHs was also high in Khagrachari, however there was only one case of STIM HH.

Around 15 percent of the HHs expenditure of internal migrants of Khagrachari came from remittances. In case of STIM, 55 percent of the HHs expenditure came from migrants' remittances. For Rangamati, Remittance constituted 21 percent of internal migrants HHs expenditure. In case of STIM, HHs average remittance was higher than their average HHs expenditure. In case of internal migrants of Chittagong more than 59 percent of the HHs expenditure derived from remittances and in case of STIM it was 73 percent

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It is obvious that labour migration brings in additional income to the households. Therefore in the context of climatic and environmental hazards labour migration does open up opportunity for extra income.

Table 3.5.3: Share of remittance in HHs expenditure of internal and international migrants

Migration Status			Average Monthly Expenditure		Average Monthly Remittance	Share of remittance in HH expenditure in %
			Mean	Number	Mean	
Khagrachori	Internal	Male	7232.66	41	1130.30	15.63%
		Female	5563.57	10	818.52	14.71%
		Total	6905.39	51	1063.49	15.40%
	International	Male	12156.33	1	6666.67	54.84%
		Female		0		
		Total	12156.33	1	6666.67	54.84%
	Non-migrant	Total	6954.41	56		
Chittagong	Internal	Male	11502.34	17	6848.96	59.54%
		Female	8296.25	2	3000.00	36.16%
		Total	11164.86	19	6622.55	59.32%
	International	Male	12488.55	46	9340.28	74.79%
		Female	13901.25	4	7500.00	53.95%
		Total	12601.56	50	9198.72	73%
	Non-migrant	Total	9324.06	41		
Ranggamati	Internal	Male	6688.09	35	1677.54	25%
		Female	7510.49	9	595.24	8%
		Total	6856.31	44	1425.00	20.80%
	International	Male	9155.20	11	11481.48	125.4%
		Female	14305.00	1	416.67	2.9%
		Total	9584.35	12	10375.00	108.25%
	Non-migrant	Total	7608.28	70		

Land Holding pattern: Land ownership system in plain land and CHT districts are different. In CHT land is owned communally and each family takes possession of land from the village headman. In this section land holding is defined as amount of land of which a HH has possession. The respondents mostly possessed two types of lands, homestead and agricultural land. Homestead land was highest in Khagrachori and lowest in Chittagong. Not much of a difference was observed among internal, international and non migrant HHs of Khagrachori and Rangamati. Homestead land size of internal migrants of Rangamati was 41decimal, for STIM it was 31 decimal and for non migrant it was 38 decimal. In case of Khagrachori, it varied between 80 to 88 decimals. Homestead land size although was similar among internal migrants and STIM of plain land Chittagong yet it was much lower in case of non migrant HHs of that area. When it was compared among male and female migrant HHs, homestead land size of the latter was much lower.

Size of agricultural land was similar among internal STIM and non migrant HHs of Khagrachori, however non migrant HHs of Rangamati possesed double (213 decimal) the land compared to the internal (81 decimal) and STIM (61 decimal) of that area. Internal and STIM HHs of Chittagong on the other hand possessed much larger amount of agricultural land (226 and 153 decimal respectively), compared to the non migrants (90 decimal) of the district.

Table 3.5.4: Size of home stead land by district and gender

	Internal			International			Non-migrant
District	Male	Female	Total	Male	Female	Total	
Khagrachori	100.00	32.50	88.51	80.00		80.00	84.42
Chittagong	33.65	26.00	32.84	35.00	11.33	33.42	18.09
Ranggamati	40.91	39.29	40.63	30.45	40.00	31.25	38.13
Total	65.14	34.53	60.28	34.91	18.50	33.78	49.66

Table 3.5.5: Size of agricultural land by district and gender

	Internal			International			Non-migrant
District	Male	Female	Total	Male	Female	Total	
Khagrachori	130.71	187.50	143.33	200.00		200.00	150.70
Chittagong	256.67	40.00	225.71	155.81	100.00	152.53	90.77
Ranggamati	79.13	90.25	80.78	41.50	260.00	61.36	213.29
Total	123.16	146.23	127.44	115.11	180.00	119.59	176.98

Sources of power/Light: An important indicator of quality of living of the household is availability of electricity at the household level. it is found that there was a mark difference both in respect to migration status as well as district, in use of sources of power by different households. In Khagrachari, 13.5 percent and in Ranggamati 39.3 percent households used electricity as their main source of power. Whereas, in Chittagong around 60 percent of the households used electricity. 35.7 percent of the households of the Ranggamati used solar panel. 14.9 percent of the households of Khagrachari use solar panel. As high as 71% of households used kerosene as a source of power. A comparison between internal and STIM households shows that STIMs were major consumers of electricity. In Chittagong and Khagrachari compared to internal migrant households, non-migrant households had lesser

access to electricity. However in Ranggamati non-migrant households had higher access to electricity compared to internal migrant households.

Main sources of drinking water: For drinking water interviewee's households used different sources. These included tube well mountain streamlets; river, pond or lake water and rain water. In Chittagong almost 100% of the households had drinking water source from tube well or deep tube well, in case of Khagrachari it was almost half. Use of mountain streamlets water was quite high in Rangamati.

Table 3.5.6: Main sources of drinking water by districts

Migration status		Rainwater		Tube well/deep tube well		pond/River/Lake		Fountain water/stream		Others		Total	
Khagrachori	Internal	0	0.00%	22	43.10%	5	9.80%	15	29.40%	9	17.60%	51	100.00%
	International	0	0.00%	0	0.00%	0	0.00%	0	0.00%	1	100.00%	1	100.00%
	Non-migrant	0	0.00%	25	44.60%	4	7.10%	5	8.90%	22	39.30%	56	100.00%
Chittagong	Internal	0	0.00%	19	100.00%	0	0.00%	0	0.00%	0	0.00%	19	100.00%
	International	0	0.00%	50	100.00%	0	0.00%	0	0.00%	0	0.00%	50	100.00%
	Non-migrant	0	0.00%	40	97.60%	1	2.40%	0	0.00%	0	0.00%	41	100.00%
Ranggamati	Internal	0	0.00%	10	22.70%	14	31.80%	15	34.10%	5	11.40%	44	100.00%
	International	0	0.00%	4	33.30%	2	16.70%	5	41.70%	1	8.30%	12	100.00%
	Non-migrant	0	0.00%	25	35.70%	7	10.00%	32	45.70%	6	8.60%	70	100.00%

Type of Toilet: Internal migrant and STIM households as well as non-migrant households mostly used sanitary toilet with or without water seal. Sanitary toilets with water seal were mostly used by STIM households. Almost half of the households from Khagrachari and Ranggamati used *Kacha* toilet. The comparison between internal and STIM households with non-migrant households showed that the number of people using *Kacha* toilet were higher among non-migrants HH of Chittagong and Ranggamati districts. In case of Khagrachari compared to non-migrant HH, internal migrant households used kacha toilet more. Use of open area was almost nonexistent among all types of households. Only 2 internal and 2 non-migrant households of Khagrachari used open area.

Table 3.5.7: Type of Toilet by migration status and districts

Migration status		Sanitary(with water seal)		Sanitary (without water seal)		Not Sanitary (Kacha toilet)		Open area		Total	
Khagrachori	Internal	0	0.00%	21	41.20%	28	54.90%	2	3.90%	51	100.00%
	International	0	0.00%	1	100.00%	0	0.00%	0	0.00%	1	100.00%
	Non-migrant	1	1.80%	32	57.10%	21	37.50%	2	3.60%	56	100.00%
Chittagong	Internal	2	10.50%	12	63.20%	5	26.30%	0	0.00%	19	100.00%
	International	11	22.00%	24	48.00%	15	30.00%	0	0.00%	50	100.00%
	Non-migrant	3	7.30%	20	48.80%	18	43.90%	0	0.00%	41	100.00%
Ranggamati	Internal	10	22.70%	12	27.30%	22	50.00%	0	0.00%	44	100.00%
	International	4	33.30%	2	16.70%	6	50.00%	0	0.00%	12	100.00%
	Non-migrant	11	15.70%	14	20.00%	45	64.30%	0	0.00%	70	100.00%

Type of homestead: Homestead in these three districts was predominantly made of mud followed by bamboo. In Khagrachari more than 90 percent of houses were made by mud. In case of Rangamati more than 80 percent of the homesteads of both internal and STIM were made of mud. Percentages of mud houses were also quite high in Chittagong. However in comparison to other two districts it was less. Twenty percent of the STIM households had wooden houses. Only one non-migrant HH each from Khagrachari and Ranggamati had homestead made of tin. In case of Chittagong 16 percent of the STIM households and five percent of the non-migrant household's possessed homestead made of tin.

Asset Base of Migrant and Non- Migrant Household: The study further inquired the household asset base of migrant and non migrant households in order to understand the living standard of migrant and non migrant households. The asset base is also an important indicator that shapes and determines the households' potential adaptive capacity against climatic and environmental hazards. The study inquired on 19 household assets including good houses to tubewell, and good toilet to mobile phone and television. First it tried to find out district wise asset base between migrant HH and Non migrant HH. Then it overall compared between migrant and non migrant HH.

Television is an avenue of entertainment as well as a source of information. It seems that both migrant and non migrant HHs of Khagrachori, had lesser access to television. 50 percent of the STIM, 26 percent of the internal migrants and 4.9 percent of the non migrants HH of Rangamati owned television. Almost half the HHs of all types, internal, STIM and non migrant HH of Chittagong owned television.

Access to mobile phone among all categories of interviewees was the highest in Rangamati. 95 percent of internal migrants, 94 percent of international migrants and 83 percent of non-migrant households had mobile phones. Ownership of mobile phone was the lowest in Khagrachori. 55 percent of internal, 100 percent of STIM and 55 percent of non-migrant HH had mobiles. Interestingly, in Chittagong the highest proportion of non-migrant households (80 percent) had mobile phones. 67 percent of the STIM and 59 percent of the internal migrants had such ownership.

None of the households of Khagrachori had laptop or computers. In Rangamati 5.3 percent of internal and 4 percent of STIM owned laptops. Possession of laptop was relatively higher among respondents of Chittagong. 6.8 percent of internal, 8.3 percent of STIM and 2.9 percent of non-migrant households owned computers.

None of the respondents of any category Khagrachori owned refrigerators whereas 21 percent of internal and 42 percent of STIM of Rangamati owned refrigerators. 4.5 percent of internal migrant households, 25 percent STIM households and 6 percent of non-migrant household of Chittagong owned refrigerators.

In Khagrachari, It was found that Non migrant HH had better asset base than migrant HH particularly internal migrant HH. Out of 19 categories only in four categories migrant HH had more share. These were for example television, fan, oven and bicycle. However, STIM were found having more assets than non migrant HH in six types of assets which were telephone, mobile phone, solar panel, bed, almira, and sewing machine.

In Rangamati, It was found that overall migrant HH had far more better asset base than non migrant HH. Only in solar panel category non migrant HH had a better share thaHHn Internal migrant. Between Internal migrant HH and STIM asset base STIM HH were found having more assets. Only in five categories Internal migrant HH had better share which were computer, laptop, sewing machine, motor cycle, and bi-cycle.

In Chittagong, It was found that overall migrant HH had more assets than non migrant HH. Only in four categories of assets non migrant HH had a better share than Internal migrant. Those were fridge, computer, mobile phone and radio. Between Internal migrant and STIM asset

base, STIM HH was found having more assets. Only in six categories Internal migrant HH had better share which were solar panel, almira, sewing machine, bi- cycle, and others.

Having 17 categories of assets compared to non migrant HH. The higher number of non-migrant HH was found only with regard to mobile phone (72.3 percent) and solar panel (20.4 percent) in comparison to 72.3 percent and 13.6 percent of migrant HH respectively. Among the surveyed HH 12.4 percent migrant HH had good houses which were made of wood, tin and brick wall in relation to 6.6 percent of non migrant HH. 39.5 percent migrant HH had electric connection which was available in 27.5 percent non migrant HH. Moreover, 58.8 percent and 15.3 percent migrant HH had tube well and sanitary toilet where as 53.9 percent and 9 percent non migrant HH had tube well and good toilet. Migrants HH also had more television (36.2 percent) than non migrant HH (22.2 percent).

3.6 Chapter conclusions

This chapter concludes that migration decisions are extremely complex. Both internal migrant and STIM HH took economic, social, demographic, environmental and to some extent political situation of their surroundings into consideration while deciding whether to migrate or not to migrate. These factors influenced their migration decisions. However after facing same types of situations, some decided to migrate and some other decided to stay back. Individual or household attitude towards migration, attachment with place of origin, family size of the households, availability or non availability of working age male population within the household, determined if a household would send one or two members to work and earn a livelihood outside the village. Along with individual and household characteristics access or lack of access to migration information, having or not having any known person in destination, access or lack of access to social network, ability or inability to bear the migration cost allowed some households to decide in favour of migration or some other households against migration.
This section also analyzed if the migrant households were better equipped to face the challenges of livelihood and income loss compared to those who did not migrate.

Chapter IV
Policy analysis

In this chapter this study will mainly analyze climate change, migration and development issues of Chittagong Hill Tracts Region under the existing national level policies related to those issues. First, it will evaluate climate change related policies and strategies in order to find out how CHT climate change stresses have been seen and addressed in those instruments. Thereafter, it will assess how these policies view migration in the context of climate change, and what type of actions did they suggest. The policy analyses are summarized as follows:

4.1 National adaptation program of action

Bangladesh adopted its national adaptation program of action and submitted it to UNFCCC in 2005. The uptake of NAPA involved the processes of four stakeholders' workshops at sub-national level along with a national workshop. These workshops produced six sectoral background papers that included agriculture, fisheries and livestock; forestry, biodiversity and land-use; water, coastal zone, natural disasters and health, livelihood, gender, local governance and food security, industry and infrastructure and policies and institutes. It mainly identified the impact of climate stimuli or extreme events on water sources including fresh water scarcity, drainage congestion, river bank erosion, frequent floods, prolonged drought and salinity in the coastal zone. However, NAPA did not identify other forms of climatic stresses which are faced by CHT region. The realities of CHT are different, for example, it mainly faces erratic rainfall and rising temperature which slowly affects the entire eco-system. Therefore, climate change problems of CHT was absent in the national adaptation plans. NAPA undertook 15 priority projects. Among these projects, only the 'Community Based Adaptation to Climate Change through Coastal Afforestation' project secured funding from the LDC Fund. The another important project was on reducing coastal vulnerability which was expected to link further with the UNDP-DFiD funded Comprehensive Disaster Management Programme (CDMP) and other biodiversity and livelihood projects. NAPA was subsequently updated in 2009 to include wider adaptation requirements and identified 45 adaptation measures of which 18 have been prioritized. None of these projects included CHT specific programmes. The evaluation of the process of this plan shows that civil society bodies also did not suggest the incorporation of programmes that would address the stresses faced by CHT. BCAS in collaboration with UNDP identified major climatic stresses in the CHT in their scientific study conducted between 2005-

2006. The findings of the study should have been taken into cognizance while designing these projects.

Now let us look into how NAPA conceptualized migration in the context of climate change in general. NAPA perceived migration from a negative perspective. It argued that climate change will lead to mass movement of people from climate affected regions to urban areas. This would increase incidence of crime in the cities. It proposed adaptation actions at local level as method to reduce the scope of migration. It states on page 36 that 'social consequences of mass scale of migration to cities would to some extent be halted' by implementing NAPA. The revised document in 2009 though did not see migration in negative way but it also could not think of migration as one of many adaptation tools. The document identified the need for assessing the extent of 'forced environmental displacement, one policy suggestion it made that the government of Bangladesh then should advocate for resettling them in developed countries who are contributing to green house gas emission. It is clear that this document has not considered livelihood migration of one or two members of the family to earn a living that would help the rest e of the family to stay at in the place of origin rather it included the forced displaces as migrants. After NAPA major climate change intervention has been taking place through Bangladesh Climate Change Strategy and Action Plan (BCCSAP). Moreover, a national strategy on Climate Induced Internal Displacement (NSCIID) is now underway. In the following a detailed discussion is made on BCCSAP, NSCIID and other coherent policy instruments.

4.2 **Bangladesh Climate Change Strategy and Action Plan (BCCSAP)**

Bangladesh Climate Change Strategy and Action Plan (BCCSAP) is a long and medium term strategic and planning instrument that formulates strategies and plan of actions to address the adverse effects of climate change. It identifies six key areas for intervention. They include food security, social protection and health, comprehensive disaster management, infrastructure, research and knowledge management, mitigation and low carbon development and capacity building and institutional strengthening' (GoB 2009, p. 3). BCCSAP mainly recognizes sea level rise, floods, tropical cylones, storm surges, drought and river bank erosion, are the major threats associated with climate change.

Likewise NAPA the major focus of BCCSAP remains on coastal belt and the climate change issues in the CHT remain absent. One of the reasons that may be attributed behind this lack of inclusion of CHT climate stresses could be 'the focus on climate extreme events rather than the long and medium term changes that took place on weather statistics such as rainfall, temperature etc.r It is expected that if temperature and rainfall variability and their impacts on climate extreme events were taken into account while developing BCCSAAP then CHT climate issues would have been covered.

On the other hand, BCCSAP discussed migration as one of the outcomes of climate change. However, the significant departure of BCCSAP from NAPA was that it refrained from linking migration and displacement of climate affected people with social problems or crime rather it treated rural urban migration from the climate hotspots as a problem of unplanned urbanisation**.** Nonetheless it did not have any policy direction on how to treat migration in the overall adaptation action plan**.** The revised 2009 BCCSAP increased the figure of potentially displaced persons from 6 -8 million to 20 million. It suggested resettlement of these people through international migration. Development of human resources in climate change-affected areas is suggested to make the population competitive in the global market. Theme four, on research and knowledge management, for the first time included the migration issue. It identified the monitoring of climate change-related internal and external migration and rehabilitation as one of its tasks. Significant knowledge gap existed in the areas of out migration pattern and behavior of people in the CHT. Therefore, the estimated 20 million figure of BCCSAP did not include migration projection from CHT.

4.3 Disaster Management Policies

Disaster management has received considerable attention in Bangladesh for much of the past two decades. The two key plans are comprehensive disaster management programme and National Plan for Disaster Management. In 2000, the GoB transitioned from response and relief to comprehensive risk reduction in collaboration with UNDP and finally the Comprehensive Disaster Management Programme (CDMP) was approved in November 2003. CDMP preceded the Hyogo Framework for Action 2005–2015. In the first phase (2004-2009) a pilot programme on long-term disaster risk reduction and climate change adaptation programme were taken in seven districts but none of them were from Chittagong hill tracts. The Phase II (2010-14) involved setting up policy and planning mechanisms that includes mapping of hazards, risks and

vulnerabilities and setting up an early warning system to protect people from the disasters of cyclones. In this regard, the key policy instruments were the National Plan for Disaster Management (2010-2015) the Disaster Management Act (2012) and the draft National Disaster Management Policy. CDMP lacks discussion on migration. It rather takes reduced scope of migration as one of indicators of successful interventions of CDMP project.

The National Plan for Disaster Management (2010-2015) aims to address comprehensive disaster risks and reduce particularly poor people's vulnerability to the impacts of natural, environmental and human-induced hazards. It emphasized on building the capacity of the Bangladesh disaster management system (Preventionweb, 2012), and instituting the culture of comprehensive risk reduction rather than focusing on conventional response and relief practices. The departure of NMDM from the traditional relief practice to poor people's vulnerability reduction was a commendable progress however; the susceptibility of CHT population to disasters was not addressed by NMDM. The NPDM maps the countrywide disparate disaster vulnerable areas which also did not include CHT. It claims that there is a nexus between poverty and disaster. It identified indebtedness and outmigration as the outcome of this nexus. Like CDMP it also assumes that disaster management interventions will reduce the scope of migration.

4.4 National Strategy on Climate Induced Internal Displacement (NSCIID)

CDMP II has recently started the process of developing a national strategy on climate induced internal displacement. The first draft of the strategy has been completed. It is currently going through a series of consultations in order to incorporate stakeholders feedback in it. The goal of the NSCIID is to set out a comprehensive and realistic right-based framework that respects, protects and ensures the rights of climate-induced internally displaced persons (CIIDPs) in different stages of displacement and during the search for durable solutions. Given this goal, the objectives of the NSCIID, therefore are to:

i. Create common and coherent basis for action plans at the national and local levels.
ii. Adopt preventive measures to minimize the internal displacement caused by climate-related disasters.
iii. Guide development of sectoral programs for the creation of conducive environments for safe, voluntary and dignified return/integration or relocation of the CIIPDs.

iv. Ensure access to entitlements; promote livelihood opportunities and overall human development of CIIDPs as part of inclusive development programs of the GoB.

The NSCIID focuses solely on internal displacements caused by climate-related disasters and not cross-border displacement issues. It covers comprehensive strategy covering all three phases of displacements – (i) pre-displacement, (ii) displacement phase and (iii) post-displacement. It on six climate/weather-related hazards that induce displacements in Bangladesh – (i) riverbank erosion, (ii) flood, (iii) water logging, (iv) salinity, (v) cyclones and storm surges, and (vi) droughts.

the NSCIID has developed a **Displacement Management Framework** (DMF) in line with IOM's migration management cycle (MMC) to identify appropriate responses/interventions during different phases of displacement. By using the DMF, the NSCIID identifies four strategic responses in this regard and they are: (i) Preventing; (ii) Preparing, (iii) Managing and (iv) Addressing.

As far as strategic responses are concerned, ***PREVENTION*** aims at stopping displacement by reducing vulnerability of the community concerned through disaster management and climate adaptation and the second strategic response is to ***PREPARE*** the vulnerable people for potential migration and/or relocation in a context when local adaptation and prevention is no longer a viable option, for instance, in the context of projected sea-level rise. The third strategic response is to ***MANAGE*** the migratory flows when displacement occurs through emergency humanitarian assistance. The fourth strategic response is to ***ADDRESS*** displacement through durable solutions – (I) return; (ii) local integration; (iii) resettlement.

However, in the context of frequent disasters and climate change, durable solutions are likely to be more complex. A combination of solutions may be necessary, including seasonal or temporary movements, including to the community of origin. Different solutions may be used by different members of a family, as when some family members return to the place of origin (permanently or on a seasonal basis), while others work in another location. Solutions must therefore be flexible, and based on free and informed consent.

In responding to displacement issues, authorities concerned must adhere to the principle of non-discrimination since it is a major barrier to displaced persons in obtaining assistance and supports. Authorities must recognize that marginalized/vulnerable groups such as women-headed households, children and elderly have special needs that must be given due attention.

Among others such groups include women-headed households, elderly, persons with disabilities, minority and indigenous people and women and children in general.

4.5 Bangladesh Overseas Employment Policy

International labour migration is an integral part of the economy of Bangladesh. In order to better govern international labour migration; in November 2006 the government of Bangladesh formulated the overseas employment policy. It is divided into six sections. The scope of this document includes rights of migrants, exploration of labour markets, and reintegration of returnee migrants, remittance transfer and management. However, no action plan was prepared to implement this policy. This document did not mention the issue of climate change at all. In 2013 the government of Bangladesh has drafted a new overseas employment policy. Nonetheless this new document also failed to reflect the realities of climate change induced migration. There is no mention of climate change migration in this document as well.

In 2013, the GoB enacted a new law named overseas employment and migrants act. This is law mostly regulatory document. It describes procedures to be followed in order to process migration by private recruiting agencies. It highlights the rights of migrants, penalties if migration procedures or rights of migrants are violated. This law is not pertinent to the discourse of climate change and migration.

4.6 Development policy and projects

After discussing climate related policies, now we will concentrate on national development policies and try to find out if climate stresses of CHT surfaced in those documents. There is no separate development policy for CHT alone. Development interventions towards CHT are incorporated in overall national development policies. There are number of development policies such as PRSP, Ten years perspective plan, and five years development policy. In the following we will concentrate on the last five year development plan which is known as the sixth five year plan.

The sixth five year development plan (2011-2015) visions to ensure social, political and economic rights; and preserve the social and cultural identity of the inhabitants of people of CHT

with a particular focus of Indigenous population. It identified some challenges that hinder the development of CHT. These are hardcore impoverishment; poor literacy, health and nutritional status; low education; high school dropout; land dispute, and inadequate food production. These challenges were seen as development impediments. However climate change stresses were not perceived as challenge when it came to CHT. The issue of climate change was only featured in the context of a forestation. It calls for climate resilient a forestation; however it did not specify how to pursue such program. It also calls for putting a ban on hill cutting to prevent deforestation. There is also a dearth of discussion on the livelihood stresses of indigenous population.

The Chittagong Hill Tracts Development Board (CHTDB) implements different development projects in the areas of education, health, agriculture, poverty reduction, capacity building and empowerment of indigenous communities. Currently CHTDB is pursuing four major development projects.

The HFDP project has started in 2008 in order to improve the socio-economic condition of 700 families through horticulture, small dairy & entrepreneurship development. The major activities under the project include the rise of 2100 acres of horticulture garden; provide basic social services like low cost housing & sanitation for 1500 families and provide technical & financial support to unemployed youths. It has a component of sustainable environment and employment opportunity.

The 2nd phase of the rehabilitation program through orange and other mixed crop cultivation started in 1999-2000. The project goal is to rehabilitate the poor and marginal farmers in suitable areas in Rangamati, Bandarban and Khargachari hill districts. It plans to develop suitable upland areas for horticulture by planting orange and other mixed crops.

Upland Settlement Project started in 2010-11. It aims to improve socio-economic condition of selected indigenous groups through initiating and intensifying horticulture and rubber garden. The activities that were planned to undertake are settling 3,300 landless or marginal farmers, to rise up horticulture in 5000 acres, to rise up rubber garden in 13200 acres. So far the project achieved a momentum to the life of 3300 landless poor families and marginal farmers, horticulture development in 6600 acres and 3 units establishment of rubber processing factories.

Integrated Community Development Project (ICDP): CHTDB has been currently implementing the third phase of ICDP. It targets to improve access, utilization and quality of basic health and social services. The Ministry of Chittagong Hill Tracts Affairs is the line agency that monitors the activities of CHTDB. Apart from the above mentioned projects undertaken by CHTDB, in FY 2012-13 the MOCHTA coordinated the implementation of the joint UNDP-CHTDF project on promotion of development and confidence building in the CHT.

None of the project took into consideration climate impacts and the growing environmental degradation into project design and activities that have been directly impacting the livelihoods of people in the CHT. For example, the impact of reduced and erratic rainfall on water sources such as chora (mountain streamlets), rain fed agriculture and Jhum cultivation. Though the hill farm development project included the component of sustainable environment but it did not detail what it implies as part of the project and how sustainable development would be achieved by implementing this project. There is no discussion on the linkage of climate change and migration in the context of CHT in the sixth five year development plan. Even the development projects also did not take into account migration in their respective project component and activities.

4.7 Impact of policies and Institutional arrangements on adaptation and migration in CHT and plain land Chittagong district

The analysis of policies showed that no policies so far took into account climate change and migration issues in the broader development spectrum of CHT. Development policies like sixth five year development plan did not identify though far climate change as a significant challenge for development and the potential of migration in reducing poverty in CHT. Similarly CHT climate change related issues and migration as one adaptation option remain outside the purview of the key climate change related plans and strategies. On top of that integrating adaptation in development strategies at the national level still did not progress well. Due to the existence of these gaps in policies the institutional arrangements in CHT e.g MOCHTA, HDCs and CHTDB could not bring the optimum benefits for people through their respective development projects.

The study found that to fight climate change very little effective planned adaptation interventions took place in CHT particularly to deal with water shortage. It directly affected indigenous people's traditional livelihood e.g Jhum and their lives e.g drinking water primarily caused by irregular rainfall. People were mostly following independent adaptation i.e turmeric cultivation and coping strategies i.e seasonal and temporary migration. Alternatively they were also practicing horticulture and high value products such as fruit, vegetables in a small scale mainly for household consumption. However, due to lack of access to input, information, credit, and market and road links to market they could not grow them in larger scale. Rasul (2015) also identified these environmental and non environmental challenges that are affecting people's lives and livelihood in CHT.

On the other hand it was found that the dearth of plans and strategies to manage internal migration, lack of focus of CHT in overseas migration policy and overall the absence of migration in key climate change plans and strategies could not transform migration in CHT as an effective livelihood strategy and adaptation tool. Internal migration though increased in the last 15 years in CHT but it remained highly disorganized, mainly occurred through social network in certain industrial zones in Dhaka and Chittagong. Migrants of CHT could only earn their subsistence in destinations because of their low level of income associated with lack of market skills, lack of information about jobs, low level of education and weak social network. Whereas migrants from plain land Chittagong district earned more because they were exposed to different skills and they had strong network in the destinations. This phenomenon was well reflected in remittance pattern of both regions where migrants of plain land Chittagong remitted 75 percent higher than the migrants of CHT.

The overseas migration had been found very low from the CHT districts. According to the BMET data (2015) three CHT districts only constituted 0.06 percent of total migration flow from the country whereas plain land Chittagong district accounted 10 percent of total migration between the period of 2005-2014. This study found that the CHT share of this low level of migration was caused by several factors including lack of information about overseas jobs, lack of migration processing agencies, limited access to finance and low level of skills. Rasul (2015) also spotted these constraining factors with regard to international migration. These realities were mirrored in the study findings. It showed that though the large share (39 percent) of financing migration in plain land Chittagong is managed by family saving however still 16 percent HHs secured their loan from banks. In CHT, HHs highlighted their lack of access to loan because of limited number

of existence of financial institutions. Besides, whereas in plain land Chittagong district around 58 percent international migration was processed by recruiting agencies there in CHT no migration was processed by RAs. Though all the CHT districts have district manpower and employment offices however, it was found that people do not know about these institutions and their functions. This finding can be further validated by the presence of lower number of migrants from these districts. In other districts of Bangladesh, NGOs has long been playing a crucial role in promoting safe overseas labour migration processes through awareness raising, information and policy advocacy campaigns. In this regard they closely work with the local communities and engage with local government functionaries and relevant agencies (Siddiqui and Mahmood, 2014). However, in case of CHT, the research teams of the study did not find so far any NGOs working on migration issues in CHT.

The Chapter III showed that the potential of migration in CHT as one of many adaptation tools to climate change also could not fully realised due to the barriers Indigenous people faced that were mentioned above. On the contrary it was found that in the plain land Chittagong people used migration as one of the adaptation options to increased river bank erosion. Migration of family members provided critical household income for many households. For example: remittance accounted 74 percent of total expenditures for STIM HHs where as for IM HH it was 59 percent. In CHT the share of internal remittance in HH expenditure was only 15 percent, however, in Rangamati it was around 109 percent and 55 percent in Khagrachari. Migration also helped families to build assets. Overseas migrant HHs in plain land Chittagong district was found with more assets than non migrant HHs. Similar experiences of migrants having more income and assets were found in the coastal areas and other climate hotspots in Bangladesh that were documented by the studies of McMillan et al. (2014) and Siddiqui and Billah (2014). These studies also captured that migrant HHs used innovative ideas in their local adaptations which were gained by their migrant family members in the destinations. This in turn helped them stay resilient against climate extreme events.

It is a fact that using migration as an adaptation option was found in most cases voluntary in nature with little support from institutions both at origin and destination locations. It is only recently when the revised NAPA and BCCSAP came up not seeing migration as a threat and the outcome of social problem rather these instruments particularly BCCSAP felt the need to rehabilitate the climate displaced people through international migration. In this context, the most important development took place through the ongoing process of adopting the NSCIID

that plans to provide adequate protection and support to internally displaced people at all three stages of displacement including pre, displacement stage and post displacement. In Bangladesh, migration as an adaptation option started receiving considerable attention in the climate change and development discourse. Research think tank like RMMRU is in the front line to surface the issue in the mainstream policies and strategies through its research led policy advocacy campaign. It is likely that climate change and migration issues as a whole and also in the context of CHT would secure considerable attention in the progressive seventh five year development plan. This could present a plenty of opportunities for transforming migration as a vital livelihood and adaptation strategies in CHT and other parts of the country. The following section provides concluding remarks as well as a series of concrete recommendations to make migration as a successful adaptation tool.

4.8 Conclusion of Chapter

The study found that Chittagong Hill Tracts region has been facing climatic and environmental hazards. These are both directly and indirectly affecting the livelihoods of people in the region and also influencing migration decision of people. However, the policy analysis found that none of the policies mentioned about those hazards, and migration in the context of CHT. The chapter also included impacts of the absence of these issues in the policies and institutional arrangements in CHT.

Chapter V
Conclusions and Recommendations

5.1 Conclusions

This study concentrated on understanding the climatic stresses of Chittagong hill tracts in comparison with adjacent plain land Chittagong district. It also attempted to understand if climate change influenced migration decision of the people of CHT. It also made a comparison of migrant and non migrant HH of the study areas to understand the potential of labour migration as one of the adaptation tools in the context of climate change. The study applied both qualitative and quantitative research method. It generated qualitative data through identification in depth interviews of Key Informants who were locally knowledgeable persons. A total of 344 interviews of migrant and non migrant households constituted the quantitative data sources.

The study found that like other parts of Bangladesh both Chittagong Hill Tracts and the plain land Chittagong have been also facing climatic and environmental hazards. The highest number of respondents identified the change in precipitation as the major climatic hazard in CHT districts. This included irregular, less rainfall, and heavy rainfall in short period. Rise of temperature was identified as the second most important change in climate experienced by the people of CHT. Deforestation is the third most environmental hazard faced by the interviewees. Deforestation was highlighted more by the respondents of Khagrachari. Landslide was identified as the fourth damaging hazard and it was experienced more by the people of Rangamati. Drought was found both in Khagrachari and Rangamati. Flood was experienced by the people of Rangamati but not Khagrachari.

The respondents of plain land Chittagong also identified precipitation change as the major climatic hazard followed by temperature rise. River bank erosion was identified as the most important environmental hazard, followed by flood. People of these three districts were facing various types of impacts of theses hazards. For CHT this included drying up of mountain streamlets, crisis of water for irrigation, drinking and other use.

Some planned adaptation initiatives were undertaken through external help to meet the water shortage caused by precipitation change such as rainwater harvesting. No external intervention was observed in the area of adaptation with regard to temperature rise. However, some autonomous adaptation practices were observed in both Khagrachari and Rangamati. In Plain

land Chittagong; people mainly coped with river erosion by moving from erosion affected areas to less affect or erosion free areas either within village or close vicinity of villages. Many of them lived over the government owned *Khas land and Chars.*

Along with other reasons, climatic and environmental hazards also threatened some of the traditional livelihoods. A section of people was practicing some of the traditional livelihoods, others however, incorporated new livelihoods at local level. In almost all the villages of Rangamati and Khagrachari district Jhum cultivation was the main livelihood for people. Irrigated agriculture was practiced only in few villages of Khagrachari. Homestead gardening, tree plantation, livestock and wood cutting in forest were other sources of livelihoods.

CHT people hardly had any experience of internal or international livelihood migration. This was changed over the years. A transformation has been taking place in these livelihoods. Jhum cultivatiotin was still practiced by a section of the population. However the nature of crop produce was changed. Instead of rice, potato, they were producing turmeric that required less water. Along with this, others were employed in reserve forests, timber trading, sell of firewood, irrigated cultivation, motor bike and other vehicle driving, running tea stalls, grocery shops, and rubber and fruit plantation. Changes in livelihoods also took place in plain land districts. River erosion led to erode agriculture land. A section of people turned to fishing, boating, petty trading shop keeping, rickshaw pulling, driving etc.

Migration was all along a livelihood strategy for a section of people from plain land Chittagong. However, traditionally experience of livelihood migration was very low from CHT. In the face of climatic and environmental hazards and other economic challenges, the practice of livelihood migration increased manifold both in CHT and plain land.

Over the last 10-15 years people of CHT also incorporated migration as one of the livelihood options. They migrated to EPZs located in Chittagong as well as to Dhaka; mostly to join the garment and other manufacturing sectors and security providing agencies. From plain land Chittagong people migrated both internally and internationally. Internally they mostly migrated to Chittagong. In case of the villages under the study in Chittagong STIM emerged as the key livelihood options for male members of the majority of the households. They mainly migrated to Gulf and other Arab countries. They mostly participated in the semi and low skilled jobs such as construction work, driving vehicle, cleaning etc as well as in the service sector related works.

There was no doubt that a section of people Rangmati, and Khagrachari took up internal migration and the people of Chittagong took up STIM as their livelihood option. However there was a major lack of understanding if climatic and environmental hazards played any role in influencing their migration decisions.

The study found that migration decisions of people of Chittagong, Khagrachari and Rangamati was influenced by economic, social, demographic, environmental and to some extent political factors. However even after facing same types of hazards some people from these areas decided to move and some other decided to stay back. Individual or household attitude towards migration, attachment with place of origin, family size of the households, availability or non availability of working age male population within the household, determined if a household would send one or two members to work and earn a livelihood outside the village. Along with individual and household characteristics access or lack of access to migration information, having or not having any known person in destination, access or lack of access to social network, ability or inability to bear the migration cost allowed some households to decide in favour of migration or some other households against migration.

A comparison of socio economic indicators of internal, STIM and non migrant HH showed that STIM migrant HH enjoyed higher income compared to the other two groups. Remittances sent by STIM of Chittagong constituted 73 percent of the HH expenditure. And for internal migrants it was 59 percent of the total HH expenditure. In all three areas HH expenditure of STIM were much higher than internal and non migrant HH.

Use of Electricity, water sealed toilet are considered as important indicators of better living condition. A comparison of internal, STIM and non migrant HHs also showed that STIM were major consumers of electricity and the use of water sealed toilet were higher among STIM HH. Tubewell and deep tubewell were the sources of almost 100% for internal and STIM and non migrant HH whereas in case of Rangamati and Khagrachari the use of tube well was less than 50 percent for all types of HHs. A comparison of asset base also indicates that STIM HH had higher asset base than internal and non migrant HH.

On the basis of above findings it can be argued that both internal and STIM can be used as one of the climate change adaptation tools along with different local level adaptation programmes.

However, the review of different climate change, migration and development policies showed that they did not consider migration as adaptation tool.

The research reviewed four types of policies-i) policies on climate change ii) disaster management policies iii) overseas migration policies iv) development policies. The review concludes that impact of climate change of CHT and linkage between migration and climate change has not been adequately addressed in the existing policy documents of Bangladesh.

5.2 Recommendations

For GoB

Our assessment of NAPA showed that climate change problems of CHT region was absent in NAPA. Although BCAS and UNDP conducted scientific study on the issues but climatic and environmental hazards of CHT were not incorporated. NAPA should be updated in the context of knowledge on climatic and environmental hazards of CHT. Upcoming projects under NAPA also should incorporate program for CHT region.

Our assessment of BCCSAP showed that the revised document discarded the negative representation of migration and called for further knowledge generation on climate change induced migration. Subsequent researches (Martin et al., 2014, Siddiqui and Billah, 2014) and the current study showed that migration may not to be treated as threat rather labour migration of a few member of family can be used as one of the many adaptation tools. All six pillars of BCCSAP should incorporate a section on evaluating the potential of migration in building adaptive capacity. Further project should be designed that provides institutional and infrastructural framework that would provide market information and services to the affected households. While continuing with programmes that target coastal areas it should also focus on CHT specific programmes.

National plan for disaster management ends in 2015. While formulating programmes for the next phase CHT problems should also be taken into consideration. New document should have programmes and resource allocation towards facilitation of labour migration both within the country and in other international labour markets.

The study demonstrated that members of CHT population migrated more internally. However their living and work conditions were not very good. Climate change funds including the climate change trust fund can be used in the urban locations for providing better living conditions. We have seen there is a policy to protect those workers who migrate internationally. However, Bangladesh is yet to develop a policy to protect those who migrate internally.

Given the fact that climate change affected people mostly migrate internally therefore it is of great importance that Bangladesh immediately develops an internal migration policy. Special attention should be given to ensure that CHT as a region is well reflected in the policy guideline on internal migration.Moreover, the adoption of the comprehensive NSCIID which is now underway, is likely to provide protection and support to internal displaces in all three stages of displacement given adequate resources are allocated and appropriate functional institutions are in place along with improved coordination between existing agencies.

This study showed that Short term Contract international migration was very low from CHT region. Government has institutional framework in place that governs short term contract international labour migration. The offices through that government conduct labour recruitment activities need to be established in all three CHT districts. These institutions include District Man Power Employment Offices (DEMOS), Technical Training Centres (TTCs), Outlet of Probashi Kalyan Bank and functions of NGOs who conduct information dissemination on migration processes. A project can be designed that will include activities of all stakeholders including government, private recruiting agencies, and potential migrants. The function of which would be to ultimately increase the opportunity of short term contract migration from CHT districts.

The Overseas Employment Policy should incorporate climate change issue. This will help use of climate change trust fund in designing and implementing special programmes on migration processing from CHT. Such action may facilitate the right path for labour migration as an adaptation tool for affected households of CHT.

The study showed that the migrants from CHT were mostly men. They had information on male labour market. Information on female internal and overseas labour market was not available in the CHT villages. Families who did not have male members were unable to benefit from internal and international migration. Special programmes need to be designed to provide such

information. For example, the Saudi Arabia labour market has been reopened recently only for female domestic workers. Women from plain land are registering with Bureau of Manpower and Employment offices to participate in Saudi Arabian female labour market. In order to encourage women from CHT region to register special campaign and services are required.

Non migrant HH identified lack of skills as one of the major reasons behind not being able to participate in the internal and international labour market. They expressed desire to be trained in skills which have demand in the market. Under the public private partnership programmes, skill development centres need to be established in CHT region.

A distinct feature of development intervention in CHT is that it has a development board. This board is implementing dozens of development projects. Climate change and labour migration can be integrated with these projects. Apart from this, this board can provide leadership in coordinating the design and implementation of climate change adaptation and migration programmes in the region.

The upcoming 7th five year plan should adequately account development stresses created by climatic and environmental hazards in CHT. Based on such analysis resource allocation to CHT development should be done. Along with programmes with local level adaptation a part of these resources should also be used in supporting infrastructure and knowledge base for enhancing short term contract international labour and internal migration to non-farm sectors from the CHT. The aim of the plan should be to establish migration as an option for people in CHT so that people who intend to migrate can be benefited from their successful migration. The plan should also delineate an integrated strategy to promote farm and nonfarm sectors in CHT so that people who wish to stay back can earn a sustainable livelihood. These should include horticulture and high value products, agro based micro enterprise, and tourism development.

A system of Inter ministerial and inter agency coordination is required to maximize programme impact in the area of adaptation to climate change in the CHT region..***For development partners***

The development partners can play a positive role in reframing those sections of BCCSAP, NAPA, DRR, documents which equated internal migration with crime or looking at migrants as welfare targets. EU and UK Aid who are major funding sources of BCCSAP may initiate

dialogues among the stakeholders for exploring scope for incorporation of voluntary migration as an adaptation tool.

Since the inception of UN Global Forum on Migration and Development (GFMD), development partners are treating migration as one of the tools for development. We think that time has come to merge GFMD's migration development paradigm with migration climate change discourse. Migration issue should be strongly placed on the "Sustainable Development Goal" agenda. Market-oriented Human Resource Development UNDP, Norad, DFID and JICA can encourage CDMP to develop training and credit programmes that support families to equip a few members to choose better livelihood opportunities through migration. SDC is well situated to bring cohesion among its assistance towards international labour migration with its CC adaptation interventions. It can encourage government to establish new skills training centres in climate stressed areas.

Development partners and research think tanks can strengthen the sharing or exchange of research findings and experiences on the role of mobility and migration for climate change resilience and adaptation, through websites, dialogues and workshops.

For CSOs

Civil society organisations play an important role in articulating demand for policy reforms. They can demand coherence among development policies, climate change policies and migration policies.

Campaigns for Protection of Rights CSOs can organise campaigns for protection of rights of internal as well as international short term contract migrants. Such campaigns may include fair wage and working hours as well as social protection issues. Incorporation of Migration Services CSOs can incorporate delivery of migration related services in their current programmes of local level adaptation. They also need to extend their services to the urban destinations of climate affected migrants.

This research is a scoping study. A robust study needs to be done in order to better understand the role of migration in building adaptive capacity of people in the context of climate change in CHT

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