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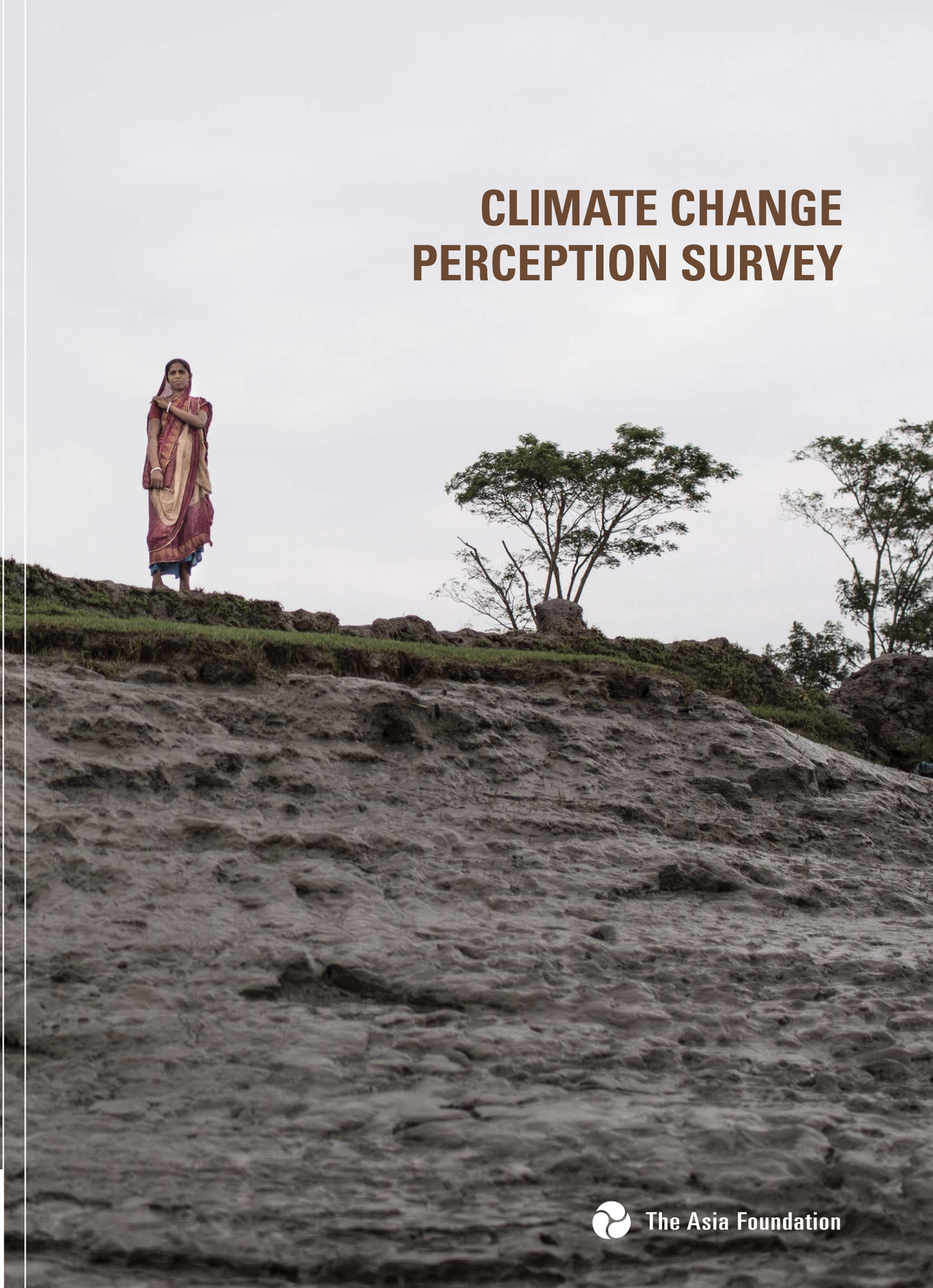
CLIMATE CHANGE PERCEPTION SURVEY



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CLIMATE CHANGE PERCEPTION SURVEY

Dhaka, Bangladesh
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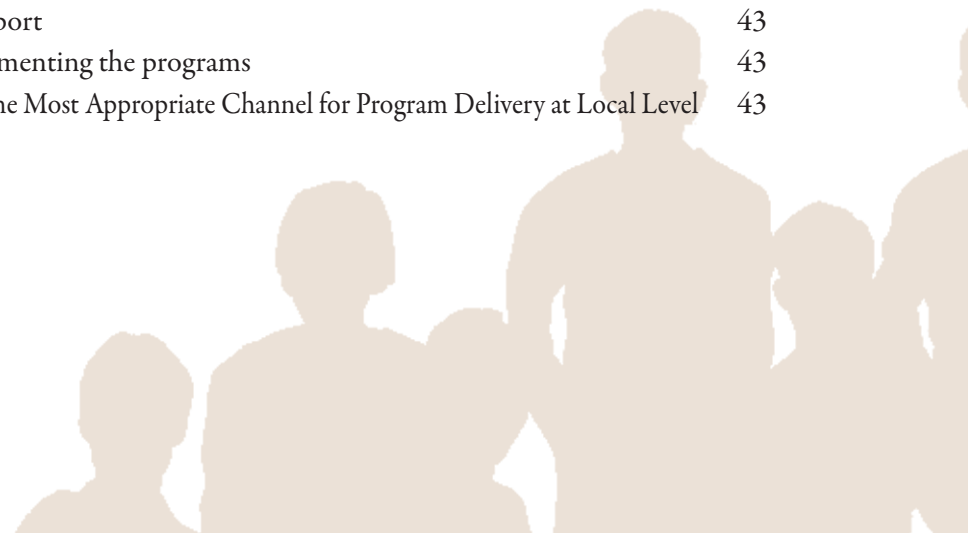

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Abbreviations

ADB	The Asian Development Bank
BCAS	Bangladesh Center for Advanced Studies
BCCRF	Bangladesh Climate Change Resilience Fund
BCCSAP	Bangladesh Climate Change Strategy Action Plan
BCCTF	Bangladesh Climate Change Trust Fund
BIDS	Bangladesh Institute of Development Studies
BUET	Bangladesh University of Engineering and Technology
BUP	Bangladesh University of Professionals
C&S	Cyclone and Salinity
CBO	Community Based Organization
CBO	Community-based Organization
CC	Climate Change
CDM	Clean Development Mechanism
CDMP	Comprehensive Disaster Management Program
CHT	Chittagong Hill Tracts
CIDA	Canadian International Development Agency
CPEIR	Climate Public Expenditure and Institutional Review
CSO	Civil Society Organization
DRR	Disaster Risk Reduction
FGD	Focus Group Discussion
GBM	Ganges-Brahmaputra-Meghna
GCC	Global Climate Change
GEF	Global Environment Facility
GHG	Greenhouse Gas
GoB	Government of Bangladesh
IPCC	Intergovernmental Panel on Climate Change
KII	Key Informant Interview
MEND	Moving towards Emission Neutral Development
NAPA	National Adaptation Program of Action
NC	National Communication
NGO	Non-government Organization
PREGA	Promotion of Renewable Energy, Energy Efficiency and Greenhouse Gas Abatement
PSU	Primary Sampling Unit
SFYP	Sixth Five Year Plan
SMRC	SAARC Meteorology Research Centre
SPCR	Strategic Program for Climate Resilience
SRDI	Soil Research Development Institute
SSN	South-South-North
TA	Technical Assistance
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change
UNO	Upazila Nirbahi Officer

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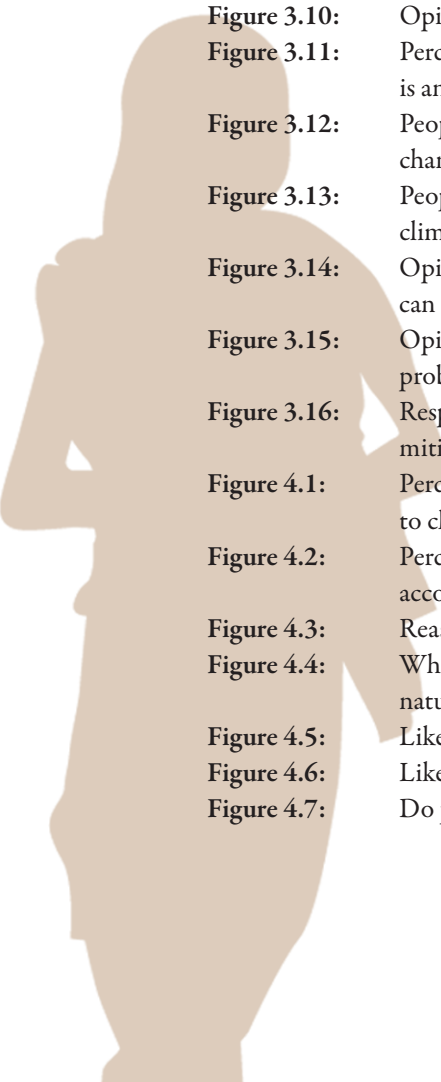
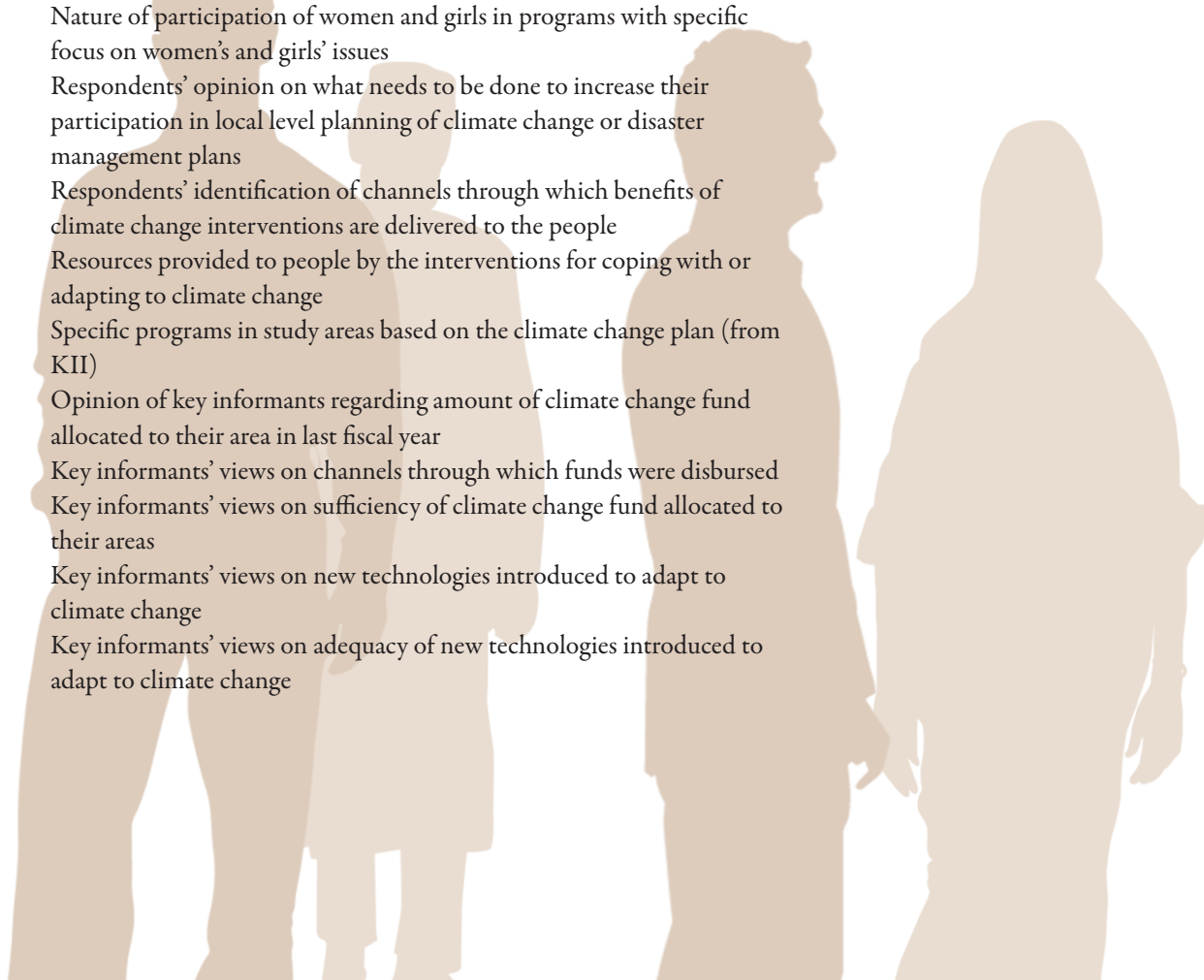




Executive Summary

A. Introduction

This study elucidates people's perception about causes and impacts of climate change, current plans and programs, and future programming needed to address climate change issues more fully. The climate change discourse has been evolving globally, and it has generated new ideas, debates and interests within the community of experts. At the same time, there has been intensification of efforts both by government and international communities to tackle climate change impacts in Bangladesh. These efforts resulted in funds, institutional mechanisms and programs.

This report is based on a national survey conducted in five hazard zones—Drought, Flood, Flash Flood, Cyclone and Salinity. Cyclone and salinity (C&S) areas were taken as one hazard zone as these two hazards are common in the coastal areas of Bangladesh. In addition Bandarban, a district in the Chittagong Hill Tracts (CHT), was included to add hilly area coverage to the study. Two districts were randomly chosen from each of the drought, flood and flash flood zones, and three from the C&S zone. With the inclusion of Bandarban district, that gives a coverage of ten districts. 261 households were surveyed from each district except Bandarban where a sample of 300 households was taken. Therefore, for the four hazard areas and CHT, the total sample size was 2,649. Out of the total sample a 50:50 male-female ratio was ensured.

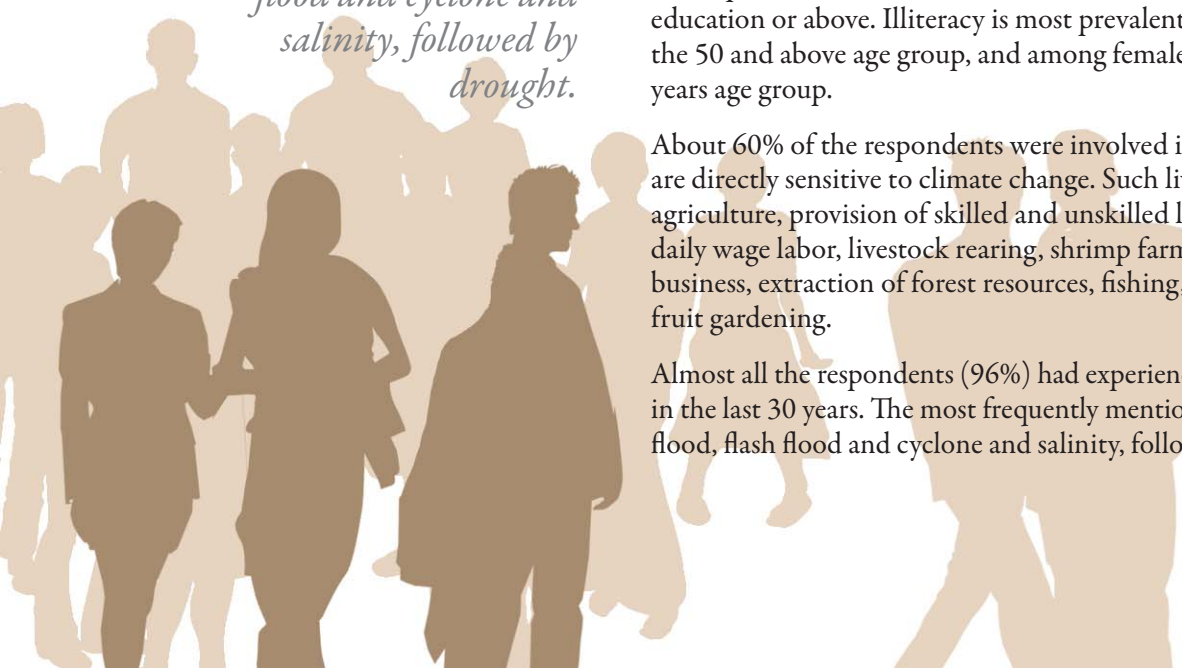
Almost all the respondents (96%) had experienced natural disasters in the last 30 years. The most frequently mentioned hazards are flood, flash flood and cyclone and salinity, followed by drought.

The study also conducted 26 FGDs to collect qualitative data from different types of respondents. Furthermore, key informant interviews were conducted with a complementary sample of stakeholders and duty bearers.

Characteristics of the study population: Average age of male and female respondents was 39.4 and 32.4 years. About 65.5% of the respondents have ever been to school, and 42% had secondary education or above. Illiteracy is most prevalent among males in the 50 and above age group, and among females in the 35-39 years age group.

About 60% of the respondents were involved in livelihoods that are directly sensitive to climate change. Such livelihoods include agriculture, provision of skilled and unskilled labor, provision of daily wage labor, livestock rearing, shrimp farming and shrimp business, extraction of forest resources, fishing, horticulture, and fruit gardening.

Almost all the respondents (96%) had experienced natural disasters in the last 30 years. The most frequently mentioned hazards are flood, flash flood and cyclone and salinity, followed by drought.



Most of the study population (92% from drought and 80% from other zones) experienced some kind of losses as a result of these hazards. The common types of losses are complete or partial destruction of homes, loss of domestic animals, loss of crops/fruits/gardens/land, loss of other income earning sources, and health hazard of family members.

B. Summary Findings

Understanding climate change: People universally stated that they have heard about the term 'climate change'. However, the perception varies among the respondents. 42% of the respondents mentioned that climate change means flood/heavy flood, 37% stated that climate change means storm/cyclone, while 22% interpreted climate change as signifying drought. It appears that people interpret the term climate change according to the particular climatic event they normally face in the areas where they live.

Climate change impact at household level: Almost 80% of the surveyed households mention loss of agricultural production, loss of trees/ gardens/houses, loss of domestic animals, loss of income, and health hazards as a result of climate change. Loss of agricultural production is reported as the top-most effect by respondents in all areas. When asked about the future likelihood of their household being affected by climate change, 38% of the respondents believed that their households are very likely to be affected.

Perception on 'causes of climate change': People appear to be largely unaware of the causes of climate change. About 46% of respondents believe that nature or God gives these changes, while 31% believe human beings are responsible for climate change. In the KIIs, however, 89% of respondents mentioned human activities as the causes, while around 66% mentioned emission from different sources including vehicles, industries, etc.

Solving climate change problems: According to half of the respondents climate change problems can be mitigated, while 27% believe not. About one-fourth of the respondents were uncertain regarding whether the problem can be solved or not. Females are inclined to be more skeptic about the possibility of solving the problem. Relating the answer to education level of the respondents, it is observed that the higher the education level, the greater the percentage of respondents that believe the problem can be mitigated, and the lower the percentage that says they do not know the answer

Among the 1,292 respondents who believe that climate change problems can be mitigated, a majority (62%) mentioned the 'government's safety net program' as the way forward. The other commonly mentioned ways included assistance from society/community, self-resilience, assistance from international donors and assistance from NGOs.

People's needs and priorities to adapt to climate change: About 80% of the respondents experienced losses due to climate change related disasters; however, 60% said they have not taken any steps to adapt to climate change. These respondents were further asked to mention the reasons for their inaction. For majority of the respondents (56%), not knowing what to do was the foremost reason. Even if people have the knowledge about what needs to be done, they do not have the money, logistics, and/or technology to implement the knowledge (25%).

About 84% of the 1,046 respondents who reported taking measures to adapt to climate change stated that their strategy was to raise the plinth of their homesteads. Other strategies were migration, floating vegetable and spice gardens, planting trees, and building pucca houses.

People were asked about what they needed to help them to mitigate the problems they faced during the last natural disaster. About three-fourths of the respondents mentioned direct cash transfers. Other needs that were mentioned include training, linkages, technology and information. Male respondents put more emphasis on training, technology and direct cash transfers than females. On the other hand, females emphasized food, housing facilities and employment generation.

Experience of migration and prospect of change of livelihoods: Migration, in various forms, was mentioned as a means to adapt to climate change. About 45% of the respondents from flash flood areas, 41% from drought areas, and 38% from CHT reported migration by one or more of their

household members. As reported by these respondents, the migration was temporary or seasonal in a majority of cases.

About 40% of the respondents said that more people are migrating in recent years. However, 64% of the respondents said that it is not at all likely that they would migrate permanently. Approximately one-tenth of the respondents reported that they are considering or very likely to migrate permanently while 26% were not sure about this.

Nearly 80% of respondents have never considered changing their livelihood due to climate change. On the other hand, 13% of the respondents had already changed their livelihoods due to climate change.

Government's plan to deal with climate change: 32% of the respondents were aware of any Government plan to deal with climate change. The people who have access to multiple channels of information are more aware (56%) of the existence of such plans. The key informant interviews revealed that 44% of the key informants knew about existence of a national level plan to deal with climate change.

Of the 877 respondents who said they know about Government's plans to deal with climate change, a large majority (75%) mentioned direct cash transfers. In addition, 37% said that government is preparing plans, formulating policies, and/or conducting research on climate change. A few respondents also have knowledge about the negotiations that Bangladesh is conducting at the international level.

Interventions in the surveyed areas to deal with climate change: When asked about their knowledge of actions of the government or Union Parishad to deal with climate change, more than half of the respondents answered positively. Only 13% of the respondents did not know about any actions.

Respondents who stated they have knowledge of Government or Union Parishad actions to deal with climate change were asked to reveal what is currently being done. Direct cash transfer was the most prevalent response (42% of respondents) about the Government's or Union Parishad's climate change initiative in different unions. Other responses include food distribution, housing support, water and sanitation facilities, and seed distribution.

Respondents' awareness of programs in the study areas: The level of knowledge of respondents about various aspects of the programs being implemented in their areas was found to be low. 55% of the respondents did not know anything about the programs.

Regarding knowledge of various aspects of the programs being implemented, 33% of the respondents were aware of the target beneficiaries of the programs, 19% of the implementers, and 11% of the program plan and amount of budget.

Access to information plays a role in determining respondent's knowledge of various aspects of the programs being implemented. For example, respondents' knowledge of target beneficiaries is correlated with their information coverage, declining with decrease of access to information. About half of the respondents with access to all the information channels and only 13% of those having no access to information are aware of the implementers of the programs in their areas.

Priority to the most vulnerable people in the study areas: People were asked whether the most vulnerable people were given priority in the programs being implemented in their areas. Opinion was almost equally divided—about half of the people said the most vulnerable groups are given priority while the other half considered they are not.

According to the respondents, corruption at different levels of government is a major factor preventing prioritization of the most vulnerable groups. By contrast, local government officials viewed lack of capacity and inadequate support as the major limitations to reach the most vulnerable people.

Existence of any plans on disaster management in the study areas: Respondents were asked about their knowledge of the climate change or disaster management plans in their Union or Upazila. 45% stated that there is no such plan for their locality. Further, 44% of the respondents did not know anything about the existence of such plan.

Nature of participation of the respondents in planning: The respondents who knew about the existence of climate change or disaster management plan in their union or upazila were further asked about their participation in plan formulation. Over 70% of the respondents who participated in any such planning, reported their participation consisted of attending meetings. But only a quarter of the respondents asserted that they provided opinions in the planning process.

Women and girls' participation in the interventions: Only 10% of the respondents mentioned the existence of any intervention on climate change with specific focus on women and girls. Of the respondents who knew about any women and/or girl specific intervention, 45% said that the women and girls participated only as beneficiaries, while 36% said women and girls participated only in the training sessions.

Ways to increase people's participation: Respondents who were aware of any climate change or disaster management plans in their union or upazila but either have not participated or ineffectively participated in their planning were asked about what is needed to increase their participation in local planning. About half of the respondents were of the view that valuing their opinion will increase their participation. Over 40% mentioned advance information will increase participation.

C. Conclusions and Recommendations

The evolving climate change discourse is yet to reach the common people who live with the problem. Gaps in understanding exist between the institutional actors and the impacted population. Whatever the level of understanding about the causes of climate change, people have already started to experience the adverse impacts. While household level initiatives are under way, people think that their capacity to adapt to the changes is inadequate. The study population also has clear views about their preference regarding what support they need, and the channels and means by which that support could be provided.

The study puts forward the following policy recommendations:

- Build uniformity of views among local and national stakeholders for climate change policies and actions.
- Invest in capacity building for the vulnerable population (including women and girls) both in terms of designing adaptation measures as well as enhancing their knowledge and understanding of policies and politics of climate change.
- Enhance 'political efforts' to address the existing governance challenges in the service delivery systems to ensure that the most vulnerable people may get their fair share of the national and international resources that are available to deal with climate change.

chapter 1

"The climate change discourse has been evolving globally, and it has generated new ideas, debates and interests within the community of experts. At the same time, there has been intensification of efforts both by government and international communities to tackle the climate change impacts in Bangladesh."

1 Introduction

1.1 Background

Bangladesh's vulnerability to climate change is now universally acknowledged. In the last 30 years, the country has experienced nearly 200 climate-related disasters including drought, extreme temperature, floods, and storms. These events have killed thousands of people, destroyed homes and livelihoods, and cost approximately $16 billion in damages (Oxfam International, 2011). Further, climate forecasts predict additional uncertainty and extreme events. For Bangladesh, two primary funding commitments have emerged in response to adverse impact of climate change- 1) the Bangladesh Climate Change Trust Fund (BCCTF) and 2) the Bangladesh Climate Change Resilience Fund (BCCRF). Both funds will support implementation of the Bangladesh Climate Change Strategy Action Plan (BCCSAP). Several institutional donors have also prioritized climate change in their strategies for Bangladesh and are likely to contribute additional funds. The governance mechanism for all these strategies, policies, plans and funds is going to be a major concern. Responsibility, accountability and transparency of key stakeholders, as well as the extent of participation of affected stakeholders will be among the key issues.

Local government plays an important role in coordinating community needs and priorities with higher level government policy and funding. However, little attention has been given to its role in climate governance[1], and it is

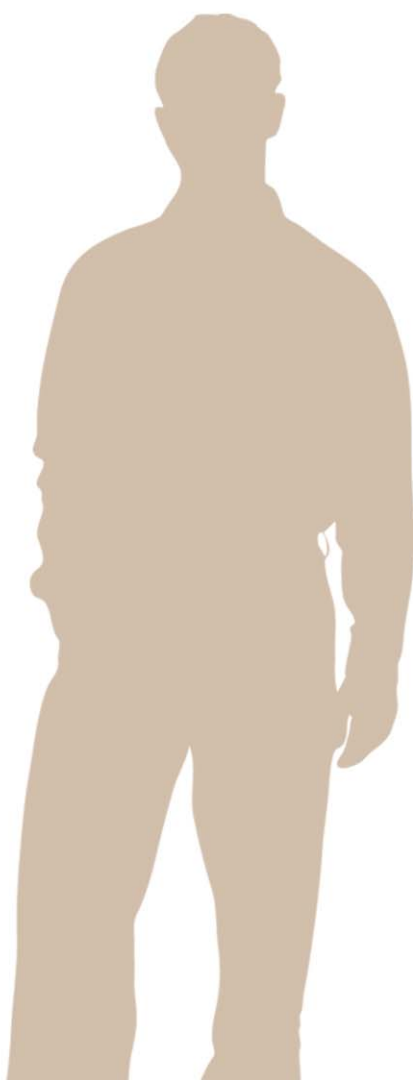
1 *Here climate governance covers the aspects of transparency, accountability, responsibility and participation in the funding and implementation of climate change initiatives. The institutional focus is on the central and local government, NGOs and other civil society organizations, and development partners / donors.*

therefore uncertain whether responsible, transparent, accountable, integrated, and participatory support for climate change adaptation will reach the most vulnerable communities. In this context, it is critical to understand the perceptions of the most affected, vulnerable, and at-risk people of the impact of climate change in their lives and livelihoods, and the results they experience from various climate change adaptation and mitigation interventions by government (local and national), non-governmental organizations, and community-based organizations.

Surveys of affected communities conducted at different intervals of time can capture people's perceptions of climate change and climate governance as well as changes in those perceptions. This understanding can provide a perspective on the impact that the significant amount of climate change funding is having on local communities. In Bangladesh to date, such initiatives have been very limited. One study, published in European Journal of Economics, Finance and Administrative Sciences, was based on a survey of 300 people in Dhaka city to explore urban citizens' perception on climate change (Rahman, Haque, & Khan, 2011). The study indicates that urban people are only experiencing some changing climatic patterns, but are not facing serious effects due to climate change. However, the study is based only on urban area and, moreover, did not target disaster induced migrants.

"The current study is based on a nation-wide survey on climate change perceptions. The study elucidates people's perceptions about causes and impacts of climate change, current plans and programs and future programming needs to address climate change issues more fully.

The climate change discourse has been evolving globally, and it has generated new ideas, debates and interests within the community of experts. At the same time, there has been intensification of efforts both by government and international communities to tackle the climate change impacts in Bangladesh. The efforts resulted in funds, institutional mechanisms and programs. Still a knowledge gap exists on how these have influenced the perceptions of people affected by climate change. This study aims to address that gap.



1.2 Objectives of the Study

The goal of the study was to gather and analyze the perceptions of communities in Bangladesh regarding their vulnerability to climate change, the interventions being taken to address these vulnerabilities, and future priorities for action.

The specific objectives of the study was: To conduct an in-depth survey of communities at risk from or affected by climate change, as well as other relevant stakeholders about (a) the impact of climate change on their daily lives, with special attention to the impact on livelihoods and economic activities; (b) awareness and perception of what needs to be done and what is being done[2] to address those; and (c) governance[3] and results of the resources and interventions.

1.3 Methodology

The study adopted a mix of quantitative and qualitative methods and tools. A nationally representative quantitative survey was administered and a set of qualitative methods were also applied to obtain a full understanding of people's perceptions.

The survey adopted a multi-stage stratified random sampling technique with households as the contact points for the respondents.

1.3.1 Selection of Geographic Areas

The country was divided into five hazard zones (adopted from Comprehensive Disaster Management Program funded by UNDP)—areas affected by drought, flood, flash flood, cyclone and salinity—in order to understand the diverse perceptions of people in different hazard contexts. Cyclone and salinity (C&S) areas were taken as one hazard zone as these two hazards are common in the coastal areas of Bangladesh. In addition, Bandarban district from the Chittagong Hill Tracts (CHT) was included to have the perceptions of the people of the hill tracts regions.

The districts falling in each zone were listed and two districts were randomly selected from each of the drought, riverine and flash flood zones.[4] Moreover, three districts were randomly selected from the C&S zone. The 10 selected districts were:

District	Hazard Zone
Chapai Nawabganj and Naogaon	Drought
Shariatpur and Kurigram	Riverine flood
Sunamganj and Chittagong City Corporation	Flash flood zone
Satkhira, Cox's Bazaar and Patuakhali	Cyclone and salinity
Bandarban	CHT

In each zone, municipal wards in district towns and in city corporations were considered as urban geographic units. Villages under selected unions were considered as rural units.

1.3.2 Quantitative Method and Sampling

The survey conducted face-to-face interviews using structured questionnaires. The questionnaire was pre-tested. The respondents were:

2 *By the government (central and local), NGOs and Community Based Organizations (and other Civil Society Organizations), and development partners / donors in Bangladesh.*

3 *Here climate governance covers the aspects of transparency, accountability, responsibility and participation in the funding and implementation of climate change initiatives.*

4 *Chittagong City Corporation falling in the flash flood zone was purposively chosen.*

- Household members: Adult persons aged18 years and above; and
- Local and central government representatives, political party members, professionals, staff of NGOs and other CSOs.

1.3.3 Sample Size Calculation for Household Survey

For each district, a sample size of 261 was deemed sufficient to yield significant estimates of parameters of concern for each hazard area. In Bandarban district, a sample of 300 was taken. Overall, the total sample size was 2,649 for the four hazard zones and CHT (Table-1.1). . A 50:50 male-female ratio was maintained.

Table 1.1: Sample distribution

Hazard zone	Drought	Flood	Flash Flood	Cyclone and Salinity	CHT	Total Sample
Total Sample	522	522	522	783	300	2,649

From each selected district, both urban and rural areas were considered. For urban coverage, district town/'sadar upazila' headquarter was considered as the study area. For rural coverage, any upazila other than the 'sadar upazila' was considered.

Urban sampling:

- The sadar upazila was considered as the survey area. From each sadar upazila, two municipal wards were selected at random to serve as Primary Sampling Units (PSU).
- Each selected ward was virtually divided into blocks such that each block contains around 50 households.
- Two blocks were selected from each ward and required numbers of households were visited maintaining a standard house-gap.

Rural sampling:

- Other than the sadar upazilas, all other upazilas were considered for rural sampling. One upazila was randomly selected for the rural coverage.
- From each selected upazila, 2 unions were selected randomly.
- From each selected union, 2 villages were selected randomly to serve as Primary Sampling Units (PSU).
- Each selected village was assessed for their number of population. The PSUs were then virtually divided into blocks such that each block contains around 100 households.
- One block was then selected randomly in each village and the required number of households was visited maintaining a standard house-gap.

1.3.4 Sample Size for Key Informant Interview (KII)

To conduct the Key Informant Survey, a complementary sample of stakeholders and duty bearers was included. 320 government and non-government stakeholders were contacted in the 20 selected upazilas as respondents for the KII. Based on their availability, only 294 respondents could actually be interviewed. The types of respondents for KII are specified in Table 1.2.

Table 1.2: Type of respondents for the KII survey for each upazila

Type of respondent	Specification
Local government representatives	
Union Parishad/Municipal Ward	Chairman/ Ward Councilor
	Member/official of Ward Council
	Female member/official of Ward Council
Upazila/Municipality	Upazila Chairman/Pauro Mayor
	Upazila Nirbahi Officer (UNO)
Local government departments	Agriculture
	Food and disaster
	Fisheries
	Livestock
	Water
	Education
Other stakeholders	Political parties (majority vote receiving parties)
	NGO workers
	Community based organization (CBO) workers
	Professional associations (teachers, press, other associations, farmer's clubs)
	Private business (chambers of commerce, agri-related business, fishing related business etc.)

1.3.5 Qualitative Method and Participant Selection

Focus Group Discussions (FGDs) and Case Studies were used as qualitative tools.

Focus Group Discussions

FGDs using semi-structured guidelines were carried out with different groups of pre-selected respondents of homogenous categories. The guidelines were prepared for each group of respondents. Each group consisted of 7-8 participants. Participants for FGDs were selected based on their availability and willingness to participate. The categories of FGD participants are shown in Table 1.3.

Case Studies

Ten case studies (two per zone) were carried out at the household level through in-depth interviews, observations, and discussions. Cases were identified during the household surveys and FGDs.

Table 1.3: Sampling distribution for FGD

Participants for FGDs	Drought	Flood	Flash Flood	Cyclone and Salinity	CHT	Total
Farmers – landless	1	2	1	1	1	6
Fishing communities	1	1	2	1	0	5
Day laborers	1	1	2	2	1	7
Women	1	1	0	1	0	3
Ethnic communities	-	-	-	-	-	3
People dependent on forest resources	-	-	-	-	-	2

1.4 Report Structure

The report contains six chapters. The first chapter describes the background and research methodology. The second chapter deals with the current climate change context in Bangladesh. This chapter also includes the profile of the respondents from the quantitative survey. The third chapter presents the existing knowledge and understanding of people about climate change. Chapter Four discusses the impact of climate change on the lives and livelihoods of the study population. The fifth chapter presents the views of the survey population about climate change polices, plans and programs. The last chapter presents a set of conclusions and recommendations.

chapter 2

Salinity is already changing the poverty map of Bangladesh making salinity hit districts a new poverty pocket (Daily Star 2011). According to Bangladesh Soil Salinity Report (SRDI 2009) prepared by Soil Research Development Institute (SRDI), there has been a 22% increase in salinity-affected agricultural land since 1973.

2 Context – Climate Change and Bangladesh

2.1 Vulnerability of Bangladesh

Bangladesh is already experiencing climate change as predicted and observed by the scientific community. Although average number of people killed and affected by disaster has fallen over time, the fact remains that more than 50 million people have been affected every five years from 1986 to 2007. The nation spent around USD 10 billion over the last thirty years in the management of disasters (BCCSAP 2008). The country's physical location together with widespread poverty makes it particularly vulnerable to climate change. The agriculture sector, the key employment provider for Bangladesh, is badly hit by climate change. Historical inequalities based on gender, age and income continue to determine people's vulnerability to climate change.

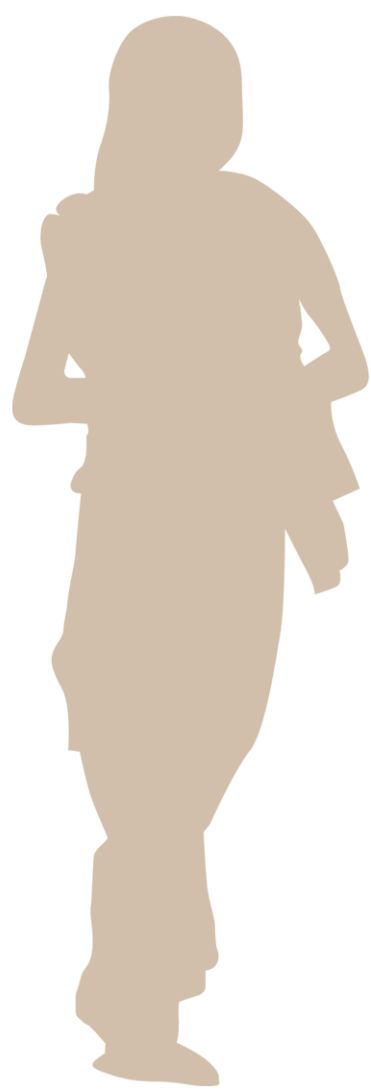
Climate change is now among the key drivers that perpetuate poverty. The Intergovernmental Panel on Climate Change (IPCC) places South Asia and the Coastal Region of Bay of Bengal among the regions most vulnerable to climate change in the world. Cyclone frequency during November and May over the North Indian Ocean has increased two-fold in the last 122 years (Singh, Khan, and Rahman, 2000). Bangladesh and India already top UNDP's list of countries exposed to high cyclonic mortality risks—75.5% in Bangladesh and 10.8% in India (United Nations, 2009). The projected sea level rise could flood the homes of millions of people living in the low-lying areas of South Asia.. Salinity is already changing the poverty map of Bangladesh making salinity hit districts a new poverty pocket (Daily Star 2011). According to Bangladesh Soil Salinity Report (SRDI 2009) prepared by Soil Research Development Institute (SRDI), there has been a 22% increase in salinity-affected agricultural land since 1973.

2.2 Institutional Response: Discourse, Policies and Strategies

There has been a shift in the national discourse on climate change (CC). First, the discourse started with a skeptical view that 'another international agenda' demanding highest political attention has been added to broad-based development concerns. Second, although concerns about CC originated within the environmental circle, these are now widely accepted as development issues. A third dimension can be characterized as a 'nationalist agenda' based on the principle of climate justice, especially popularized by the campaign and CSO groups and now widely shared by Government of Bangladesh (GoB).

Studies now confirm that climate change will impact on all aspects of Bangladesh's development and will be a major hindrance for the country's efforts to become a middle income country by 2020 (Alam 2011). This concern resulted in a significant change in the policy and institutional landscape in Bangladesh, especially over the last 10 years. Considering trans-national issues, the country is at the center of global climate change discussions, and plays an important role in international climate change politics and diplomacy. The context arguably shaped by three major disasters[5] in 2007 triggered an intensification of effort to tackle climate change. Three major initiatives emerged as a result: (i) Climate Change Strategy and Action Plan (BCCSAP), (ii) two financing mechanisms—Bangladesh Climate Change Trust Fund (BCCTF), funded by Government of Bangladesh (GoB) and backed by an Act passed in Parliament; and a donor funded Bangladesh Climate Change Resilience Fund (BCCRF, formerly Multi Donor Trust Fund); and (iii) a climate change institutional mechanism. New institutions within government, political system[6], non-government, research and academic institutions, and NGO networks have emerged, and campaigns have been established.

Bangladesh developed a National Adaptation Program for Action (NAPA) in 2005. Although Bangladesh formulated the NAPA in 2005, process and content of BCCSAP is significantly different in nature and scope. While NAPA considered only urgent and immediate priorities of adaptation, the BCCSAP included all four pillars of Bali Roadmap—mitigation, adaptation, financing and technology transfer.



5 *Two national scale floods in July and a super cyclone called Sidr in November 2007.*

6 *All party parliamentary committee; Parliamentary committee of coastal MPs.*

The BCCSAP outlines six key pillars under which Bangladesh will undertake climate change activities in the period from 2009-2013:

1. Food security, social protection, and health
2. Comprehensive disaster management
3. Infrastructure
4. Research and knowledge management
5. Mitigation and low carbon development
6. Capacity building and institutional strengthening

The BCCSAP emphasizes on building climate resilient development with added focus on poor and vulnerable, including women and children. In recent years, efforts are underway to mainstream climate change into the national planning process. The country's Sixth Five Year Plan (SFYP) includes a chapter on Environment, Climate Change, and Disaster Management. In addition, the Planning Commission of Bangladesh has recently undertaken an extensive analysis of climate change finance issues in the country in the form of the Climate Public Expenditure and Institutional Review (CPEIR), the first draft of which has been released.

Besides the two climate change funds (BCCTF and BCCRF), additional climate finance is being provided through the Strategic Program for Climate Resilience (SPCR). A Comprehensive Disaster Management Program (CDMP) was launched in 2005, and its second phase is now underway. Moreover, using their innovation and program scaling-up capacity, Bangladesh NGOs, working throughput the country, initiated pilot programs to face climate change problems.

2.3 Characteristics of the Study Population

2.3.1 Demography and education

Average age of the male respondents was 39.4 years while the female respondents were younger with average age of 32.4 years. About 66% of the respondents have ever been to school, and 42% had secondary education or above (Figure 2.1). Illiteracy is most prevalent among males in the 50 and above age group, and among females in the 35-39 years age group. Further details are presented in Annexure Table 7.1.

2.3.2 Livelihoods of the study population

About 60% of the respondents are involved in livelihoods that are directly sensitive to climate change (Figure 2.2). Such livelihoods include agriculture, provision of skilled and unskilled labor, provision of daily wage labor, livestock rearing, shrimp farming, extraction of forest resources, fishing, horticulture, and fruit gardening (Annexure Table 7.2).

Figure 2.1: Level of education of respondents

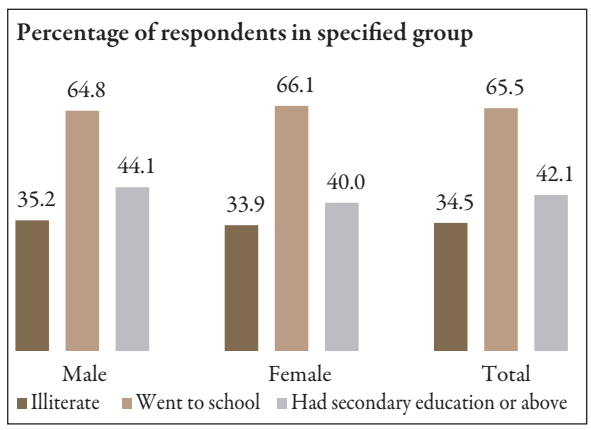
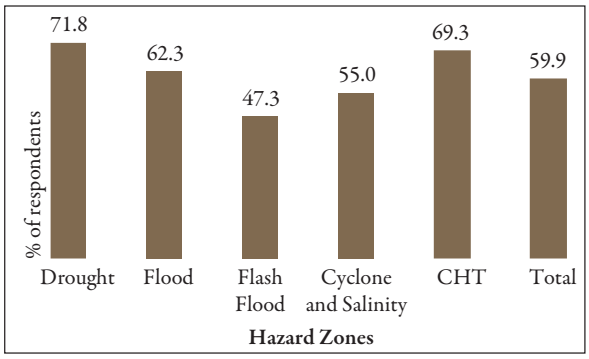


Figure 2.2: Percentage of respondents involved in livelihoods directly sensitive to climate change



2.4 Experience of Living with Natural Disasters

Almost all the respondents (96%) had experienced natural disasters in the last 30 years. During this period, they encountered an average of 3.3 disaster events of various levels of intensity. The most frequently mentioned hazards are flood, flash flood and cyclone and salinity (97%), followed by drought (94%).

About 82% of the study population experienced some kind of losses as a result of these hazards (Figure 2.3). The common types of losses are shown in Figure 2.4. However, there are regional variations as presented in Annexure Table 7.3.

Figure 2.3: Percentage of respondents reporting losses during last natural disaster they faced

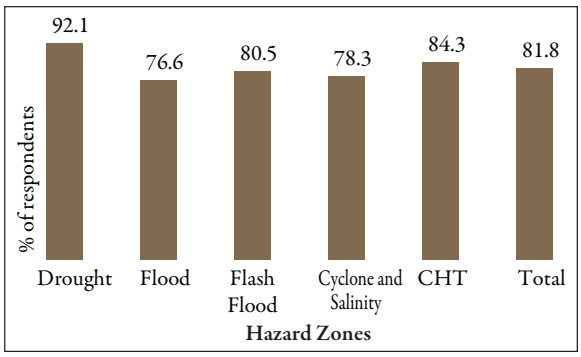
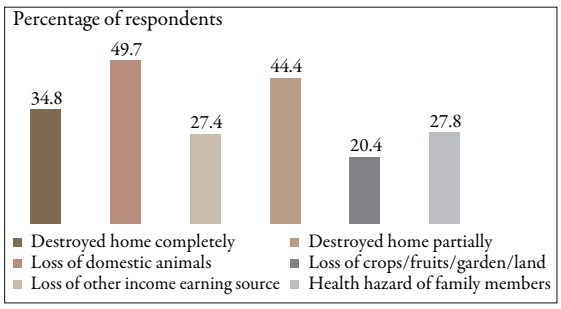


Figure 2.4: Percentage distribution of respondents by type of losses during last natural disaste encountered



chapter 3

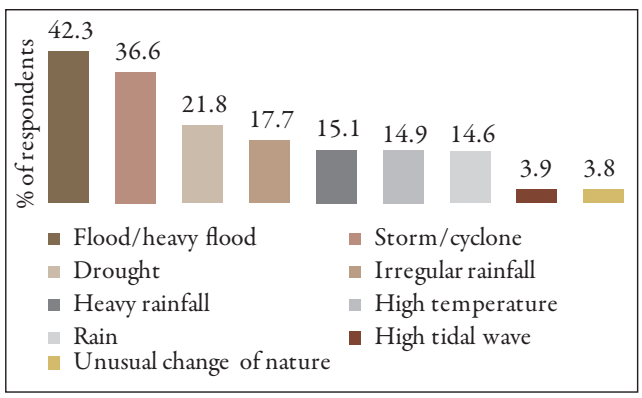
"Almost all the respondents said that they had observed climate change in the previous 10-30 years. Regarding intensity, 57% of the respondents believed that the impact was "a great deal"

3 People's Knowledge of Climate Change

3.1 Understanding Climate Change: It's Meaning and Causes

Most of the surveyed population has heard about the term "climate change". However, when asked what they understand by the term, the respondents gave varied responses. Forty two percent of the respondents stated that climate change means flood/heavy flood, 37% stated that it means storm/cyclone, while 22% interpreted climate change as signifying drought (Figure 3.1).

Figure 3.1: What respondents mean by the term "Climate Change"



It appears that people interpret the term climate change according to the particular climatic event they normally face in the areas where they live. For example, over 50% of respondents in flood and cyclone and salinity (C&S) areas and only 20% in drought areas interpret climate change as meaning floods

or heavy floods. Also, approximately 50% of respondents in drought areas say that climate change means drought, whereas only 14% in C&S areas and 5% in CHT think so. Table 3.1 shows a distribution of respondents by zones and some major interpretations of climate change.

Table 3.1: Respondents' Interpretation of what climate change means (by hazard zones)

	Drought	Flood	Flash Flood	Cyclone and Salinity	CHT	Total
Flood/heavy flood	19.3	55.7	37.9	53.6	37.0	42.3
Storm/cyclone	51.7	40.2	27.4	36.8	19.7	36.6
Drought	48.9	21.6	16.1	13.9	5.3	21.8
Irregular rainfall	37.5	15.3	14.8	11.4	9.3	17.7
Heavy rainfall	25.5	10.9	12.3	13.9	12.0	15.1
High temperature	12.1	13.4	26.6	10.7	13.0	14.9
Rain	24.9	12.1	6.7	16.3	10.7	14.6

In the KII survey, around one fourth of the key informants stated that climate change means seasonal change. Approximately another one-fourth said that climate change means temperature increase.

3.2 Severity of the Change in Vulnerable Communities

Almost all the respondents said that they had observed climate change in the previous 10-30 years. Regarding intensity, 57% of the respondents believed that the impact was "a great deal" (Figure 3.2). This perception was stronger in flash flood, drought and CHT areas. On the other hand, people from flood and C&S zones considered the impact of climate change as only moderate or little in the areas where they live.

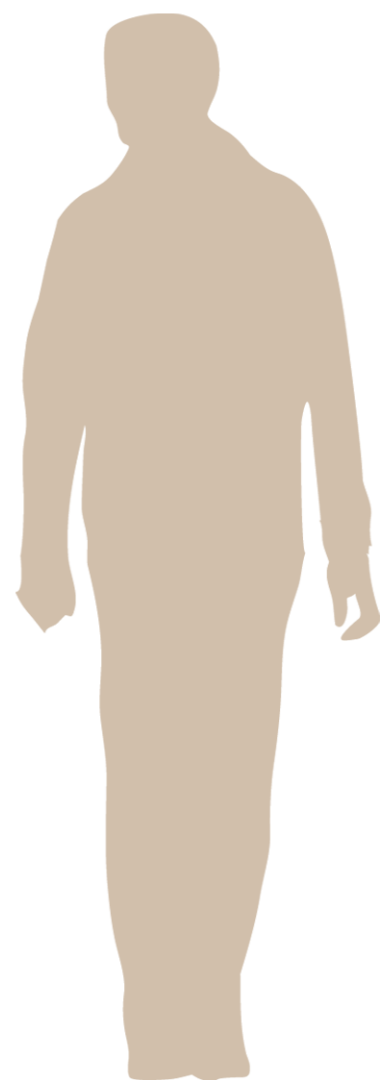
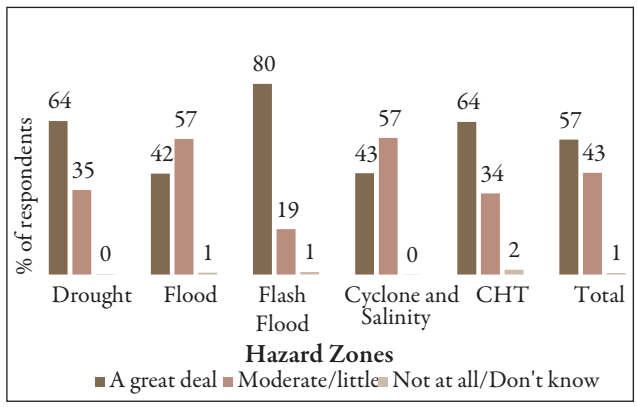
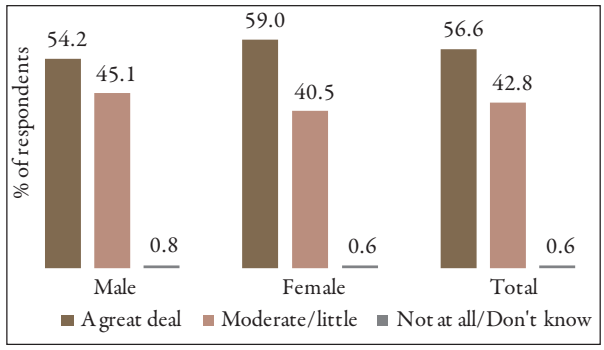


Figure 3.2: Opinion on impact of climate change in the study areas (by hazard zone)



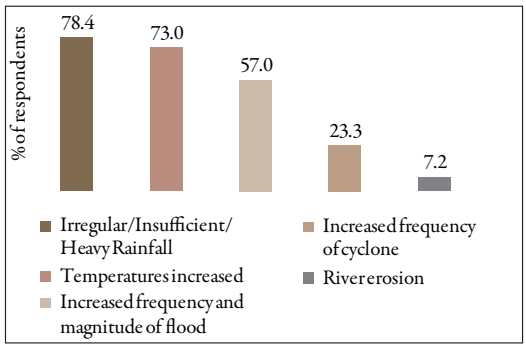
Perceptions regarding the impact of climate change varied among respondents who engage in climate sensitive livelihoods compared to those whose livelihoods were not sensitive. For instance, 58% of the respondents whose livelihoods are directly affected by climate change mentioned that the impact would be great in their areas; a similar assertion was made by 54% of those who are engaged in livelihoods insensitive to climate change. Gender differences in perception are also observed—59% of female respondents as opposed to 54% of male respondents consider that the impact of climate change has been a great deal in their areas (Figure 3.3).

Figure 3.3: Opinion on impact of climate change in the study areas (by gender)



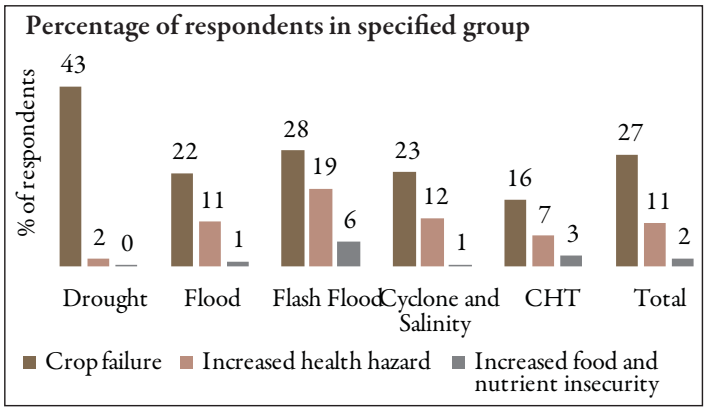
People experienced a great deal of change in the weather e.g. irregular, insufficient or heavy rainfall (78%) and temperature increase (73%) over the last 10-30 years (Figure 3.4; details in Annexure Table 7.4). However, a clear variation was evident in different zones. For example, irregular/insufficient/heavy rainfall was mentioned by over 80% of respondents in drought, flood, and C&S areas, but by 74% in CHT areas and only 54% in flash flood areas. About 93% of people in drought areas mentioned increased temperature while only 41% mentioned this in CHT areas. Overall, 57% of the respondents observed increased frequency and magnitude of flood—over 70% in C&S and CHT areas and only 16% in drought areas.

Figure 3.4: Percentage distribution of respondents according to the observed weather change pattern over the last 10-30 years



People have already experienced various deleterious effects of climate change. The more frequently mentioned effects include crop failure, increased health hazard, and increased food and nutrient insecurity (Figure 3.5).

Figure 3.5: Distribution of respondents according to their reported results of weather change pattern over the last 10-30 years



3.3 Climate Change Impact at Household Level

Almost 80% of the surveyed households reported being affected by climate change (Figure 3.6). There is some regional variation in this statistic, from 70 to 80 percent in flood, flash flood, and cyclone and salinity zones to over 80% in CHT, and over 90% in drought areas. Those affected principally mention loss of agricultural production, loss of trees/gardens/houses, loss of domestic animals, loss of income, and health hazards (Figure 3.7). Large regional variations are observed—agricultural production losses are reported by 48% of respondents in cyclone and salinity (C&S) areas and by 63% in drought areas; loss of tress/gardens/houses by 15% in drought areas and 46% in C&S areas; loss of income by 25% in flood areas and 35% in drought areas; and health hazards by 15% in CHT and 38% in flash flood areas. Loss of agricultural production is reported as the top-most effect by respondents in all areas. The second major effect in drought areas is loss of income (35%); in flood and flash flood areas—health hazards (37%); and in C&S and CHT areas loss of trees/gardens/houses (Annexure Table 7.5).

Figure 3.6: Households affected by climate change in different hazard zones

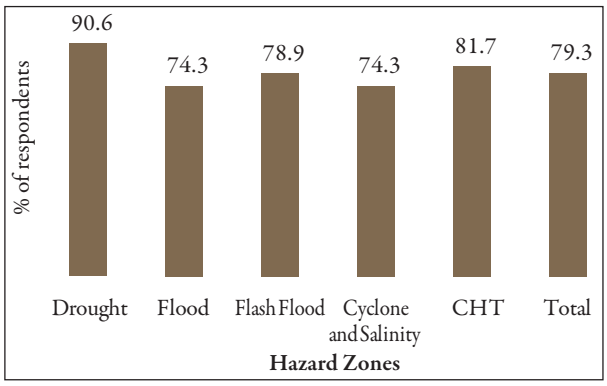
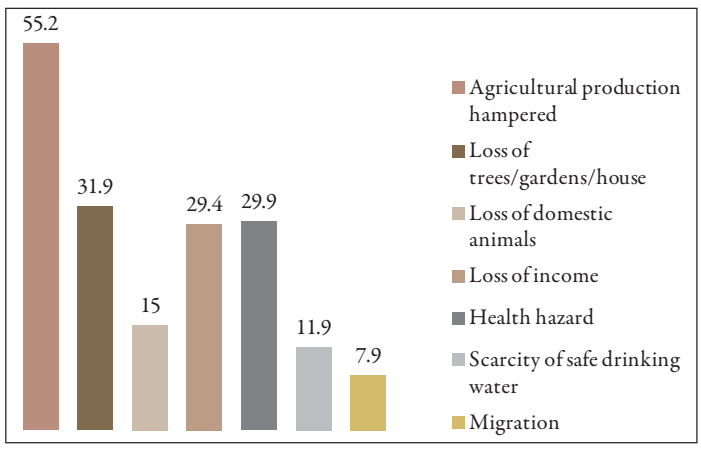


Figure 3.7: Effects at the household level suffered by households affected by climate change



Specific localized effects are also mentioned by respondents. For example, respondents in Lama Pouroshova in Bandarban district (CHT zone) mention river filling caused by hill-slides every year. They identify many problems associated with hill-slides. First, people who are living at the bottom of a hill get buried under the soil during a hill-slide. Moreover, people who practice Jumia farming (a kind of slash and burn agriculture) face problems in doing that every year, and are forced to cultivate with a three years gap.

"We have faced a severe flood 3 months ago and are affected badly. It has damaged our paddy, other crops and fishes in the pond. Our paddy goes under the soil due to landslide." – Farmer, Lama Pouroshava

Today we are here....but tomorrow we don't know where we will be...

Ambia Begum (not real name), age 27, lives in Kurigram. She introduced herself as a landless and homeless woman. Her husband is a day laborer. They lost their land and house due to river erosion. They shifted their homestead several times and now they are likely to become homeless. Now they live on a char-land under a mortgage for 10,000 Taka each year.

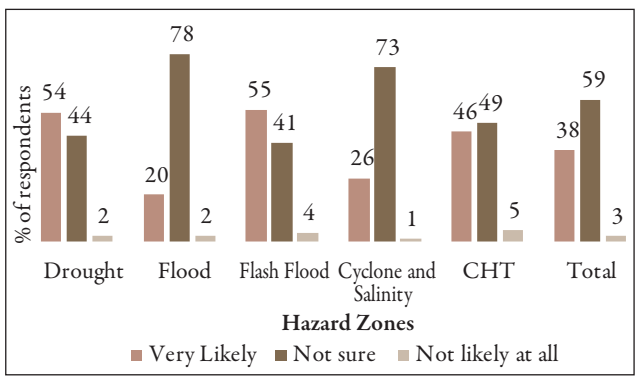
She said, *"We can consume food only if my husband can earn. During flood, we face very big trouble as there is no work during that time. My husband just stays at home and we pass our days with scarcely any food."*

She added, *"We don't know whether we can stay here for long. River erosion can take us away anytime. Today we are living here, but we don't know where we will be tomorrow."*

In FGDs, participants mostly mentioned reduction of agricultural production due to climate change. Most of them are affected directly or indirectly by climate change. Often it becomes tough for them to overcome loss of assets due to poverty. They also believe that climate change has long-term impacts on their lives and livelihoods that hinder their efforts to come out of poverty.

When asked about the likelihood of their household being affected by climate change, 38% of the respondents believed that their households are very likely to be affected (Figure 3.8). Over half the respondents in drought and flash flood areas consider it very likely that their households would be affected; however, in flood and C&S areas, over 70% of respondents said they are not sure. Opinion is roughly divided in CHT region regarding "very likely" and "not sure".

Figure 3.8: Percentage distribution of respondents according to their perceived likelihood of their households being affected by climate change



3.4 Perception on 'Causes of Climate Change'

While the study population in general is familiar with the term 'climate change', people appear to be largely unaware of its causes. About 46% of respondents believe that nature or God gives these changes (Figure 3.9). This was mentioned by 64% of respondents from drought zones, approximately 60% from CHT and 50% from C&S areas. In the KIIs, however, 89% of respondents mentioned human activities as the causes, while around 66% mentioned emission from different sources including vehicles, industries, etc. (Figure 3.10).

Figure 3.9: Opinion of respondents on main causes of weather change

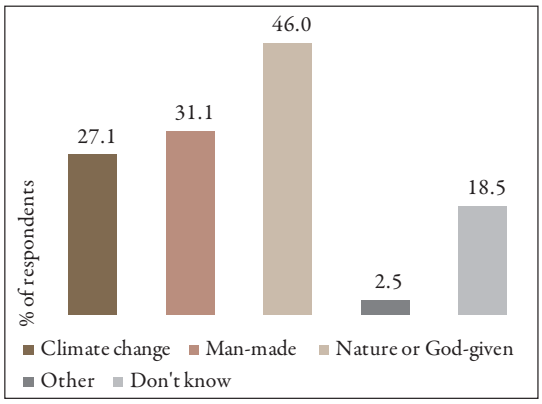
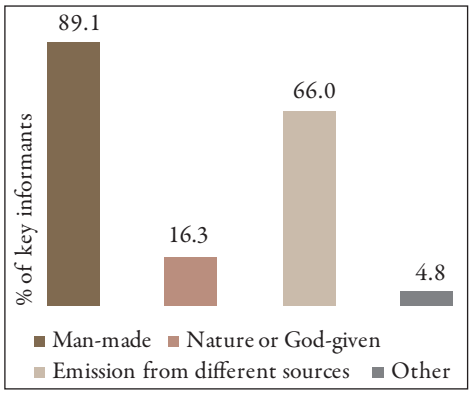


Figure 3.10: Opinion of key informants on main causes of climate change

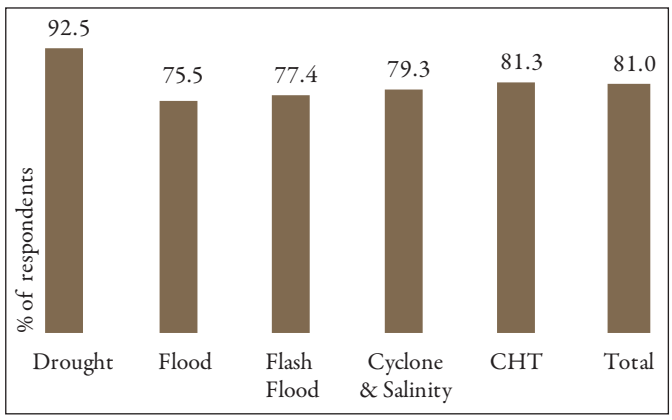


Human activities were also mentioned as factors exacerbating the impact of climate change. A majority of the FGD participants observed that Bangladesh is affected by more floods in recent years. A number of them talked about the 'river training' activities in neighboring countries as responsible for frequent floods and drought in Bangladesh. In Kurigram (north-west part of Bangladesh) and Sunamganj (north-east) people mentioned the barrages in India as causes of floods in Bangladesh.

"India has made a dam in the border area. Due to that water cannot come into our country."- Farmer, Kurigram

Respondents were also asked if they thought there was anybody responsible for climate change. 2,146 respondents (81% of all respondents) replied in the affirmative. This percentage varied amongst the different hazard zones, as shown in Figure 3.11.

Figure 3.11: Percentage of respondents who said "Yes" to the question whether there is anybody responsible for climate change



The respondents who said "Yes" to the question whether there is anybody responsible for climate change were asked to give their opinion on who is responsible for climate change in Bangladesh. 60% of these respondents stated 'God' is responsible. This perception was upheld more by females than by males (Figure 3.12). In terms of hazard zones, the perception that God is responsible was upheld by 75% of respondents from drought areas, 66% from flood areas, and about 60% from C&S and CHT areas (Figure 3.13). About half of the respondents (47%) blamed mankind for climate change. This perception was found more among people from flash flood, C&S and CHT areas. However, little more than one-tenth of the respondents also made 'government' (14%) and 'rich countries' (12%) responsible.

Figure 3.12: People's perceptions (by gender) about who is responsible for climate change

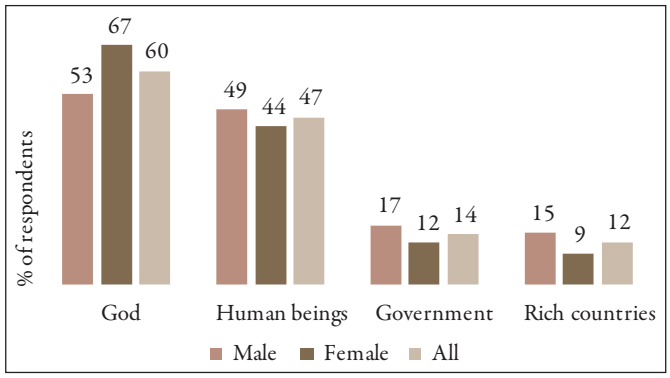
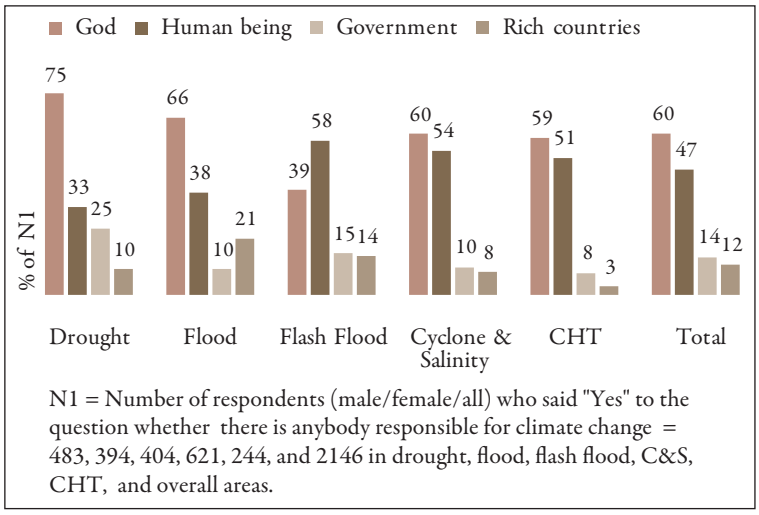


Figure 3.13: People's perceptions (by hazard zone) about who is responsible for climate change



N1 = Number of respondents (male/female/all) who said "Yes" to the question whether there is anybody responsible for climate change = 483, 394, 404, 621, 244, and 2146 in drought, flood, flash flood, C&S, CHT, and overall areas.

3.5 Understanding Responsibilities: Who Will Solve Climate Change Problems

According to half of the respondents climate change problems can be mitigated, while 27% believe not (Figure 3.14). However, around one-fourth of the respondents were uncertain or unaware of whether the problem can be solved or not. Females are inclined to be more skeptic about the possibility of solving the problem—35% of females compared to 18% of males believe the problem cannot be solved. 26% of the male respondents (compared to 13% of the females) mentioned that they did not know if the problem could be solved.

Relating the answer to education level of the respondents, it is observed that the higher the education level, the greater the percentage of respondents that believe the problem can be mitigated, and the lower the percentage that says they do not know the answer (Figure 3.15).

Figure 3.14: Opinion of respondents (by gender) whether climate change problems can be mitigated

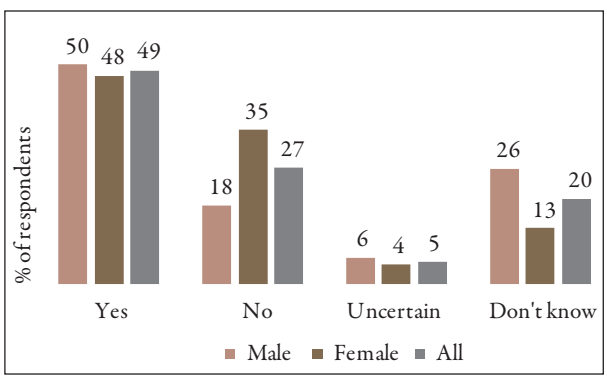
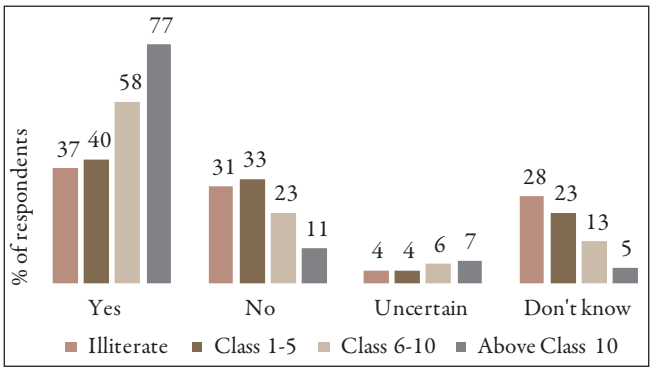
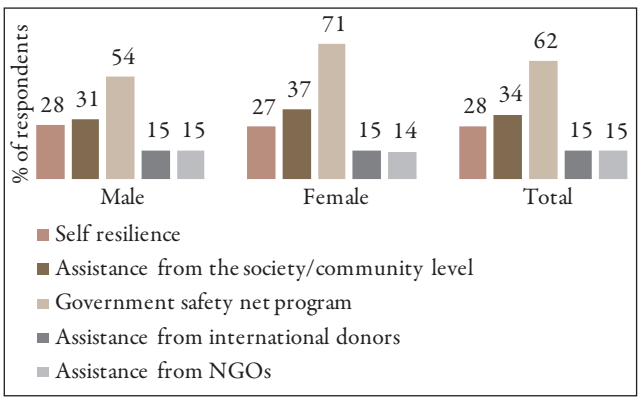


Figure 3.15: Opinion of respondents (by education level) whether climate change problems can be mitigated



Among the 1,292 respondents who believe that climate change problems can be mitigated, a majority (62%) mentioned the 'government's safety net program' as the way forward (Figure 3.16; details in Annexure Table 7.6). 71% of female respondents as opposed to 54% of male respondents uphold this view. According to these respondents, the other commonly mentioned ways included assistance from society/community, self-resilience, assistance from international donors and assistance from NGOs.

Figure 3.16: Respondents' opinions on how climate change problems can be mitigated



chapter 4

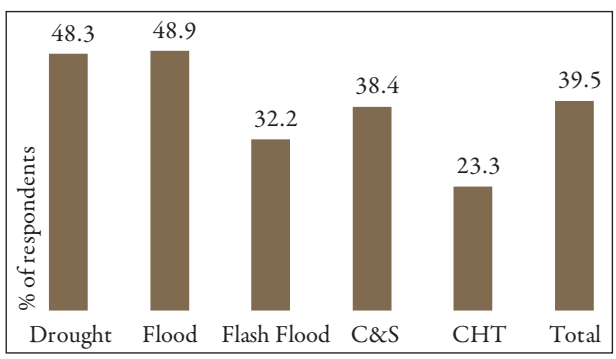
"Although 82% people in CHT experienced losses due to climate change, adaptation measures were taken up by only a small proportion of these people."

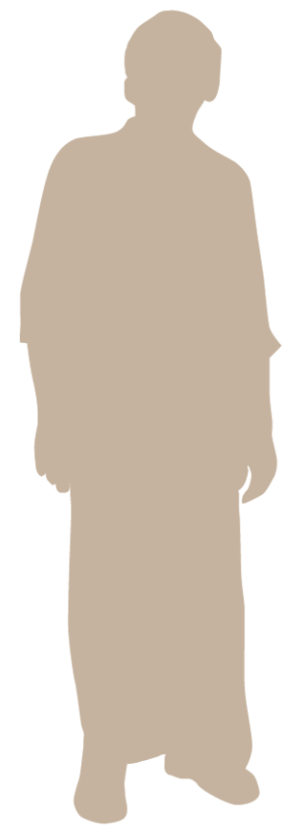
4 Adapting to Climate Change: people's needs and priorities

4.1 People's Actions to Adapt to Climate Change

About 40% of the respondents reported taking some measures to adapt to climate change (Figure 4.1). This percentage varied across the study areas. While higher proportion of the respondents from drought (48%) and flood zones (49%) reported some actions, much lower proportion from CHT (23%) reported the same. Although 82% people in CHT experienced losses due to climate change, adaptation measures were taken up by only a small proportion of these people. More than half of the people from CHT area stated that they did not get anything from the Government or Union Parishad to deal with climate change effects (see Annexure Table 7.7).

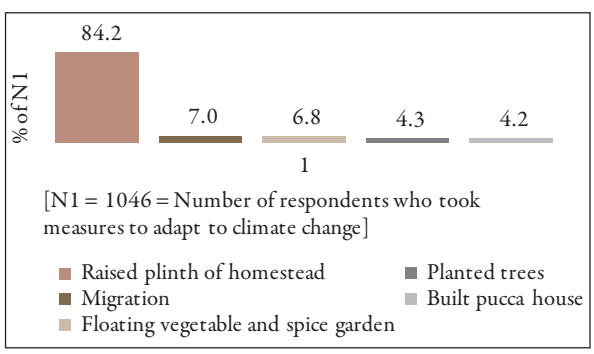
Figure 4.1: Percentage of respondents who reported taking some measures to adapt to climate change





No significant variation was found in the adaptation strategies among the vulnerable communities. About 84% of the 1,046 respondents who reported taking measures to adapt to climate change stated that their adaptation strategy was to raise the plinth of their homesteads (Figure 4.2; details in Annexure Table 7.8). This was the most widely reported strategy in all the areas. Other strategies adopted were migration, floating vegetable and spice gardens, planting trees, and building pucca houses. Around 14% of the respondents from flood zones mentioned vegetable and spice cultivation in floating gardens.

Figure 4.2: Percentage distribution of respondents (who took adaptation measures) according to the reported actions they took



The 1,603 respondents (61%) who have not done anything to adapt to climate change were further asked about the reasons for their inaction (Figure 4.3; Annexure Table 7.9). For majority of these respondents (56%), not knowing what to do was the foremost reason. Also, 25% of the respondents said that even if people knew what to do, they do not have the money, logistics, and/or technology to implement the knowledge.

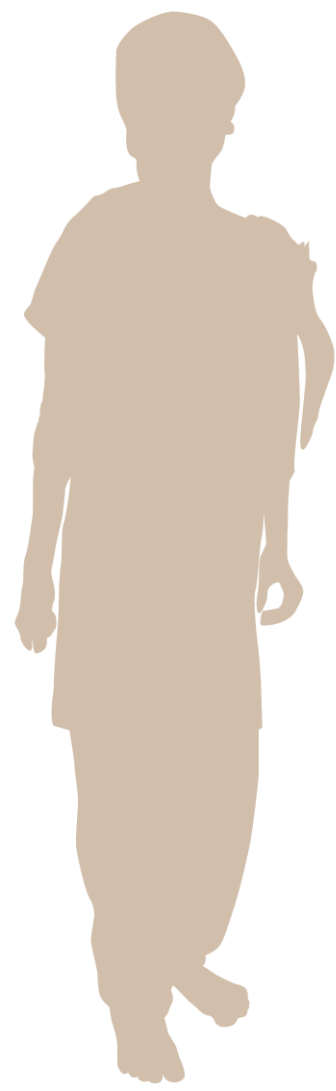
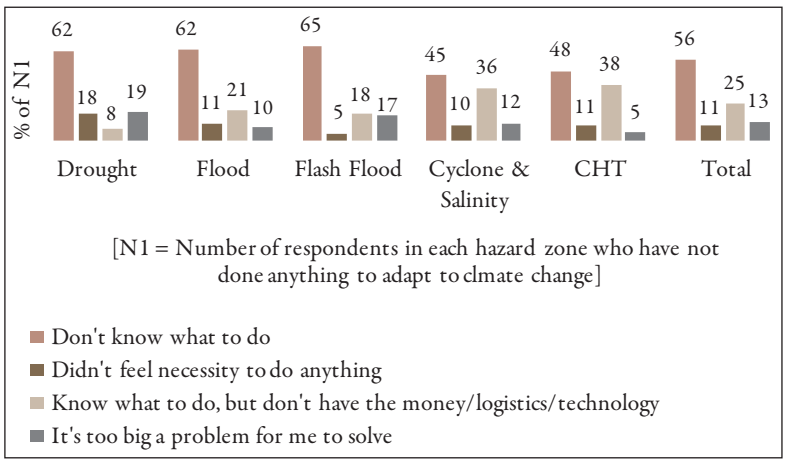


Figure 4.3: Reasons for not doing anything to adapt to climate change



Poverty often impedes the disaster preparedness though people know what to do. According to their opinion, people get prepared based on their financial conditions and availability of materials.

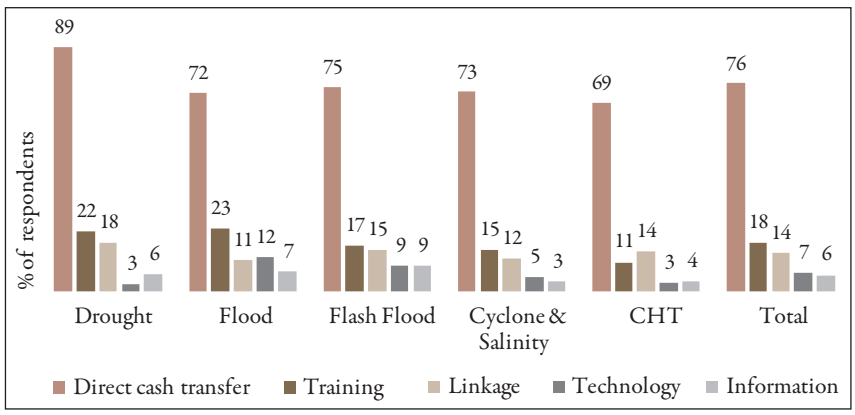
> *"We may store food for 1 to 2 days only; we don't have financial ability to store for more days."* - *Day laborer, CTG Metro*

People seek support from the responsible authorities and often they tend to implement the lessons learned from different sources. Many respondents opined that they have planted trees which can protect them from some natural disasters.

> *"I heard that if there are more trees then it will help to have regular rainfall. That's why we should plant big trees."* – Farmers, Kurigram

People were asked about what they needed in order to mitigate the problems they faced during the last natural disaster. A large majority of the respondents mentioned direct cash transfers (76%). In drought areas, 89% of respondents stated the need for direct cash transfers. Other needs that were mentioned include training, linkages, technology and information (Figure 4.4). Male respondents put more emphasis on training, technology and direct cash transfer than females. On the other hand, females emphasized food, housing facilities and employment generation.

Figure 4.4: What people needed to mitigate the problems they faced during the last natural disaster



A mixed scenario has been found from the FGDs about disaster preparedness. Sometimes people rely on the mercy of God who they believe has given the disasters. Those people think that there is no way to stop natural disasters. Moreover, respondents had expressed that sometimes disaster strikes very rapidly and people have no chance to get prepared.

"What would we do then, we only run to save our lives, what else??" – Day laborer, Sunamganj

"We were not able to do something for minimizing flash flood. We can't afford any preparedness measures as we are yet to recover from the last disaster. We don't think that climate change problem can be solved." –Farmers, Lama Pouroshava

4.2 Experience of Migration

Migration, in various forms, was mentioned as a means to adapt to climate change. About 45% of the respondents from flash flood areas, 41% from drought areas, and 38% from CHT reported migration by any of the household members. As reported by respondents who have experienced migration by any of their household members, the migration was temporary or seasonal in a majority of cases.

About 40% of the respondents said that more people are migrating in recent years. However, when the respondents were asked about their likelihood of migrating permanently, 64% replied that it is not at all likely (Figure 4.5). About one-tenth of the respondents reported that they are considering or very likely to migrate permanently while one-fourth of the respondents were not sure about this. Uncertainty about their permanent migration was mostly found among the respondents from areas exposed to drought.

When looked at from the gender aspect, 67% of males as opposed to 61% of females considered the possibility of permanent migration as not at all likely (Figure 4.6). Uncertainty regarding the likelihood of permanent migration was higher among female than among male respondents.

Figure 4.5: Likelihood of permanent migration, by hazard zones

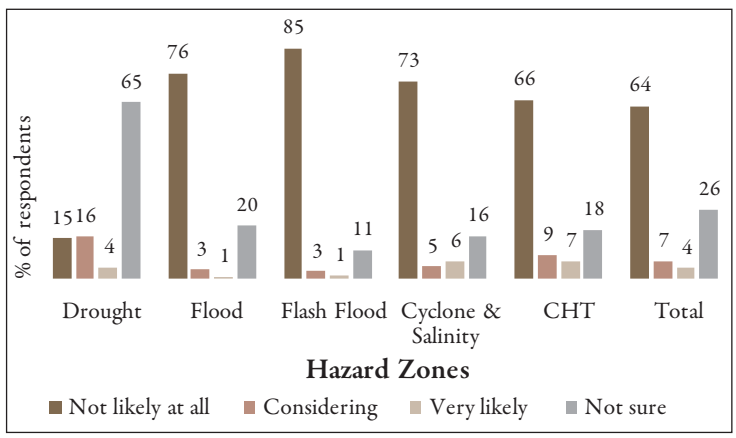
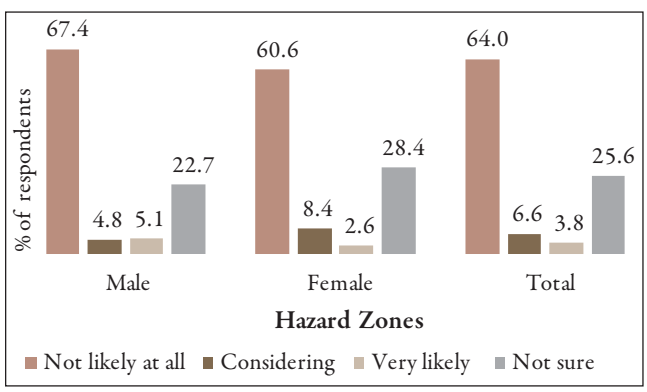


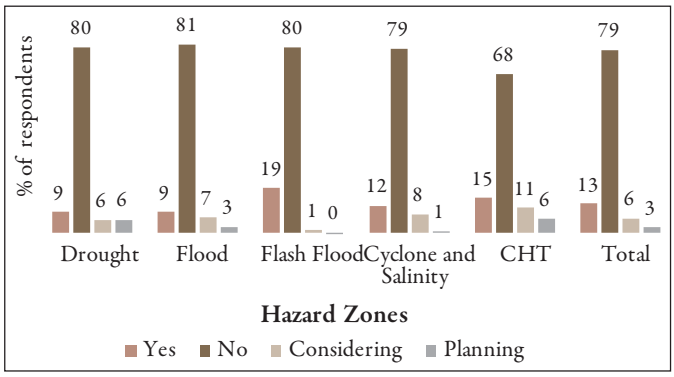
Figure 4.6: Likelihood of permanent migration, by gender



4.3 Prospect of Change of Livelihoods Due to Climate Change

The respondents were asked if they have thought about changing their livelihoods due to climate change. Nearly 80% of respondents have never considered changing their livelihood (Figure 4.7). On the other hand, 13% of the respondents had already changed their livelihoods due to climate change. This proportion was higher in the areas affected by flash flood (19%) compared to other areas.

Figure 4.7: Do people change their livelihoods due to climate change?



chapter 5

"In the key informant interviews, it was observed that 44% of the key informants knew about existence of a national level plan to deal with climate change (Figure 5.3)."

5 Climate Change Policy and Action

5.1 Government's Plan to Deal with Climate Change

Overall, 32% of the respondents reported being aware of any Government plan to deal with climate change (Figure 5.1). The people who have access to multiple channels of information are more aware (56%) of the existence of such plans (see Annexure Table 7.10). However, there is a gender difference in such awareness. While 36% of female respondents are aware of any plan, only 28% of males are (Figure 5.2). In the key informant interviews, it was observed that 44% of the key informants knew about existence of a national level plan to deal with climate change (Figure 5.3).

Figure 5.1: Respondents' awareness of Government's plans to deal with climate change, by hazard zones

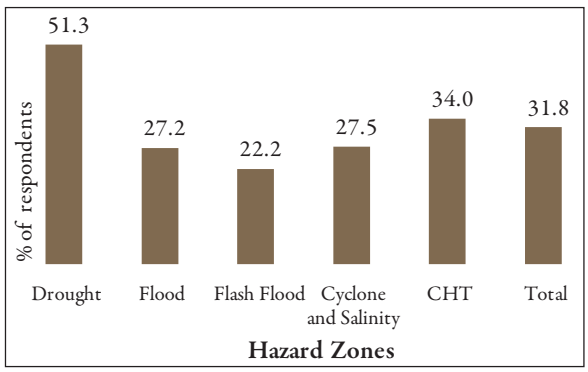


Figure 5.2: Respondents' awareness of Government's plans to deal with climate change, by gender

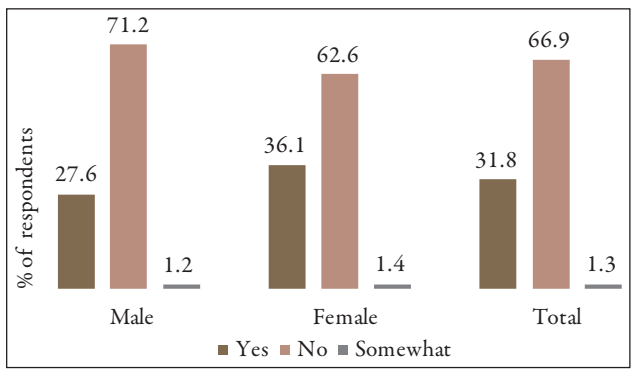
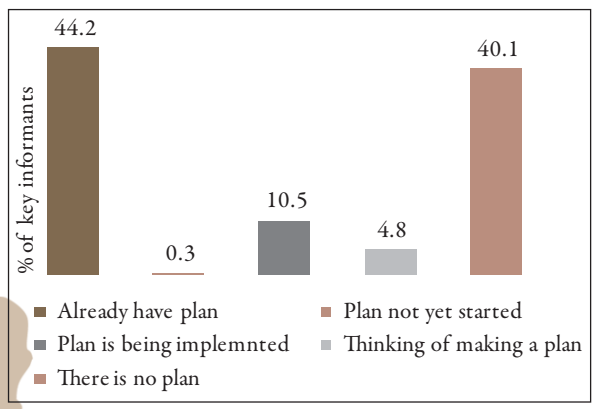
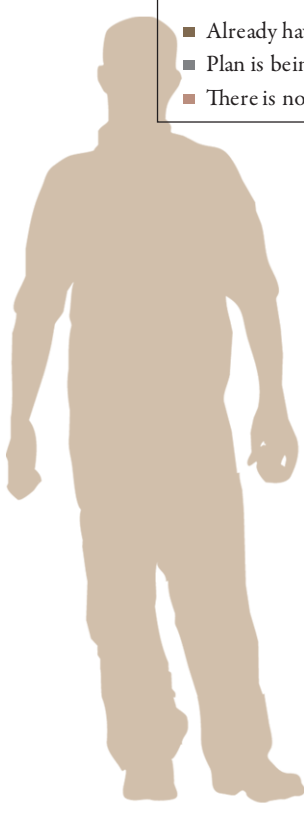
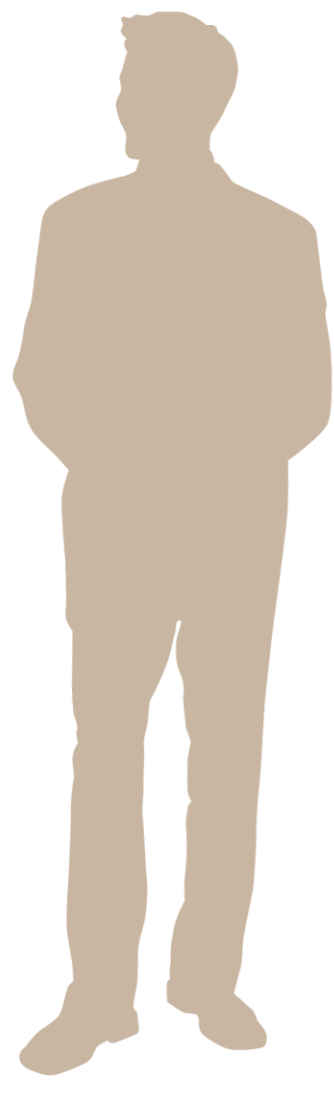


Figure 5.3: Awareness of key informants of existence of any specific Government plan to deal with climate change

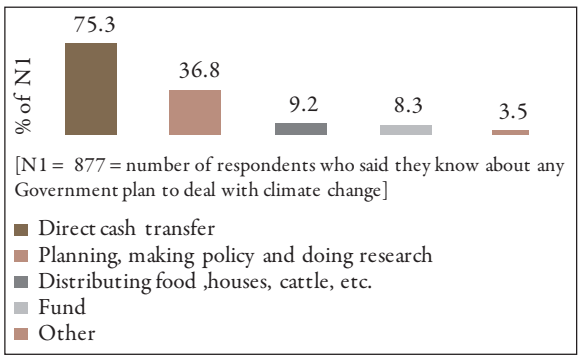






Of the 877 respondents who said they know about Government's plans to deal with climate change, a large majority (75%) mentioned direct cash transfers (Figure 5.4). In addition, 37% said that government is preparing plans, formulating policies, and/or conducting research on climate change. A few respondents also have knowledge about the negotiations that Bangladesh is doing at the international level (See details in Annexure Table 7.11).

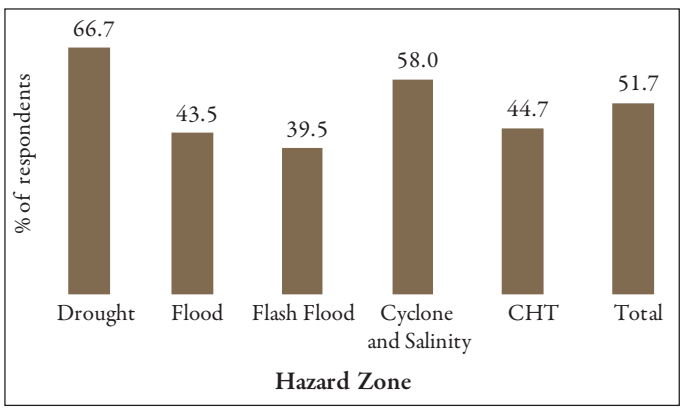
Figure 5.4: People's knowledge of governmental plans to deal with climate change



5.2 Interventions to Deal with Climate Change

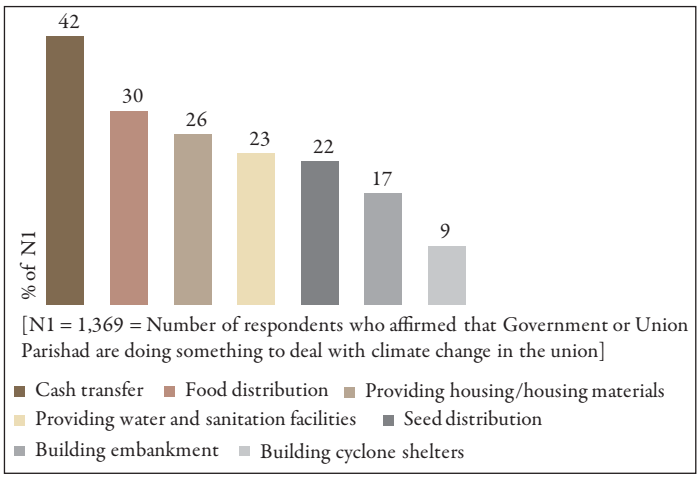
The respondents were asked if there was anything being done by the central Government or Union Parishad (local government) to deal with climate change. More than half of the respondents answered positively (Figure-5.5). In the drought and C&S areas, 67% and 58% of the respondents knew about the plans of the Government or local government.

Figure 5.5: Percentage of respondents who have knowledge of Government or Union Parishad actions to deal with climate change



Respondents who stated they have knowledge of Government or Union Parishad actions to deal with climate change were asked to reveal what is currently being done. Direct cash transfer was the most prevalent response (42% of respondents) about the Government's or Union Parishad's climate change initiative in different unions (Figure 5.6; details in Annexure Table 7.12). Other responses include food distribution, housing support, water and sanitation facilities, and seed distribution.

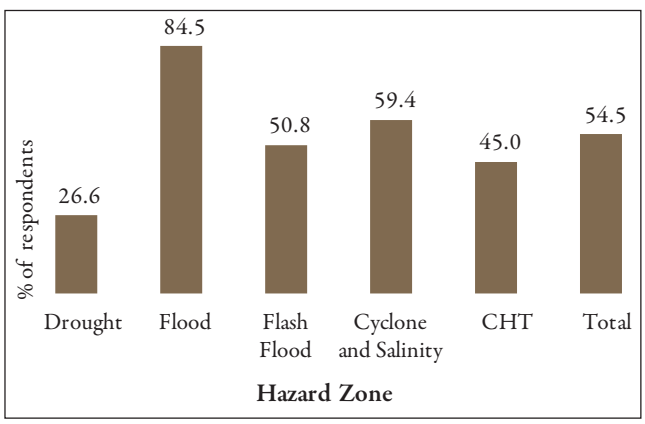
Figure 5.6: Government or Union Parishad actions to deal with climate change



5.3 Respondents' Awareness of Programs

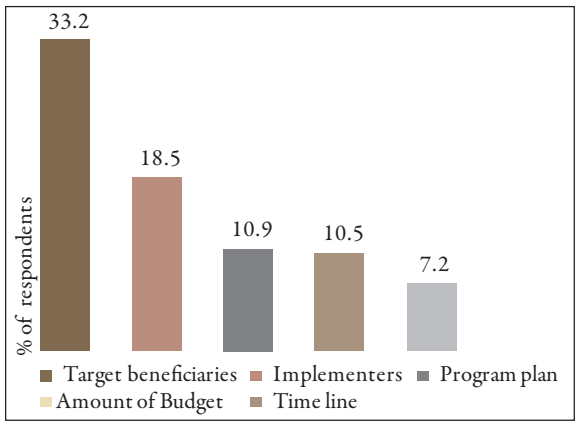
The level of knowledge of respondents about various aspects of the programs being implemented in the study areas was found to be low. Overall, 55% of the respondents did not know anything about the programs (Figure 5.7).

Figure 5.7: Percentage of respondents who do not know anything about the programs being implemented in the study areas



Regarding knowledge of various aspects of the programs being implemented, 33% of the respondents were aware of the target beneficiaries of the programs, 19% of the implementers, and 11% of the program plan and amount of budget (Figure 5.8). These percentages vary among different hazard zones as shown in Annexure Table 7.13.

Figure 5.8: Percentage of respondents with knowledge of different aspects of the programs being implemented



Access to information plays a role in determining respondent's knowledge of various aspects of the programs being implemented. For example, respondents' knowledge of target beneficiaries is correlated with their information coverage, declining with decrease of access to information (Annexure Table 7.14). Also, about half of the respondents with access to all the information channels but only 13% of those without such access are aware of the implementers of the programs in their areas.

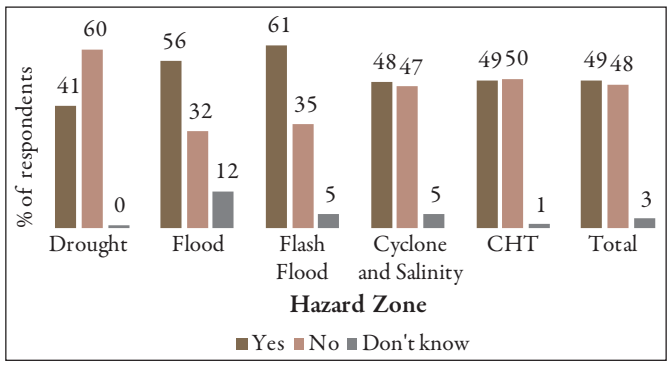
Females are more aware of the programs being implemented to combat climate change than males—while about 52% of females know about the programs, only 39% of males do so. Females were found to be more aware than males about the target beneficiaries and implementers of the programs, and the program time lines (Annexure Table 7.15).

5.4 People's Experience about the Workings of Climate Change Actions

5.4.1 Priority to the Most Vulnerable People

People were asked whether the most vulnerable people were given priority in the programs being implemented in their areas. Opinion was almost equally divided—about half of the respondents said the most vulnerable groups are given priority while the other half considered they are not (Figure 5.9). In the areas exposed to flood and flash flood, about 60% people said that priority is given to most vulnerable people. In drought areas on the other hand, 60% of respondents think the most vulnerable are not given priority.

Figure 5.9: Have the programs given priority to the most vulnerable people?



5.4.2 Challenges of the Programs to Prioritize the Most Vulnerable People

According to the respondents, corruption at different levels of government is a major factor preventing prioritization of the most vulnerable groups. By contrast, local government officials viewed lack of capacity and inadequate support as the major limitations to reach the most vulnerable people.

5.5 Means of Delivering Support

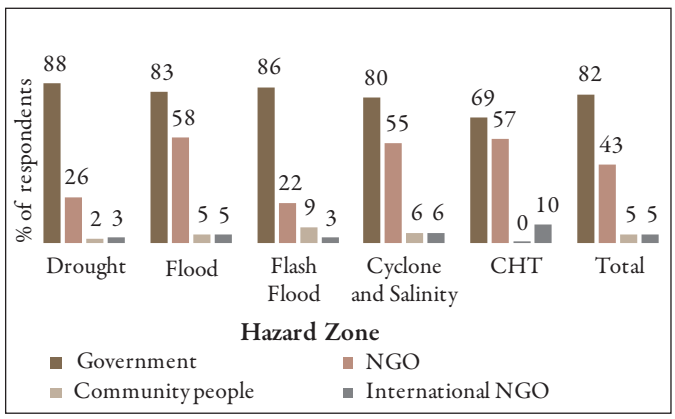
5.5.1 Channels Used for Implementing the programs

The household respondents were asked about the actors who are implementing programs in their areas to deal with the impacts of climate change. Over 80% of the respondents said that the government is implementing the programs, while 43% thought NGOs are doing so (Figure 5.10; see also Annexure Table 7.16 for details).

5.5.2 Respondent's View about the Most Appropriate Channel for Program Delivery at Local Level

Over 40% of the respondents stated that the most appropriate channel to implement programs to tackle climate change is the Government, despite corruption accusations they had put on the concerned Government officials and law makers. About 35% of respondents thought that NGOs comprise the most appropriate channel.

Figure 5.10: Who are the actors implementing the programs?



5.6 Planning and Participation

5.6.1 Existence of Any Plan on Disaster Management

45% of the respondents do not know if there is a climate change or disaster management plan in their union or upazila (Figure 5.11). Female respondents are less aware of the existence of such plans (Figure 5.12).

Figure 5.11: Do respondents know if there is a climate change or disaster management plan in their union or upazila

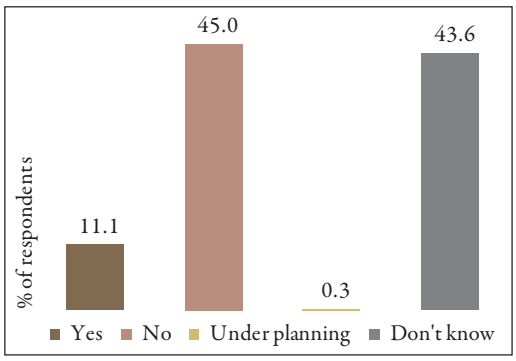
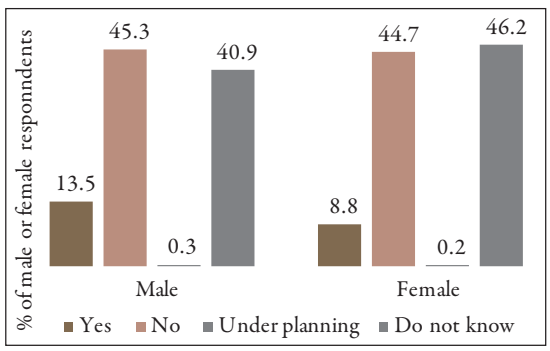


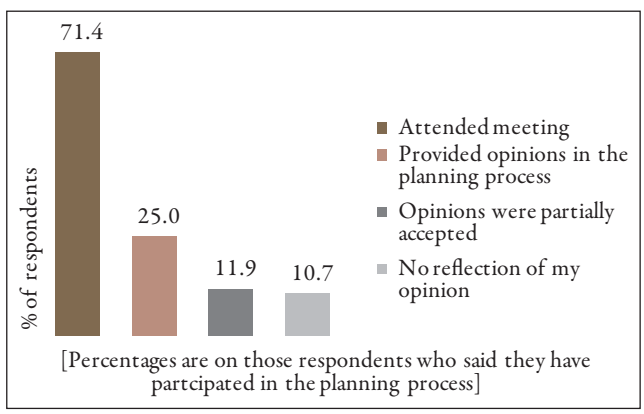
Figure 5.12: Do respondents know if there is a climate change or disaster management plan in their union or upazila (by gender)



5.6.2 Nature of Participation of the Respondents in Planning

The respondents who knew about the existence of climate change or disaster management plans in their union or upazila were further asked about the nature of their participation in plan formulation. Over 70% of the respondents who participated in any such planning (n=84), reported their participation consisted of attending meetings (Figure 5.13). But only a quarter of the respondents asserted that they provided opinions in the planning process.

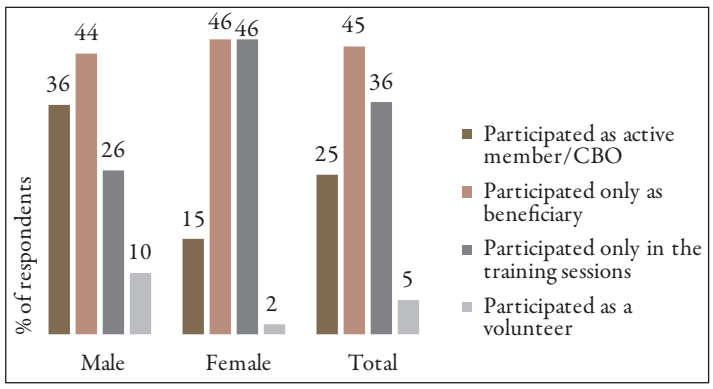
Figure 5.13: Nature of participation of those respondents who participated in the planning process



5.6.3 Women and Girl's Participation in the Programs

When the respondents were asked about any intervention in the area to address issues of climate change with specific focus on women and girls, only 10% of the respondents mentioned the existence of such interventions. This was mentioned by 21% of the respondents from flood zones and only 1.5% from drought zones. Of the respondents who knew about any women and/or girl specific intervention (n=259), 45% said that the women and girls participated only as beneficiaries, while 36% said women and girls participated only in the training sessions (Figure 5.14).

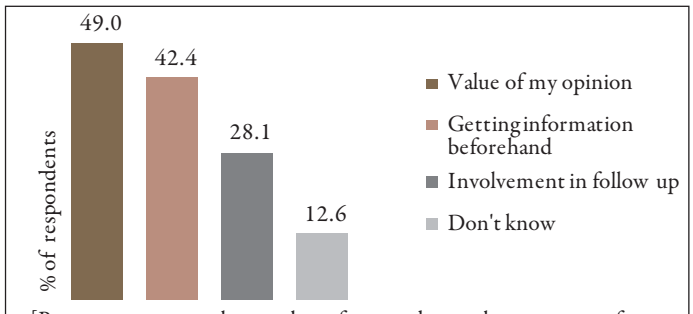
Figure 5.14: Nature of participation of women and girls in programs with specific focus on women's and girls' issues



5.6.4 Ways to Increase People's Participation

Respondents who were aware of any climate change or disaster management plans in their union or upazila but either have not participated or ineffectively participated in their planning were asked about what is needed to increase their participation in local planning. About half of the respondents were of the view that valuing their opinion will increase their participation (Figure 5.15; Annexure Table 7.17). Over 40% mentioned advance information will increase participation.

Figure 5.15: Respondents' opinion on what needs to be done to increase their participation in local level planning of climate change or disaster management plans



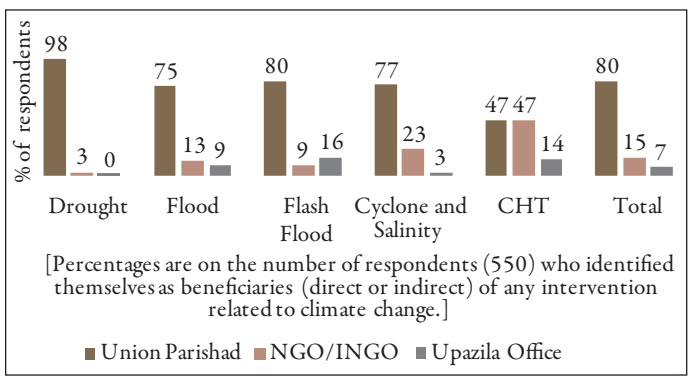
[Percentages are on the number of respondents who are aware of any disaster management plans in their union or upazila but either have not participated or ineffectively participated in their planning.]

5.7 Ways of Obtaining Services Related to Climate Change

5.7.1 Channels through which Services are Delivered to the Beneficiaries

550 respondents (21% of the study population) identified themselves as beneficiaries (direct or indirect) of any intervention program related to climate change being implemented in their areas. Of them, 80% mentioned that they are getting the benefits from Union Parishad, while 15% considered NGOs/INGOs as the channels for delivering the benefits (Figure 5.16; details in Annexure Table 7.18).

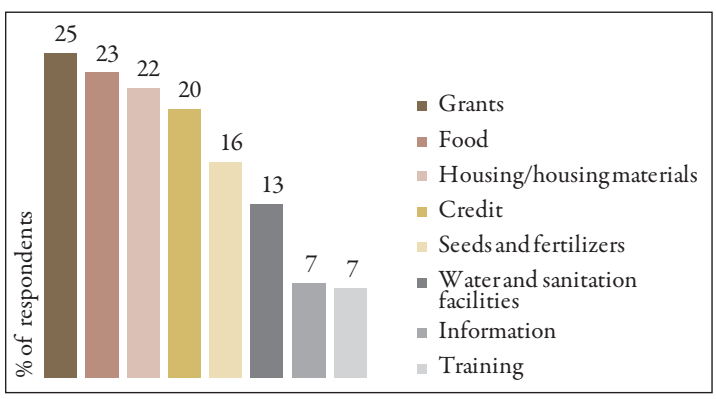
Figure 5.16: Respondents' identification of channels through which benefits of climate change interventions are delivered to the people



5.7.2 Resources Provided to the Beneficiaries

Respondents identified a number of resources provided to them by the interventions for coping with or adapting to climate change. These include grants, food, housing support, and credit (Figure 5.17; details in Annexure Table 7.19).

Figure 5.17: Resources provided to people by the interventions for coping with or adapting to climate change

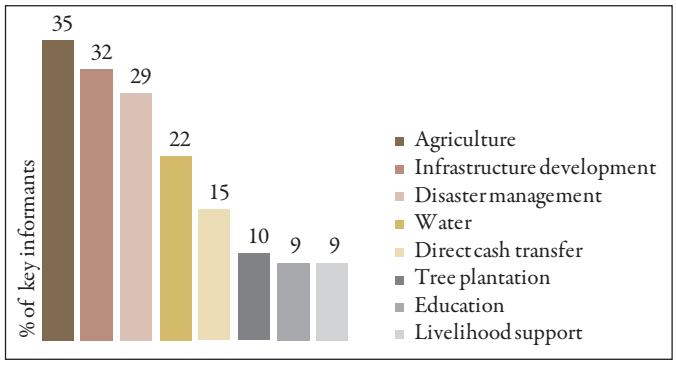


5.8 Management and Governance of Climate Change Programs

5.8.1 Specific Programs Based on Climate Change Plans

The climate change programs mentioned by the key informants are mostly related to agriculture, infrastructure development, and disaster management. Other programs that have been cited include water, tree plantation, education, and cash transfer programs (Figure 5.18; details in Annexure Table 7.20)

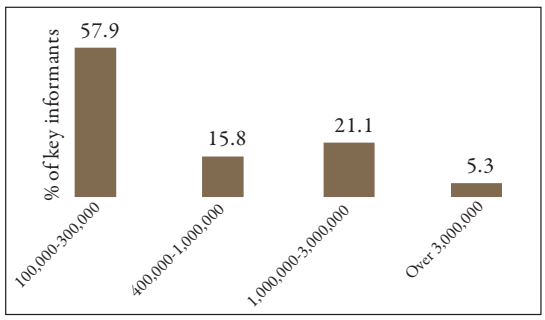
Figure 5.18: Specific programs in study areas based on the climate change plan (from KII)



5.8.2 Information on Fund Allocated for Climate Change

The key informants were asked about the fund allocation for climate change initiatives in their district/upazila. Only 10% stated that climate change funds were allocated to their district/upazila. Regarding the amount of fund in the last fiscal year, 58% of the key informants mentioned that most of the funds were within Taka 300,000 (Figure 5.19). Only 5% said that the funds in last fiscal year exceeded Taka 3 million.

Figure 5.19: Opinion of key informants regarding amount of climate change fund allocated to their area in last fiscal year



5.8.3 Means of Fund Disbursement

58% of the key informants said that most of the climate change fund in their area was disbursed through Upazila Parishads. Other channels are Union Parishad and different Divisions/Directorates of the Government (Figure 5.20). About 23% of the respondents said that the funds were absolutely insufficient while 65% said that funds were insufficient (Figure 5.21).

Figure 5.20: Key informants' views on channels through which funds were disbursed

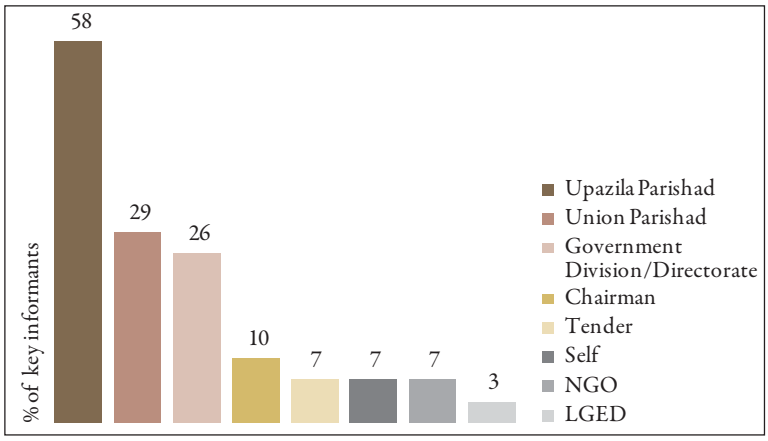
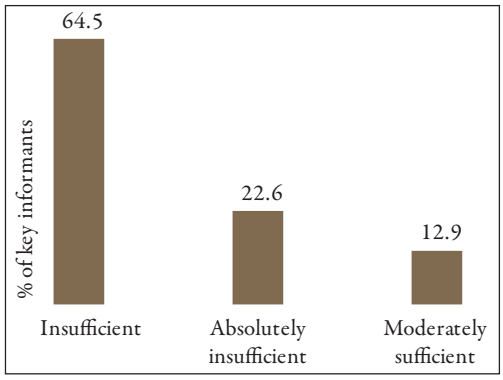


Figure 5.21: Key informants' views on sufficiency of climate change fund allocated to their areas



5.8.4 Technology Introduced to Adapt to Climate Change

Among to 40% of the key informants, new technologies (mostly in social forestry and building of embankments) were introduced to adapt to climate change in their areas (Figure 5.22; details in Annexure Table 7.21). About 70% of key informants felt that the technologies that are being used at this moment are inadequate (Figure 5.23).

Figure 5.22: Key informants' views on new technologies introduced to adapt to climate change

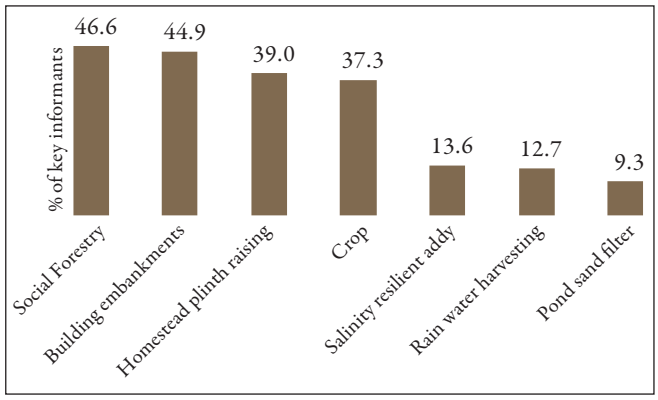
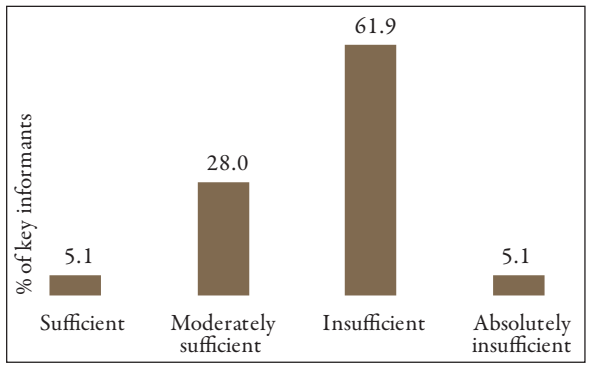


Figure 5.23: Key informants' views on adequacy of new technologies introduced to adapt to climate change



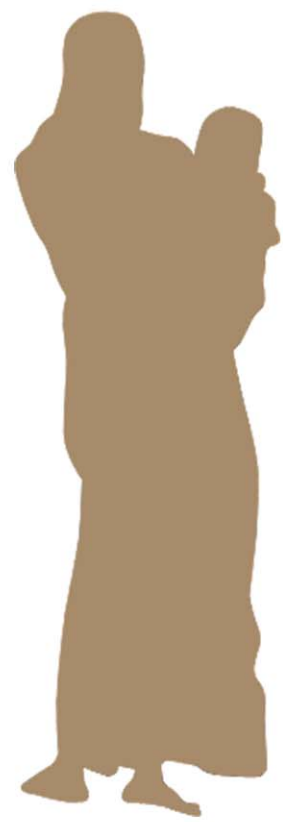
chapter 6

"many people are unaware whether their existing ability would be sufficient to adapt to the changes. A large number of people are uncertain about the solution to the problems they are already experiencing."

6 Conclusions and Recommendations

6.1 Knowledge and Perception of Climate Change and its Effect

General people as well as other stakeholders are more or less familiar with the term 'climate change'. However, the understanding of 'climate change' and its causes varied widely among them. While many respondents thought that climate change is synonymous with flood, many took it as heavy or irregular rainfall, storm, drought, or some other type of natural disaster. Moreover, when talking about the reasons for climate change, respondents of the household survey as well as key informants and other stakeholders mostly blamed 'Nature' or 'God', indicating lack of proper understanding among the people from all spheres of society.



Irrespective of the level of understanding of climate change, the study found a high level of awareness about the effects of climate change. Irregularities of rainfall and increased temperature were the most commonly mentioned results of climate change. As impact of climate change, loss of agricultural crop, food, health hazards and housing hazards were reported widely. A large majority of the respondents said that their households have already been affected by climate change.

6.2 Experience of Natural Disaster

The impact of natural disasters on the lives and livelihoods of the study population is already high. It is clear from the study that climate change resulting in higher frequency of natural disasters is most likely to have great consequences on social, economic and political aspects of people's lives.

6.3 Existing Practice to Adapt to Climate Change

The study population adopted whatever means that they could afford to adapt to climate change. They also utilized their existing knowledge in dealing with disasters to explain the changes and identify adaptive measures. However, limits of such measures are also clearly conceptualized by the study population. Yet, many people are unaware whether their existing ability would be sufficient to adapt to the changes. A large number of people are uncertain about the solution to the problems they are already experiencing.

6.4 Participation in Climate Change Interventions

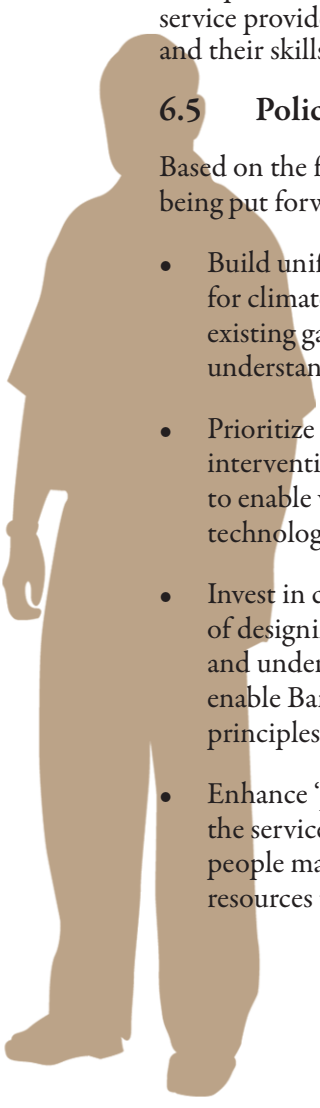
Despite being a country with a high level of political commitment to deal with climate change supported by plans and programs, people are largely not aware of these plans and programs. This is true for both ordinary people and representatives of Government and non-government organizations at local level.

The people also tend to relate the existing experience with service providers as an important factor to obtain likely services for adaptation. The capacity of the service providers is limited in terms of their understanding of climate change and their skills to address it.

6.5 Policy Recommendations

Based on the findings of the study, the following policy recommendations are being put forward:

- Build uniformity of views among local and national stakeholders for climate change policies and actions. This will help in closing the existing gaps in knowledge and understanding of climate change, and understanding of measures required to address it.
- Prioritize the issues affecting women and girls in all policies, plans and interventions on climate change. Specific investments should be made to enable women and girls to access information, knowledge, skills and technology necessary to adapt to climate change.
- Invest in capacity building for the vulnerable population both in terms of designing adaptation measures as well as enhancing their knowledge and understanding of policies and politics of climate change. This will enable Bangladesh to achieve solutions to climate change impacts based on principles of climate justice.
- Enhance 'political efforts' to address the existing governance challenges in the service delivery systems in Bangladesh. Otherwise, the most vulnerable people may not get their fair share of the national and international resources that are available to deal with climate change.



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Annexure

7 Additional Tables

Chapter 2

Table 7.1: Respondents' highest level of education, by age and gender (%)

Age Group (Years)	Illiterate		1-5 class		6-10 class		More than 10 class		Hafezi	Total	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Male	Female
15-19	0.4	0	3.4	4.9	6.7	7.7	4.6	9.4	0	3.5	4.5
20-24	3.7	5.1	17.3	17.6	15	30.7	18.3	33.1	0	11.9	18.8
25-29	8.6	12.0	16.5	24.5	17.1	20	15.7	22.0	42.9	13.9	18.7
30-34	7.7	18.2	9.0	16.7	13.2	13.6	12.7	15.7	28.6	10.4	16.2
35-39	15.1	20.9	13.5	13.8	7.8	10.9	9.6	12.6	14.3	11.8	15.2
40-44	16.3	18.2	9.8	10.4	9.1	7.7	10.7	3.9	0	12.0	11.6
45-49	9.5	11.3	7.5	6.9	9.6	4.7	6.6	1.6	0	8.6	7.2
50 and above	38.7	14.2	22.9	5.2	21.5	4.7	21.8	1.6	14.3	27.9	7.8
Total (N)	**465**	**450**	**266**	**347**	**386**	**404**	**197**	**127**	7	**1321**	**1328**

Table 7.2: Respondents' profile according to occupation and gender (%)

Profession	Male	Female	Total
Housewife	0	87.4	43.8
Agriculture	29.9	0.5	15.1
Small business	17.0	0.3	8.6
Skilled labor	13.2	1.3	7.2
Day laborer	11.3	2	6.6
Student	4.1	3.6	3.9
Unskilled labor	6.6	0.8	3.7
Private service	4.1	0.5	2.3
Retired	4.3	0.1	2.2
Government service	2.6	0.4	1.5

Table 7.3: Percentage distribution of respondents according to their reported impact of last natural disaster on their life and livelihood

Impact of last natural disaster	Drought	Flood	Flash Flood	Cyclone and Salinity	CHT	Total
Death of household member/s	1.2	0.3	0.2	1.3	0	0.7
Missing household member/s	2.7	1.8	1.7	1.3	4.3	2.1
Destroyed home completely	61.5	21.5	41.7	17.8	34.8	34.8
Destroyed home partially	35.1	54.8	47.1	58.1	53	49.7
Loss of domestic animals	34.1	28.5	26.7	24.3	21.3	27.4
Loss of crops/fruits/garden/land	44.3	49.3	28.3	51.7	46.2	44.4
Loss of other income earning source	28.3	21.3	20.5	10.9	26.5	20.4
Health hazard of family members	27.2	29.8	33.8	26.4	19.4	27.8
Education of family members disturbed	2.1	12	8.1	7.3	7.5	7.2
Other	3.7	2.5	10.5	2.4	4	4.5
Total	481	400	420	613	253	2167

Chapter 3

Table 7.4: Percentage distribution of respondents according to their observed weather change pattern over the last 10-30 years, by hazard zones

Changes observed by the respondents	Drought	Flood	Flash Flood	Cyclone and Salinity	CHT	Total
Irregular/Insufficient/Heavy Rainfall	88.7	84.3	53.9	85.8	73.7	78.4
Temperatures increased	92.7	75.1	82.0	64.9	41.0	73.0
Increased frequency and magnitude of flood	16.1	57.1	66.6	72.3	71.7	57.0
Increased frequency of cyclone	3.6	23	29.4	29.6	31	23.3
River erosion	0.6	10.2	7.5	5.2	18.3	7.2
Drought	14.2	1.9	2.3	0.9	1.7	4.1
Seasonal change	0.2	1.5	3.8	1.8	4.7	2.2
Sea level raised	2.7	0.6	3.8	1.1	1.0	1.9
Increase in the intensity of salinity in land	0.2	2.3	0.8	2.2	1.0	1.4
Crop failure	43.3	22.4	27.8	22.7	16.0	27.0
Increased health hazard	1.9	10.7	18.8	11.7	7.3	10.5
Severe impact on food and nutrient security	0.4	1.3	6.0	0.5	2.7	2.0
Other	1.0	1.7	8.8	2.6	10.0	4.2
Total	522	522	521	783	300	2648

Table 7.5: Percentage distribution of respondents according to the reported climate change effects at the household level

Types of climate changes effects at the household level	Drought	Flood	Flash Flood	Cyclone and Salinity	CHT	Total
Agricultural production hampered	62.6	60.6	52.2	48.1	54.3	55.2
Loss of trees/gardens/house	14.6	26.0	33.7	46.4	37.1	31.9
Health hazard	24.9	36.9	37.9	29.9	15.1	29.9
Loss of income	35.1	25	26.5	31.3	26.1	29.4
Loss of domestic animals	13.5	13.9	17.7	15.8	12.7	15.0
Scarcity of safe drinking water	18.2	6.7	16.7	4.6	16.7	11.9
Migration	0.8	1.8	29.1	2.1	9.4	7.9
Increased drop out of children from school	0.2	1	1.2	0.2	0.4	0.6
Others	1.5	1.8	4.9	4.0	12.7	4.2
Total	473	388	412	582	245	2,100

Table 7.6: Respondents opinion on how climate change problems can be mitigated (% of households)

Solution	Male	Female	Total
Self-resilience	28.1	27.3	27.7
Assistance from the society/community level	31.3	36.5	33.8
Government safety net program	53.7	70.7	62.0
Assistance from international donors	15.0	14.7	14.9
Assistance from NGOs	14.8	14.4	14.6
Assistance from private sources/means	5.1	8.4	6.7
Gas emission mitigation from big industries	0.8	0.3	0.5
Building more cyclone centers	0.0	0.2	0.1
More training	1.1	0.5	0.8
Building river dams	0.8	1.6	1.2
Stopping wood cutting	1.2	2.5	1.9
Control over population growth	0.5	0.5	0.5
Governmental assistance	3.6	0.6	2.2
More tree plantations	2.3	0.6	1.5
More prayers to Allah	2.6	2.7	2.6
Assistance from the Chairman	0	0.5	0.2
More innovation by scientists	0.8	0	0.4
Increasing awareness	0.9	0.8	0.9
Digging canals	0.8	0.8	0.8
More drainage connections	0.2	0	0.1
Stopping hill cutting	0.2	0.3	0.2
Increased educational coverage	0	0.3	0.2

Solution	Male	Female	Total
Building more culverts	0	0.3	0.2
Assistance from the UP Members	0.2	0.2	0.2
River and canal cleaning	**0.2**	**0.2**	**0.2**
Greenhouse effect	**0.2**	**0**	**0.1**
Control of black smoke from vehicles	**0.2**	**0**	**0.1**
Do not know/Cannot tell	**3.5**	**1.9**	**2.7**
Total (N)	**661**	**631**	**1292**

Chapter 4

Table 7.7: Action of Government to deal climate change (% of households)

Government Action	Drought	Flood	Flash Flood	Cyclone and Salinity	CHT	Total
Yes	66.7	43.5	39.5	58.0	44.7	51.7
No	29.7	33.9	40.4	28.5	52.7	34.9
Do not know	3.6	22.6	20.1	13.5	2.7	13.4
Total (N)	522	522	522	783	300	2649

Table 7.8: Percentage distribution of respondents according to the reported actions taken to adapt to climate change

Activities done to adapt to climate change	Drought	Flood	Flash Flood	Cyclone and Salinity	CHT	Total
Raised the plinth of homestead	**82.9**	**88.2**	**87.5**	**81.1**	**80.0**	**84.2**
Migration	**6.0**	**8.6**	**5.4**	**8.3**	**2.9**	**7.0**
Floating vegetable and spice garden	**2.0**	**13.7**	**1.8**	**9.0**	**1.4**	**6.8**
Planted trees	**1.2**	**2.7**	**4.2**	**8.3**	**4.3**	**4.3**
Built pucca house	**6.7**	**2.0**	**1.2**	**4.0**	**11.4**	**4.2**
Others	**4.4**	**0.0**	**1.2**	**1.7**	**0.0**	**1.7**
Total (N1 = Number of respondents who said their households have taken some action to adapt to climate change)	**252**	**255**	**168**	**301**	**70**	**1046**
All respondents (Number = N)	**522**	**522**	**522**	**783**	**300**	**2649**
N1 as a percentage of N	**48.3**	**48.9**	**32.2**	**38.4**	**23.3**	**39.5**

Table 7.9: Reasons for not doing anything to adapt to Climate Change

Reason	Drought	Flood	Flash Flood	Cyclone & Salinity	CHT	Total
	[% of respondents who have not done anything to respond to climate change]					
Don't know what to do	61.9	62.2	65.3	44.8	47.8	55.5
Didn't feel necessity to do anything	18.1	11.2	5.1	10.4	10.9	10.7
Know what to do, but don't have the money/logistics/technology	7.8	20.6	18.4	36.1	38.3	25.1
It's too big a problem for me to solve	19.3	9.7	16.9	12.0	5.2	13.0
Base: Number of respondents who have not done anything to respond to climate change (N1)	270	267	354	482	230	1603
All respondents (Number = N)	522	522	522	783	300	2649
N1 as a percentage of N	51.7	51.1	67.8	61.6	76.7	60.5

Chapter 5

Table 7.10: Awareness of respondents on Government's plans to deal with climate change, by information coverage

Awareness	Access to all information sources	At least one information source	No access to information	Total
Yes	**55.9**	**32.3**	**23.8**	**31.8**
No	**42.4**	**66.2**	**75.9**	**66.9**
Somewhat	**1.7**	**1.4**	**0.3**	**1.3**
Total (N)	**59**	**2266**	**324**	**2649**

Table 7.11: Percentage distribution of respondents according to their knowledge of work of Government to deal with climate change (by hazard zone)

Government's work on Climate Change	Drought	Flood	Flash Flood	Cyclone and Salinity	CHT	Total
Cash transfer	92.2	75.7	51.6	71.9	67.3	75.3
Planning, making policy and doing research	21.1	39.9	43.8	52.7	30.8	36.8
Distributing food, houses, cattle etc.	6.3	6.8	18.8	7.6	12.1	9.2
Fund	6.7	4.7	21.9	7.1	3.7	8.3
Others	0.7	4.1	7.8	3.6	4.7	3.5
Total	270	148	128	224	107	877

Table 7.12: Percentage distributions of respondents' on what Government or Union Parishad is doing to deal with climate change

Action to deal with Climate Change	Drought	Flood	Flash Flood	Cyclone and Salinity	CHT	Total
Cash transfer	35.9	66.5	21.4	36.1	64.2	41.6
Food distribution	3.4	20.7	39.3	45.8	47.0	30.0
Housing/housing materials	37.4	26.9	18.4	22.7	22.4	26.4
Water and sanitation facilities	43.7	15	17	18.5	11.9	23.4
Seed distribution	38.2	32.6	2.9	18.9	3.7	22.2
Building embankments	32.8	12.8	19.4	9.7	6.7	17.2
Building cyclone shelters	0	6.2	17	16.1	1.5	9.1
Providing training on farming	2.6	8.4	3.4	2	1.5	3.4
Others	2	3.1	10.7	9.7	5.2	6.4
Number of respondents who affirm that Government or Union Parishads are doing something to deal with climate change = N1	348	227	206	454	134	1369
All respondents (Number = N)	522	522	522	783	300	2649

Table 7.13: Respondents' level of knowledge regarding different aspects of programs being implemented in the study areas

Different aspects of programs being implemented	Drought	Flood	Flash Flood	Cyclone and Salinity	CHT	Total
Target beneficiaries	66.3	7.3	25.9	30.9	39.7	33.2
Implementers	5.9	4.6	17	26.4	46.3	18.5
Program plan	12.6	6.5	16.9	9.6	8.3	10.9
Amount of Budget	5.4	5.9	22.4	8.4	11.7	10.5
Time line	23.6	1.9	2.1	3.6	6.7	7.2
Total	522	522	522	783	300	2649

Table 7.14: Respondents' level of knowledge regarding different aspects of programs being implemented in the study areas according to information coverage (%)

Knowledge about program	Access to all information sources	At least one information source	No access to information	Total
Target beneficiaries	52.5	33.5	27.5	33.2
Implementers	45.8	18.6	13	18.5
Program plan	18.6	11	8.6	10.9
Amount of Budget	16.9	11	5.2	10.5
Time line	15.3	7.4	4.6	7.2
Total (N1)	59	2266	324	2649

Table 7.15: Respondents' level of knowledge regarding different aspects of programs being implemented in the study areas according to gender (%)

Knowledge about program	Male	Female	Total
Target beneficiaries	23.8	42.6	33.2
Implementers	15.8	21.2	18.5
Program plan	12	9.7	10.9
Amount of Budget	11.1	9.9	10.5
Time line	3.5	11	7.2
Total (N)	1321	1328	2649

Table 7.16: Percentage distribution of respondents' opinion on Channel used for implementing the programs

Channel used	Drought	Flood	Flash Flood	Cyclone and Salinity	CHT	Total
Government	87.9	83.2	85.8	80.2	69.0	82.2
NGO	25.5	57.9	22	55	57.2	43.3
Community people	2.3	5.1	8.8	5.8	0	4.9
International NGO	3.1	4.7	3.1	5.7	10.1	4.9
Private means	1.2	3.3	2.5	6.5	3.7	3.7
Chairman	0.2	0.2	1.7	0.5	0.3	0.6
Union	0.2	0	0.8	0	0.7	0.3
Member	0	0	1.1	0.1	0.7	0.3
Pauroshova	0	0	0.2	0	1.7	0.2
Do not know	4.8	5.7	5.6	4.2	2.4	4.7
Total	521	513	522	756	297	2609

Table 7.17: Respondents' opinion on what needs to be done to increase their participation in local level planning of climate change or disaster management plans

What need to be done to increase the participation	Drought	Flood	Flash Flood	Cyclone and Salinity	CHT	Total
Value of my opinion	77.5	34.0	46.4	36.6	27.8	49.0
Getting information beforehand	5.6	72.0	48.2	64.8	38.9	42.4
Involvement in follow up	62.9	16.0	10.7	11.3	19.4	28.1
Do not know	6.7	16.0	7.1	19.7	16.7	12.6
Total (Number = N1)	89	50	56	71	36	302

Table 7.18: Respondents' opinions as to the channels from which they are receiving benefits from intervention programs related to climate change

Medium to obtain the services	Drought	Flood	Flash Flood	Cyclone and Salinity	CHT	Total
Union Parishad	98.4	75.4	80.1	76.9	46.5	80.2
NGO/INGO	3.1	13.0	8.5	22.5	46.5	15.1
Upazila Office	0	8.7	15.6	3.0	14.0	7.1
MP/political leaders/parties	7.0	0	2.8	6.5	0	4.4
Local elites/other community leaders/private means	0.8	1.4	5.0	1.8	2.3	2.4
Other local organizations (schools, mosques, committees, CBOs, etc.)	0	1.4	2.1	0.6	0	0.9
Ekota Mohila Samity	0	0	1.4	0	2.3	0.5
Ward Commissioner	0	0	2.8	0	0	0.7
From BD hall	0.8	0	0.7	0	0	0.4
From City Corporation	0	0	0.7	0	0	0.2
From the local mohajon	0	0	0.7	0	0	0.2
From Pauroshova	0	4.3	0	0.6	0	0.7
Total	128	69	141	169	43	550

Table 7.19: Percentage distribution of respondents according to their opinion on resources provided to the respondents for coping/adapting with climate change

Resources provided for coping/ adapting	Drought	Flood	Flash Flood	Cyclone and Salinity	CHT	Total
Grants	33.5	26.1	6.7	25.2	36.7	24.7
Food	1.5	13.0	35.1	32.3	34.3	23.2
Housing/housing materials	28.5	16.5	21.6	19.7	26.7	22.0
Credit	42.1	24.7	10.7	15.8	4.0	20.4
Seeds and fertilizers	20.7	25.5	7.9	16.9	6.7	16.4
Water and sanitation facilities	30.1	8.2	8.0	10.7	7.7	13.2
Information	1.1	10.7	8.0	6.6	11.3	7.2
Training	4.6	13.4	5.7	6.4	2.0	6.8
Did not get any assistance	3.8	7.5	19.7	9.8	10.7	10.2
Do not know	1.5	6.7	8.0	4.2	2.7	4.8
Total	522	522	522	783	300	2649

Table 7.20: Specific programs in study areas based on the climate change plan (from KII)

Programs	Total
Agriculture	**35.2**
Infrastructure development	**31.8**
Disaster management	**29.0**
Water	21.6
Direct cash transfer	15.3
Tree plantation	10.2
Education	9.1
Livelihood support	9.1
Increase awareness	4.5
Fishery	4.0
Build embankment	2.3
Block beside the river bank	1.7
Sanitation	1.7
Replaced people from the risk zone to safe zone	1.1
Food	1.1
Livestock	1.1
Stop hill cutting	1.1
Action plan on pre and post disaster	1.1
Total (N)	176

Table 7.21: Technology used to adapt to climate change in the study areas (from KII)

Technology	Total
Social forestry	46.6
Building embankments	44.9
Homestead plinth raising	39
Crop	37.3
Salinity resilient paddy	13.6
Rain water harvesting	12.7
Pond sand filter	9.3
Fish farming	3.4
River digging	2.5
Building cyclone center	1.7
Installing deep tube wells	0.8
Rise school building	0.8
New technologies for irrigation	0.8
River training	0.8
Food processing for livestock	0.8
Total (N)	118