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Gender and Climate Change in Bangladesh The Role of Institutions in Reducing Gender Gaps in Adaptation Program

Nilufar Ahmad

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Gender and Climate Change in Bangladesh The Role of Institutions in Reducing Gender Gaps in Adaptation Program

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Acronyms

BCCSAP	Bangladesh Climate Change Strategy and Action Plan
CCC	Climate Change Cell
CCCP	Community Climate Change Project
CDMP	Comprehensive Disaster Management Programme
CIFs	Climate investment funds
CLP	Char Livelihoods Programme
CSO	Civil society organization
DEA	Department of Agriculture Extension
DFID	Department for International Development
DMB	Disaster Management Bureau
DMCs	Disaster management committees
DoE	Department of Environment
DPHE	Department of Public Health Engineering
DRM	Disaster risk management
DWA	Department of Women Affairs
ECRP	Emergency 2007 Cyclone Recovery Project
GoB	Government of Bangladesh
IPCC	Intergovernmental Panel on Climate Change
LGD	Local Government Division
LGED	Local Government Engineering Department
LGIs	Local government institutes
LGSP	Local Governance Support Project
MDA	Ministries, departments, and agencies
MDG	Millennium Development Goal
MFDM	Ministry of Food and Disaster Management
MoA	Ministry of Agriculture
MoE	Ministry of Energy
MoEd	Ministry of Education
MoEF	Ministry of Environment and Forest
MoH	Ministry of Health
MoLGRD&C	Ministry of Local Government, Rural Development, and Co-operatives

MoWR	Ministry of Water Resources
MWCA	Ministry of Women Affairs
NAPA	National Adaptation Program of Action
NARI	Northern Areas Reduction of Poverty Initiative
NCWD	National Council for Women's Development
NDMC	National Disaster Management Council
NEC	National Environment Council
NGO	Nongovernmental organization
NILG	National Institute of Local Government
PACA	Participatory Adaptation Capacity Assessment
PPCRs	Pilot programs on climate resilience
PRA	Participatory Rural Appraisal
RVCC	Reducing Vulnerability through Climate Change
SDF	Social Development Foundation
SIPP	Social Investment Program Project
Tk	Taka
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
URTs	Upazila Resource Teams
WDB	Water Development Board
WDR	World Development Report
WID	Women in Development

Summary

This study on Bangladesh was undertaken to analyze the gender dimensions of climate change and the role of institutions in reducing gender gaps. The study was carried out in 20 sites covering 600 households, from March 2010 to May 2011, using both qualitative and quantitative instruments.

Four propositions derived from global literature guide the analysis. First, the survey results from both rural and urban areas support that *vulnerability to climate change is gendered*, because women are disproportionately vulnerable to natural hazards due to social norms, entrenched gender inequality and reproductive responsibilities, all of which constrain women's mobility and survival options. Secondly, household data substantiate that *adaptive capacity is gendered*, because women have less control over capitals, limited economic opportunities and lack voice in decision making, and these factors reduce women's capacity to adapt and overcome hazards. Third, data support that households have been using *migration as an adaptive strategy that is gendered*. While men migrate to nearby areas and work as agricultural laborers or rickshaw pullers, women migrate to large cities, because there are few economic opportunities for them in rural areas and small towns. Finally, *access to institutions that can help increase adaptive capacity is also gendered*; findings reveal that very few women have access to public institutions, and as a result are not able to access adaptation information and support. The findings also reveal that when institutions promote gender inclusion, they can help women emerge as change agents with higher adaptive capacity.

The survey results indicate that government measures to reduce households' sensitivity to hazards have decreased the number of hazard-related deaths and reduced household vulnerability. However, with increased climate variability and events, the adaptive capacity of rural households is constrained because their livelihoods are based on climate-vulnerable natural resources, they have low asset bases, and there is a shortage of economic and other opportunities in rural areas. Findings reveal that climate change programs are limited to central ministries, and lack of coordination among agencies hampers adaptation support to communities. Furthermore, centralized planning and budgeting constrains local institutions delivering need-based support to emerging hazards.

To reduce the vulnerability of women, government can implement targeted programs for increasing women's endowments (education and skill development), economic opportunities (employment and credit), and empowerment (decision making in adaptation program). While some adaptation programs are being implemented by national agencies, local adaptation funds and decision making can be transferred to local level institutions, and funds be earmarked for capacity building and projects focused on enhancing women's adaptive capacity. Currently, 30 percent of local government leaders are women, and budgets can be earmarked for their capacity building, as well as for civil society organizations supporting the process. A gender action plan for the Bangladesh Climate Change Strategy and Action Plan (BCCSAP), with activities, timelines, indicators and budgets can be developed to strengthen the level of preparedness for gender-responsive climate change program. Government can align climate change, disaster management and gender equality structures for greater synergy, and expand integrated support to local institutions and communities. Urban planning can consider migration issues to build the long-term resilience of the population, focusing on the different needs and constraints of women and men

1. Introduction

Understanding the gender dimensions of climate change is important for adaptation.

Bangladesh is recognized as one of the countries most vulnerable to climate risk; global warming, sea level rise, and weather variability are already affecting the lives and livelihoods of its people. Various studies also indicate that women are more vulnerable than men, both to short-term recurring climatic events (major natural disasters) as well as long-term climate-induced changes (sea level rise, salinity intrusion in water and soil, land erosion, drought), because they magnify existing social and gender inequalities. In more gender-egalitarian contexts, where economic and social rights are fulfilled for both sexes, the same number of women and men die in disasters; however, where rights are not equal, more women die (Neumayer and Plümper 2007). Despite high levels of poverty, frequent natural disasters and weak governance, Bangladesh has also made substantial progress toward gender parity in primary and secondary education and increased women's participation in the labor force (52 percent). Gender-based shifts in economic opportunities, women's mobility outside the home, and income are slowly changing family and social norms; however, unequal intrahousehold power relations and gender-based socioeconomic, cultural, and institutional constraints remain (Nazneen, Hossain, and Sultan 2011). Understanding gender dimensions of climate change and taking responsive actions will be important for Bangladesh adaptation programs to achieve equitable outcomes.

Objectives of this study. This study was undertaken to understand gender dimensions of climate change, key factors determining individual vulnerability, and how institutions and adaptation programs can improve resilience and reduce gender gaps, if any. Specifically, the key research questions were:

(i) Are women more vulnerable than men to climate change?

Box 1. Key Definitions

Vulnerability refers to susceptibility to external stresses. It includes exposure to risk, sensitivity to that risk and adaptive capacity, as described below (IPCC 2007).

- **Exposure** refers to external stress to people or communities caused by factors such as changes in rainfall and temperature patterns due to climate change.
- **Sensitivity** refers to the extent to which communities are susceptible to exposure to the stress.
- **Adaptive capacity** refers to the ability to overcome and recover from the external stress. Factors affecting adaptive capacity include capitals and rights.

Coping action refers to a short-term survival action that may reduce adaptive capacity in the long run. Such actions include reducing consumption, withdrawing children from school, and/or distress sale of land/assets.

Resilience is the ability to absorb shocks, to adapt both in advance and in reaction to shocks.

Hotspot refers to an area that is regularly affected by natural disasters and incremental climate change.

Climate-related hazards are (i) drought; (ii) flood; (iii) cyclone and tidal surge; (iv) sea level rise and salinity; (v) land erosion; (vi) landslide in the hilly areas; and (vii) urban drainage congestion and flooding.

Institutions refer to formal organizations (public or private) that are the means through which governments and donors channel resources for local development and climate change (Agrawal and Perrin 2009) and informal organizations are the norms and rules that govern the behavior of households and organizations (North 1990; Williamson 2000).

Gender equality refers to (i) the accumulation of *endowments*; (ii) the use of those endowments to take advantage of *economic opportunities* and generate incomes; and (iii) the application of those endowments and opportunities to take actions, or *agency*, affecting individual and household well-being (World Bank 2011b).

Source: Author's compilation.

- (ii) If yes, what are the factors that make women more vulnerable?
- (ii) What measures and adaptation support can be provided by government and other organizations to reduce the gender gaps and improve the resilience of women and men

Audience for this study. The target audiences for this study are the government of Bangladesh and its agencies working in climate change, disaster management and gender equality; management and staff of the World Bank Sustainable Development Network and its country team in Bangladesh; other country teams and counterparts; and donor agencies, nongovernmental organizations (NGOs), and civil society organizations (CSOs).

Analytical approach. The analytical approach for this study draws on the following frameworks, which provide the conceptual and empirical bridge for the integrated framework used to analyze the gender dimensions of climate change adaptation in this study.

- The Sustainable Livelihoods Framework was used to analyze access to and control over natural, physical, human, social, and financial capitals by women and men (DFID 1999; Cahn 2002).
- The Social Capital Analysis (Woolcock 1998) and Social Vulnerability Analysis (Adger 2006) provided guidance on review of social capital at the community level, which plays an important role in facilitating adaptation to climate change.
- The Women's Empowerment Analysis (Parveen and Leonhauser 2004) the *World Development Report (WDR) 2012 Gender Equality and Development* (World Bank 2012b) helped develop gender variables for analyzing gender-based differences.
- The Intergovernmental Panel on Climate Change (IPCC) Framework was used to estimate exposure to hazards, adaptive capacity, and related vulnerability (IPCC 2007).
- To explore the role of institutions and migration, the study draws on the Welfare Regime Framework (Gough and Wood 2004) and the Migration and Global Environmental Challenge Project (Foresight 2011) respectively.

Key propositions. The analytical approach draws from the global climate change and gender literature, which highlights how social norms, power relationships, and decision-making processes influence impacts of climate change on women and men. The following propositions derived from literature guide the analysis:

- i) *Vulnerability to natural hazards is gendered.* A study on the 1991 cyclone revealed that physical disadvantages interact with social norms, role and behavior, putting women at a disadvantage during rescue efforts by limiting their movement and their access to information about cyclone-induced surges (Ikeda 1995). Also, traditional clothing makes running and swimming more difficult for women (Cannon 2002). Social restrictions and entrenched gender inequality adversely affect women's bargaining power, knowledge, and possible adaptation strategies (Nelson et al. 2002, World Bank 2011c).
- ii) *Adaptive capacity is gendered* because it is shaped by control over capitals, opportunities, and agency. One study shows that gender-based inequality limits women's access to and control over resources and social and economic opportunities in Ghana, Senegal and Bangladesh, thus limiting their adaptive capacity (WEDO 2008). Another study reveals that men make most of the decisions even when women have an economic role in the household (World Bank 2011a). Water, sanitation, and health challenges from climate change add to women's double burden of productive and reproductive labor (Enarson 2000).

- iii) *Migration as an adaptive strategy is gendered*, but once migrants are in the urban areas, both men and women's ability to cope is enhanced by the availability of economic opportunities (Foresight 2011; Kartiki 2011; Warner et al. 2009). For women, migration to urban areas can also provide the opportunity to have greater voice in and control over their lives (Ribeiro and Chauque 2010).
- iv) *Access to institutions that can help build adaptive capacity is gendered*. Women have significantly less access to formal institutions of any type than men. Studies indicate that despite women's critical role as users and managers of natural resources, they are largely absent from critical decisions and not able to influence adaptation programs (WEDO 2008; World Bank 2012).

Methodology. The methodology included varied qualitative and quantitative instruments and used the following steps and a series of different but interrelated analyses.

- **Step 1:** Study sites (hotspots) were selected based on three criteria – agroecological constraints, exposure to different types of climatic hazard, and poverty incidence. The study sites include six rural areas chosen from the Gaibandha, Rangamati, Netrokona, Rajshahi, Borguna, and Cox's Bazaar districts; the three urban areas from Dhaka, Chittagong, and Khulna; and a control district (Comilla) that has not been exposed to severe climate events during the last 10 years. An upazila within each district was selected based on exposure to a specific type of hazard, and two different communities or villages that were equally exposed to hazards were selected through discussion with key informants and preliminary field visits. In total, 20 sites were part of the study.
- **Step 2:** The respondents for the qualitative field work were selected by wealth ranking and other participatory exercises and included men and women of different income groups, occupations, and ethnic communities. Around 20 respondents (equal number of women and men) participated in the Participatory Adaptation Capacity Assessment (PACA) workshop in the upazila that included local government leaders and representatives of service providers and communities of the two selected villages.
- **Step 3:** A list of households exposed to the hazards was developed from the qualitative field work and a random sampling method was used to select 30 households from each village and community for the quantitative survey. The field work was conducted from March 2010 to May 2011.

Methods and tools used for data collection. Qualitative instruments included different Participatory Rural Appraisal tools such as village mapping, timeline of hazard events, wealth ranking, life history, focus group discussions, key informant interviews, and PACA workshops. The household module included questions on the sociodemographic, economic and other characteristics of the households, and the gender module included questions derived from the analytical framework, especially on the gender-based variables, exposure, impact, and adaptations to the various climatic hazards experienced by the communities. It also included questions on the gender-based contacts with the institutions and support received in relation to hazards. The quantitative survey included two questionnaires—a household module and a gender module—that were administered to 30 households at each site, covering a total of 600 (420 rural, 180 urban) households. The gender module was administered in separate interviews to both spouses.

Survey Results

The majority of surveyed rural households are poor. The characteristics of the surveyed rural households reveal the following vulnerability and gender characteristics: among the 420 rural households, nearly 38 percent were extremely poor (below lower poverty line), 11 percent moderately poor (between lower and upper poverty line), 34 percent moderately nonpoor (between upper poverty line and 60 percent above), and 17 percent nonpoor (above 60 percent of the upper poverty line). Around 49 percent of the households were functionally landless, with 9 percent having no land and 5.8 percent having lost land due to natural hazards in the last 10 years. Over 21 percent of the surveyed households sold land in the last 10 years, and of those, over 17 percent sold it to cope with natural hazards. About 12 percent of the households sold other assets (such as livestock, furniture, and jewelry) for the same reason. The average number of years of schooling is very low for both adult women and men—about three years, but the school enrollment rate for children is nearly 70 percent. Nearly 80 percent of men work outside home compared to 18.4 percent of women. This reflects the fact that in rural areas, men have more economic opportunities than women, who are mostly involved in unpaid postharvest activities.

Rural households diversify livelihoods to reduce vulnerability. In rural areas, most people work in agriculture and fishing; the majority has both a primary and a secondary occupation. People living in climate-vulnerable areas select secondary occupations that are not dependent on natural resources, and hence are less vulnerable to climate hazards. The average monthly income of rural households is Tk.8,294 (below the upper poverty line). Nearly 56 percent of rural livelihoods depend on climate-dependent natural resources, and thus are vulnerable to climate variability. Most income comes from crops (32 percent); rickshaw pulling is the second highest income generator (17 percent).

Characteristics of urban households with a gender profile. Of the 120 surveyed households, about 73 percent were above the upper poverty line. The average number of years of schooling is very low for both adult women and men—about three years, but the school enrollment rate for children is approximately 55 percent, 15 percent lower than rural areas. About 83 percent of the households derive their income from non-natural resource-based activities; the average income is Tk. 8,314 (above the upper poverty line per capita). Over 40 percent of women work outside the home as garment workers and domestic servants, while men work as rickshaw/van pullers, transport and construction workers, and in small business.

Structure of This Note

This note is organized into five sections. The next section gives an overview of climate change and the gender and institutional context in Bangladesh. The third section presents the key study findings and is divided into three subsections: site- and household-specific vulnerabilities; analysis of gender dimensions of climate change using the household data and four propositions; and description of institutional challenges and gaps in supporting the resilience of women and men. Section four provides examples of adaptation programs in Bangladesh, and section five provides recommendations for enhancing gender-responsive adaptive capacity in Bangladesh.

2. Overview of Climate Change, Social and Institutional Context

Bangladesh is recognized as one of the countries most vulnerable to climate risk. Its high vulnerability is due to a number of hydrogeological and socioeconomic factors such as: (i) geographical location—Bangladesh is the lowest lying riparian country with three large rivers and drains over 92 percent of the total annual flow of the river system; (ii) a flat, deltaic topography with very low elevation—about two-thirds of the country is less than 5 meters above sea level; (iii) extreme climate variability—heavy rains during monsoon season and drought conditions in winter; (iv) high population density and poverty; and (v) agriculture as the main livelihood, which is significantly affected by climate variability and change (Ahmed 2006).

The median predictions indicate higher vulnerability. Predictions indicate that Bangladesh will be 1.5°C warmer and 4 percent wetter by the 2050s (World Bank 2010b). This warmer and wetter future climate will exacerbate existing climatic risks and increase the extent and depth of inundation from flooding and storm surges and by reducing arable land due to sea level rise and salinity intrusion. The IPCC Fourth Assessment (IPCC 2007) projected an increase in sea level rise of between 18 and 59 cm by 2100. Assuming a sea level rise of 27 cm by 2050, approximately 18 percent of Bangladesh could be inundated, affecting 33 million people (World Bank 2010b). Severe cyclones originating in the Bay of Bengal are expected to occur more frequently as a result of warmer ocean surface temperatures; floods, land erosion, droughts, salinity, water-logging, and drainage congestion are expected to increase in severity and frequency (World Bank 2010b).

The frequency and intensity of natural disasters has increased in recent years. The annual frequency of natural disasters has increased since 1985, from 6.11 per year (1970–98) to 8.07 per year (1985–98) (UNDP 2001). The national poverty level declined rapidly during the last decade, from nearly 50 percent in 2000 to 31.5 percent in 2010 (GoB 2011). While there are still high levels of poverty in climate-vulnerable areas (nearly 50 percent), disaster preparedness, recovery efforts, and institutional support helped reduce community sensitivity to risks, as well as the number of deaths.

Progress and challenges toward gender equality in Bangladesh. Bangladesh is widely regarded as a positive outlier among developing countries, because despite high levels of poverty, frequent natural disasters and weak governance, it has made substantial progress toward the Millennium Development Goals (MDGs) for education, infant and child mortality, and gender parity in primary and secondary education (World Bank 2010a). Women's economic opportunities are also increasing, especially in the urban areas in garment and other export-oriented industries. Women also work in large numbers in road construction and maintenance, social forestry and in the trading and service sectors, but because women have low levels of education and skills, they usually get low paid jobs and the gender gap in wages is substantial (ILO 2008). Gender-based shifts in economic opportunities, women's mobility outside the home, and income are slowly changing family and social norms. Microfinance services (loans and credit) reach about 65 percent of the poor, the majority of whom are women (USAID 2010). However, second-generation challenges remain; young and educated women are more gender aware, but do not have better access to resources or opportunities or more decision-making power than older women (World Bank 2008b).

Achievements and limitations of institutions supporting disaster risk management (DRM), climate change, and gender equality. The government has a unitary system with a two-tiered civil

administrative structure and a top-down decision making process in most of its ministries, departments, and agencies (MDAs). The MDAs responsible for climate change, disaster management, and gender equality are the Ministry of Environment and Forest (MoEF), the Ministry of Food and Disaster Management (MFDM), and the Ministry of Women Affairs (MWCA), respectively. The DRM system, established in the 1990s with national-local level and horizontal-vertical linkages, has been effective in disaster preparedness. A climate change organizational framework was established in 2009, but limited to national-level ministries, and it is not clear how adaptation support will be coordinated with DRM or local-level institutions and communities. MWCA has officials at the upazila level (subdistrict), but lacks technical capacity to support gender-responsive adaptation programs.

3. Study Findings on Households, Gender Dimensions, and Institutions

In this section, details of the study findings are provided in three subsections: (i) site- and household-specific exposure and impacts; (ii) the gender dimensions of climate change, using the four propositions; and (iii) the review of institutional adaptation support to communities and gaps. While other studies highlighted similar issues, this study used household quantitative and qualitative data to either support or contradict the propositions derived from global literature.

3.1 Changing Climate Variability and Vulnerability of Households

Exposure of survey sites to multiple hazards shows climate variability is increasing. The survey findings indicate that all hotspots are exposed to at least two hazards annually; the largest hazard is identified as primary, and next largest as secondary. The impacts on sites vary due to differences in exposures to hazards, assets, economic opportunities, and the adaptive capacity of households (table 1).

Table 1. Community Perception on Level of Exposure to Hazard Risks and Related Vulnerability in Surveyed Sites

Hotspot	Hazard	Exposure risk	Vulnerability
NETROKONA	Flood	Medium	High
	Drought	Medium	Low
RAJSHAHI	Drought	High	Moderate
	Flood	Low	Low
GAIBANDHA	Flood	Very high	Very high for women
	Land erosion	Very high	Very high
COX'S BAZAAR	Tidal surge	Medium	High for women
	Cyclone	Low	Low
BARGUNA	Cyclone	High	High
	Storm surge	Medium	Moderate
RANGAMATI	Land slide	High	Low
DHAKA	Drainage congestion	Very high	Low
CHITTAGONG	Sea level rise	Low exposure	Moderate
KHULNA	Salinity/water-logging	High	Moderate
COMILLA (CONTROL)	Flood	Low	Low
	Drought	Low	Low

Source: Author's compilation from qualitative field work. **Note:** * Red indicates high level of risk and vulnerability.

Households are vulnerable to climate change-induced multiple hazards. Gaibandha suffers a very high exposure risk to both the primary hazard of river flood and secondary hazard of land erosion, resulting in a high level of vulnerability for households. The surveyed area used to be flood prone, but in recent years land erosion has become more frequent and intense, and has devastated the local population. Respondents consider themselves highly vulnerable: their livelihoods depend on natural resources, they have limited options for diversifying their livelihoods, have low levels of assets, and little capacity to transform their asset into income. The coastal areas (Cox's Bazaar and Barguna) also face high risk, because the frequency and intensity of tidal surges have increased, and they are not able to regenerate their natural assets and recover their livelihoods. Rangamati faces a high-risk hazard (landslides), but has lower vulnerability because people have diversified income sources in agriculture and the service sector. In all areas, women participants stressed their higher level of vulnerability due to their limited education, few assets and limited economic opportunities and information, and therefore they have less capacity to

cope with hazards. Respondents from Dhaka city feel they live in a highly exposed area, but their vulnerability is low because they have income and diversified economic opportunities. As expected, the control area (Comilla) is a low-risk zone and households have low vulnerability.

The dynamic and changing nature of climate variability is posing new threats to populations. The study findings show that most of the vulnerable areas are at risk of multiple hazards (primary and emerging secondary hazards) annually, and that these are increasing in intensity and frequency. The secondary hazards pose a completely different threat to lives and livelihoods, and the traditional adaptive mechanisms that people used for the primary hazards are failing to cope with new ones because they have limited knowledge and ability to respond to the newer hazards. For example, in the drought-prone areas of Rajshahi, flooding is emerging as a major hazard, posing an opposite threat. In Gaibandha, the secondary hazard of land erosion has become the primary hazard, and communities are not able to cope.

Local hazards due to climate change are on the increase and are having a major impact on affected population, but are not attracting national attention. The majority of respondents reported that the intensity and severity of localized climatic hazards such as all types of floods, land erosion, drought, and tidal surge have increased over the last decade. These local hazards affect smaller areas, but have a major impact on the population. For example, households that experience land erosion can become pauperized within a few days. Similarly, flash, seasonal, and tidal floods or drought affect smaller numbers of people, but agriculture, livelihood, and asset losses of these populations can be enormous. These local hazards do not usually attract the attention of national government, and the affected communities do not receive recovery support.

Households affected by local hazards are taking extreme coping actions that can lead to long-term and intergenerational vulnerability. Households suffering from multiple hazards annually are not able to recover and restore their livelihood, and as a result, are resorting to severe measures such as early marriage for girls and boys, selling land and other assets, withdrawing children from school to work, and reducing food consumption. These extreme coping measures can lead to declines in human capital and household assets, and result in long-term and intergenerational vulnerability.

Social capital is weakening in climate-vulnerable areas. The findings indicate that the impacts of incremental climate change—that is, drought, salinity intrusion, and land erosion—are decreasing social capital and increasing conflicts over scarce natural resources. Field data reveal incidences of conflict over water and fuelwood in drought and saline prone areas, and women are facing increased external violence because they usually collect these resources. On the other hand, data also indicate high levels of social capital and collective action before and after major disasters (cyclone, flash floods) as people from different social and income groups come together to repair roads, embankments, and tube wells. This indicates that while major disasters promote cohesion and collective actions, incremental climate change has the opposite effect among the population.

3.2 The Gender Dimensions of Climate Change: Four Key Propositions

The four key propositions were derived from global experiences and analytical frameworks and are used here to analyze the gender dimension of climate change, using household quantitative data.

Proposition 1: Vulnerability to hazards is gendered

The survey results from both rural and urban areas support that *vulnerability to climate change is gendered* because women are disproportionately vulnerable to natural hazards due to social norms, entrenched gender inequality and reproductive responsibilities, all of which constrain their mobility and survival options. Field data further indicate that women also face specific difficulties due to climate variability such as lack of sanitation facilities, because of their fuel and water collection responsibilities for their families, and from increased external and domestic violence. The details from survey findings are presented below.

Social norms and family responsibility reduce women's survival chances in rapid-onset climate events. Women respondents indicated that they are reluctant to use shelters because it is difficult to leave their homes and/or stay in a shelter without a male relative. *Sarees*, women's traditional clothing, and long hair can easily become entangled and limit women's ability to escape during an emergency. In addition, most women carry one or two small children and food for survival when they are fleeing hazard areas, and these responsibilities slow their escape. All of these factors seriously limit their ability to survive cyclones and storm surges, and as a result, women perish in natural disasters in disproportionate numbers.

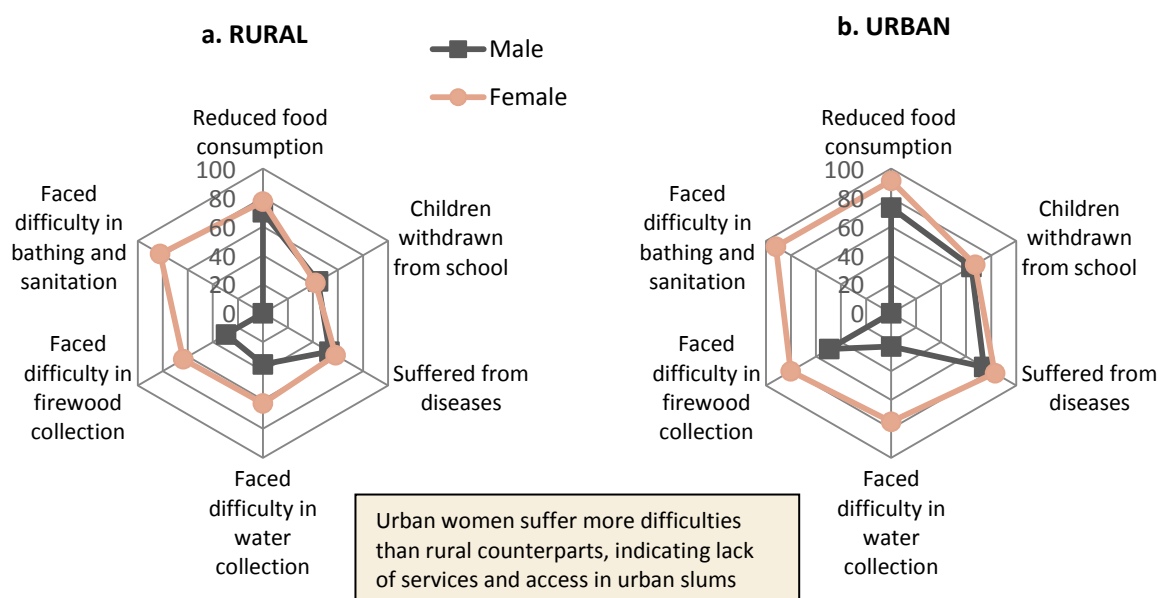
Social norms regarding women's responsibilities shape their vulnerability to climate change. The study findings reveal that women in almost all households are responsible for managing the household, including water and fuel provisioning, cooking, cleaning, and caring for children, the sick, and the elderly. The field data further indicate that because climate change has increased salinity and drought in some areas, fresh water and firewood are in short supply, and as these natural resources disappear, women have to walk longer distances to collect them, risking their health and safety in the process. Urban women do not have easier access to water and firewood, rather these tasks are as labor intensive and time consuming as in rural areas, and impact on women's livelihood and income options. More men are involved in fuel collection in urban areas than in rural areas. Women noted that the increased time for managing domestic responsibilities reduced their time for other activities, such as economic productivity and income earning, networking, skill development, information gathering, and community activities.

Difficulties in sanitation and bathing make women more vulnerable to illness. It is striking that gender-based differences in impacts such as difficulty in sanitation and bathing during and after disasters, water and fuelwood collection, and increased violence are virtually the same in rural and urban areas (figure 1). During and after disasters, women face the added difficulty of finding bathing and sanitation facilities: nearly 70 percent of rural women face difficulty in bathing and sanitation, while it is nearly 100 percent for urban women. Men reported facing no difficulties in this area. Women are also confronted with lack of privacy when bathing and sanitation facilities are destroyed by disasters. Because of the lack of private bathing and toileting facilities, many women develop urinary tract infections. The majority of women from all income groups, in rural and urban areas, face sanitation and bathing difficulties during hazards; but urban women reported having more difficulty with these issues than women in rural areas.

Inheritance laws affect women's vulnerability and adaptive capacity. The respondents noted that many women and girls lost access to property after their father or husbands died in the cyclone Sidr due to inheritance and personal laws, lack of information about legal rights, and/or inability to access the justice system. The effect, when combined with lost assets, was that women had no collateral and their ability to

access loans from the formal banking system to enhance their economic opportunities and income was limited. Women from Hindu communities do not inherit their parent's property, rather they receive dowry/gifts at the time of their marriage in the form of money, assets and jewelry, which are not in their names. In personal laws, Muslim women can inherit the property of their husband or father, but their inheritance is half that of brothers and children, who inherit together. Usually women give their inheritance to their brothers, so as to remain on good terms and to be able to visit the parental home. In cases of divorce or abandonment, women do not have joint property rights and have to seek shelter with brothers.

Figure 1. Women Face Greater Difficulties Than Men during and after Disasters in Rural and Urban Areas (%)



Source: Author's illustration, based on data from quantitative survey conducted for the study by Bangladesh Institution of Development Studies (BIDS).

Note: Rural sample size for panel a: 420 women and 420 men; Urban sample size for panel b: 180 women and 180 men.

Coping actions, conditioned by social factors, perpetuate vulnerability. Many poor families in climate-vulnerable areas marry off their daughters and sons at a young age to cope with the impacts of climate change. The girls' parents want to ensure their security and reduce household expenses, dowries are less for young girls, and the grooms' families want the benefit of the dowry. While this practice is considered to be a form of coping, the young bride is likely to have limited education opportunities, become pregnant early, suffer from poor maternal health, and be more vulnerable in general and to climate change hazards.

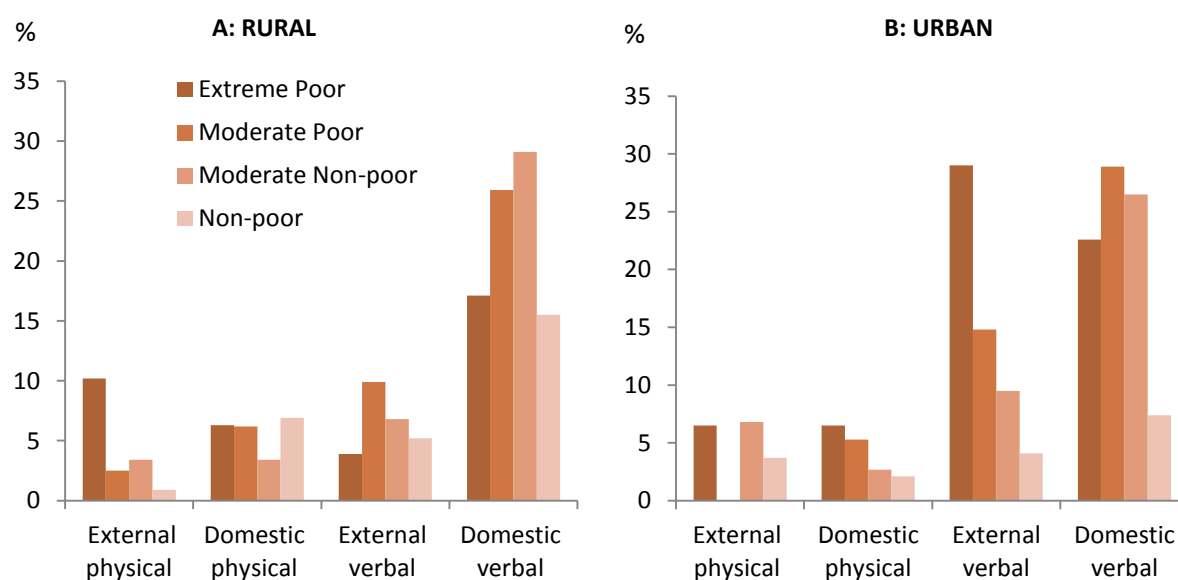
Extreme coping actions are gendered and can have long-term impacts. In all households, both poor and nonpoor, food consumption is reduced during and after disasters, but women reduce more than men. This can increase malnutrition and have a negative health impacts in the long run. Households also withdraw children from school; more boys than girls are withdrawn by poor households, which can lead to a further reduction in endowments and increased vulnerability in the long run. Just over 40 percent of

rural households and 85 percent of urban households withdrew children from school during disasters; both boys and girls were withdrawn temporarily and permanently across all income groups. Rural households withdraw more children permanently; urban households more temporarily (figure 1).

Vulnerability differs by income groups. Among income groups, the nonpoor group has the highest level of adaptive capacity, as determined by their asset base, transformative capacity and income, and hence are the least vulnerable. Women from the extremely poor group have the lowest asset base, and the least adaptive capacity, and are the most vulnerable. The asset base and adaptive capacity of the moderately poor and moderately nonpoor are low and their vulnerability high; both may fall into poverty due to climate change.

Managing scarcity exposes women to increased levels of abuse and violence. Lack of employment, income, and resources during and after hazards can increase tensions in households and lead to domestic abuse. Competition exists between communities, households, and individuals for scarce resources, and women face more external violence while collecting water and fuel. Both qualitative and quantitative findings indicate women and girls experience increased levels of violence during and after hazards. Women from middle-income groups in both urban and rural areas faced the highest increase in verbal abuse in the home (around 30 percent); women from extremely poor households faced increased levels of external physical violence in both areas (10 percent; figure 2). Women from middle-income groups usually have to abide by the social norms and family honor, have limited economic options because they are not allowed to take “inappropriate” jobs by their families, and be self-reliant. The most prevalent form of abuse in urban areas, external verbal abuse (30 percent), was directed at women in the poorest income group, pointing out the extra danger they are exposed to when working outside the home.

Figure 2. Both Rural and Urban Women Face Increased Violence, But It Is Higher in Urban Areas



While poor women face higher external violence, those from the middle-income group face the highest increase in domestic abuse.

Source: Author's illustration, based on data from quantitative survey conducted for the study BIDS.

Note: Rural sample size for panel a: 420 women; urban sample size for panel b: 180 women.

Losses due to hazards are gendered. Respondents said they suffered the highest losses from land erosion. The next largest loss was in livelihoods in the coastal areas due to storm surges (cyclone Sidr and others) and flash floods. Households also lose income through lost workdays. Women and men in rural areas lost many more workdays than those in urban areas (45 days for men compared to 10–20 days and 15 days for women compared to 8). These figures suggest that those migrating to urban areas are less vulnerable to climate hazards because their livelihoods are less dependent on natural resources. Men lose a greater number of workdays than women because in rural households they are the main earners. The highest workday loss for men is due to different types of floods, followed by water-logging. Women lost the highest number of workdays due to cyclones (54 days); men lost 28 days, a much lower number because they were able to find employment in rehabilitation work after the cyclone, women were not able to access these jobs.

Work pressures undermine childcare during hazards. In urban areas, where there are many more women earning an income, women explained that during climatic events they have to work in unfavorable conditions. To keep their jobs in garment factories or as domestic laborers, they must show up for work in the immediate aftermath of the event; if they do not, they lose wages. This creates problems with childcare, and children end up being left at home unsupervised during school closures.

Proposition 2: Adaptive capacity is gendered and shaped by control over endowments, opportunities, and agency

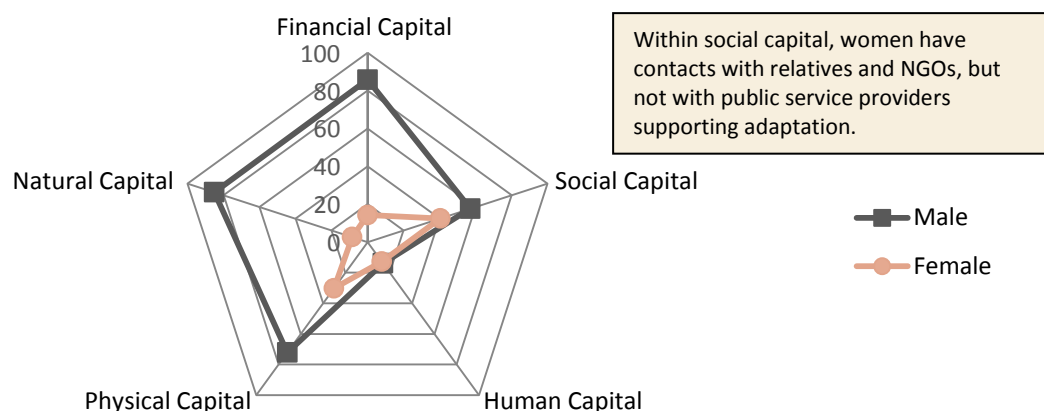
Household data also substantiate that *adaptive capacity* is gendered because women have less control over capitals, limited economic opportunities and limited voice in decision making, and these factors reduce women's capacity to adapt and overcome hazards. Furthermore, the burden of household care, low education levels, limited opportunities for skill development, and sex segregation in the workforce reduce economic opportunities for women, especially in rural areas, where only 18 percent adult women earn an income. Climate-induced scarcity of natural resources further increases women's workload and reduces time for income generation and networking. The following sections provide details of household findings.

Successful adaptation strategies at the individual, household, and community levels depend on levels of assets and the ability to transform assets into incomes. There is a distinct difference between people having assets and having the ability to transform these into incomes. The survey responses in all hotspots revealed that nonpoor households are better able to transform their natural capital into financial and physical capital for increased income than poorer households. Data indicate that nonpoor households are diversifying their livelihoods by establishing enterprises or businesses or educating their children so they can get employment in the service sector. Adaptive capacity for climate change is gendered because it is shaped by women's unequal control over resources and endowments, their inability to transform one asset into another, and the unequal burden of care.

Rural women, from all income groups, have less control than men over all types of capital (human, social, natural, physical, and financial). Because women have less control, they are not able to transform capital into livelihoods and incomes, especially to climate-resilient incomes (figure 3). None of the surveyed women had title to land. Also, women have limited ownership and decision-making authority over livestock and poultry. Men control physical capital such as equipment and machinery, limiting women's productivity. Women lack financial capital; men have decision-making authority over

household income, loan utilization, and expenditures. Both women and men have low levels of education, but women have the additional restriction on mobility, which limits their access to extension staff and training opportunities. Neither men nor women are able to translate education into higher income. Combined, these factors lead to a lack agency and lack of choice for women from all income groups, and less individual adaptive capacity and higher vulnerability than men.

Figure 3. Women Have Limited Control over Capital



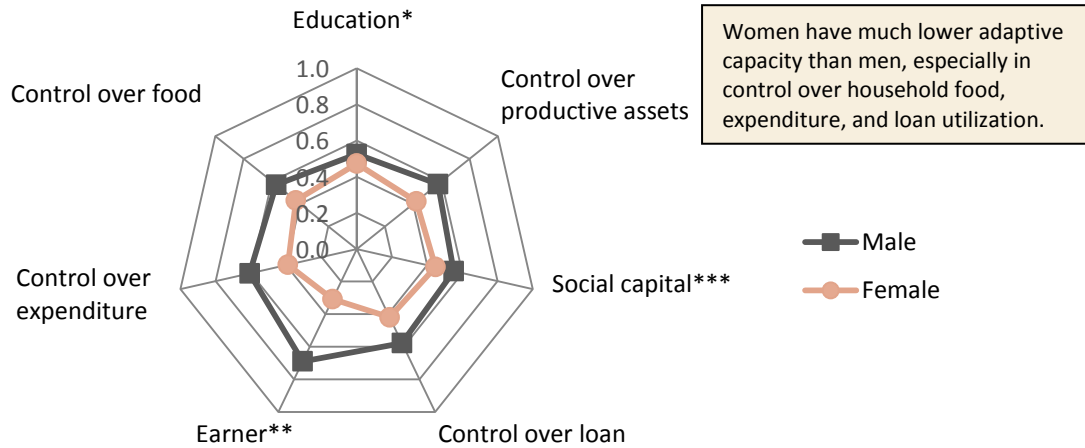
Source: Author's illustration, based on data from quantitative survey conducted for the study by BIDS.

Note: Sample size: 420 women and 420 men.

Women's limited ability to transform capital reduces their adaptive capacity. Even in rich and middle-income households, women's ability to transform natural capital into human capital by taking part in higher education and training outside their village is limited because of social norms (figure 4). Because it is often socially unacceptable for them to take up employment, their human capital cannot be transformed into financial capital with the same efficiency as men's capital. This is particularly evident in the conservative cyclone- and tidal flood-prone hotspots. While many women in the nonpoor/rich households in drought-, river flood-, flash flood-, and cyclone-prone hotspots are educated, few of them are involved in income generation, but rather follow traditional gender roles. In addition, few economic opportunities exist in these areas, which limit the potential for educated women to earn an income and improve their adaptive capacity.

Restricted access to markets and institutions limits opportunities for women. Less than 10 percent of rural women have access to markets. Despite having social networks of their own and more interaction with NGOs than men, they have less access to formal institutions, and what access they do have is mostly through men. This limits their access to public institutions, adaptation support and information, which are key pathways to empowerment. All of these limitations reduce women's ability either to cope in the face of disaster, or to adapt to long-term climate change, making them more vulnerable than men. Data also indicate that the gender differences in adaptive capacity remain almost the same across income groups.

Figure 4. Gender Differences in Adaptive Capacity Are High in Rural Areas

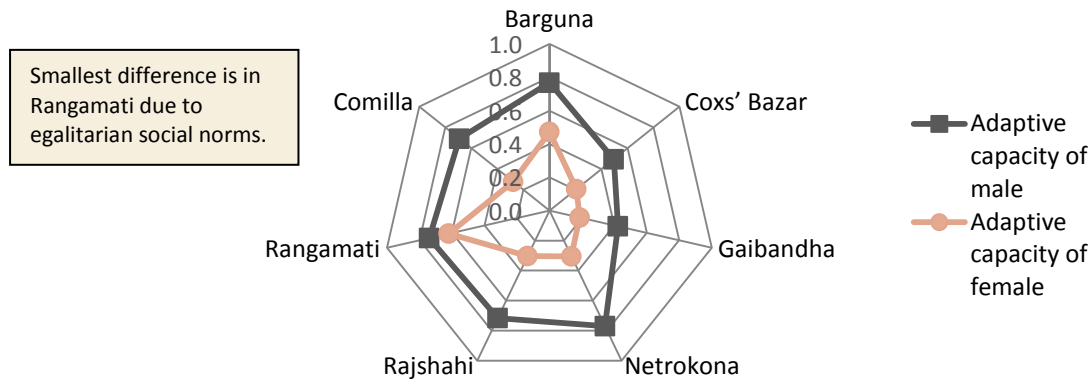


Source: Author's illustration, based on data from quantitative survey conducted for the study by BIDS.

Note: Sample size – 420 women and 420 men. * Education = average years of schooling; ** earner = number of earning members divided by the household size; *** social capital = support and contacts with formal and informal institutions.

Egalitarian norms strengthen the adaptive capacity of women. The adaptive capacity of women and men is closest in Rangamati, and the gender gap most acute in Rajshahi and Netrokona (figure 5). Indigenous women from Rangamati have equal access to land/farming and the market and are able to bargain directly with customers to earn higher profits, rather than selling their produce through middle men. As a result of egalitarian traditional norms, women of Rangamati are able to transform natural capital assets into economic opportunities and incomes, and are less vulnerable to climate change.

Figure 5. Gender Differences in Adaptive Capacity by Sites



Source: Author's illustration, based on data from quantitative survey conducted for the study by BIDS.

Note: Sample size: 420 women and 420 men.

Proposition 3: Migration as an adaptive strategy is gendered

Migration to urban areas is important for many rural households. Data from this study indicate that migration to urban areas is important for both the poor and nonpoor, and for both women and men. Over the last decade, approximately 43 percent of households had members who migrated. Of those households reporting migration, only 6 percent had members who migrated permanently, and over 60 percent migrated for livelihood reasons, while 14 percent migrated because of climatic hazards. In the

past decade, more men than women (77 percent compared to 23 percent) have migrated from all the study areas. One notable change during the same period is the large number of young single women migrating to urban centers. The majority of women migrate irregularly (63.5 percent), followed by daily/weekly and seasonal (both 11.5 percent) migration. The majority of men migrate irregularly (60.3 percent), followed by daily/weekly (18.4 percent) and seasonal (16.1 percent). Of those who migrated permanently, 11.5 percent were women and 4.6 percent men.

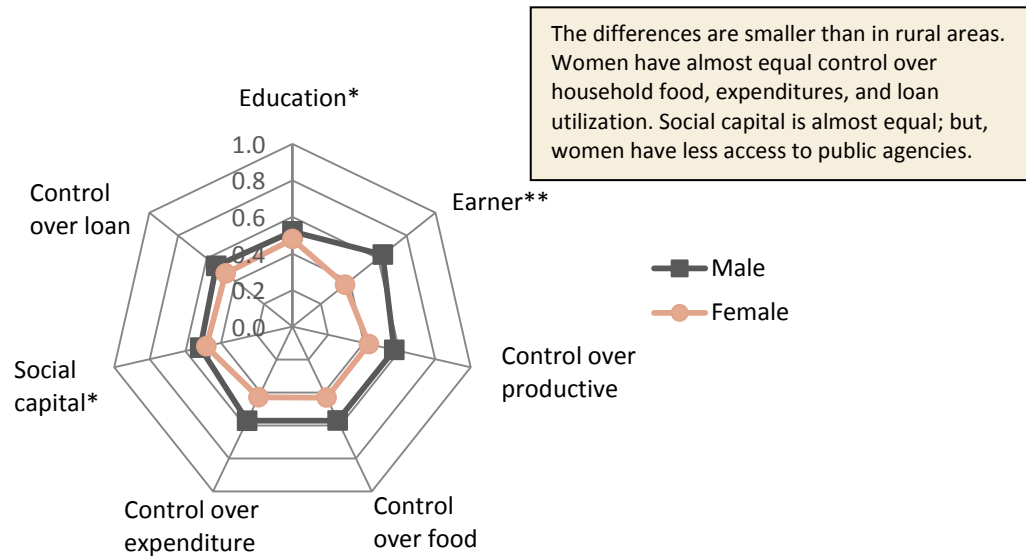
Urban areas offer women diverse economic opportunities that can enhance adaptive capacity. This study found that in urban areas, migrants, especially women, have greater access to economic opportunities and markets compared to rural areas. Whereas men have economic opportunities in both urban and rural areas, women have fewer options in rural areas, where work is predominantly agricultural labor. However, the range of opportunities for both women and men is limited by poor education and illiteracy. Despite this, migrants' earning capacity increases in urban areas, therefore increasing their potential to acquire assets and capital.

Women's mobility opens opportunities. Almost half of the women migrating did so in search of better livelihoods. In urban areas, women have numerous opportunities (economic, social, legal) that can improve their welfare and facilitate empowerment—and increase adaptive capacity. Urban women are less socially constrained; they enjoy greater mobility, freedom in choosing a husband and access to information, especially about their own rights. They also have more institutional contacts. All of these factors make them more self-reliant, independent, and empowered.

Urban areas provide greater access to services. Urban migrants have access to more amenities such as electricity, transport, schools, colleges and electronic devices as well as health care services than rural residents. While these services and amenities can improve the quality of life, they also significantly increase the cost of living, and given that the majority of women migrants are from poor and extremely poor rural households, they are unable to access these services. Women from wealthier rural households often give children's education as their reason for leaving the rural area.

Women in the urban areas have more adaptive capacity and are less vulnerable. The surveyed urban women had an adaptive capacity much closer, but not equal to, men, because they have access to economic opportunities, are earning an income, and have more freedom and decision-making power within the household. As a result, these women have better adaptive capacity and are less vulnerable than their rural counterparts (figure 6).

Figure 6. Gender Differences in Adaptive Capacity Are Low in Urban Areas



Source: Author's illustration, based on data from quantitative survey conducted for the study by BIDS.

Note: Sample size – 180 women and 180 men. *Education = average years of schooling; **earner = number of earning members divided by the household size; ***social capital = support and contacts with formal and informal institutions.

Women migrants face difficulties. Many poor women migrants without social networks are vulnerable to violence (figure 2). There are also various pressures and stresses that migrants have to face including poverty, joblessness, and changing social norms. Often women migrants, particularly those who are poor and low skilled, are limited to work in the informal sector where wages are low and service conditions are poor.

Sometimes women migrants marry for security. Polygamy is more common in urban areas than rural areas. Men marry for dowry and the income of the women they marry; they can increase their economic viability by taking on multiple wives. Women in turn have to marry for security; because marriage can help them to live more socially secure lives, they often agree to become co-wives.

The poor may remain trapped in climate-vulnerable areas. Field data indicate that poor migrants are not able to escape climate variability because they live in city slums that are located in low-lying areas and continue to face regular hazards. They also lack utilities and services and live in unhygienic conditions. Urban land is expensive; therefore, since they plan to return to home, many buy land and other assets in their villages, perhaps trapping them in a life vulnerable to climate variability with limited options.

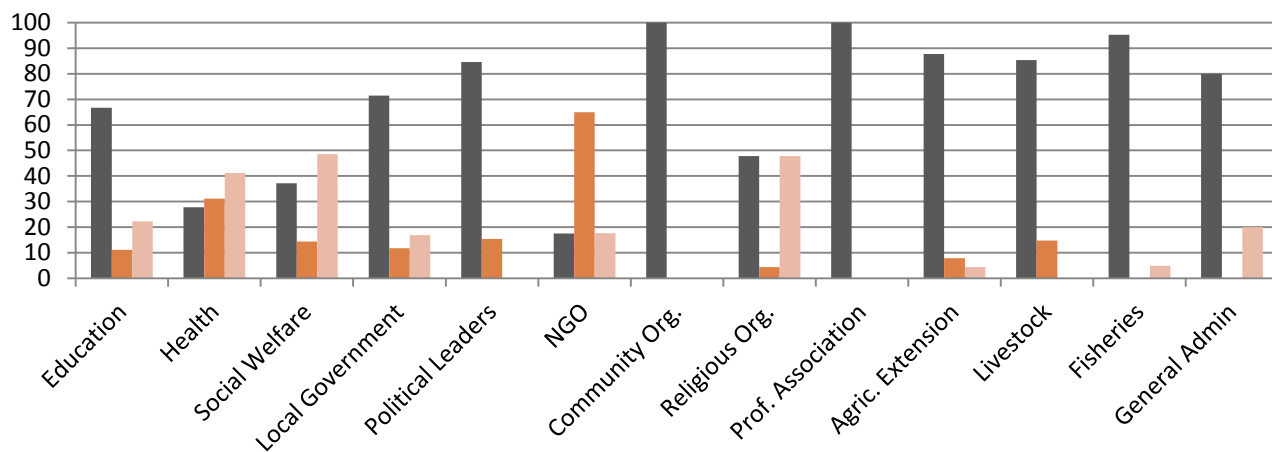
Proposition 4: Access to institutions that can help build resilience is gendered

Households, particularly in urban areas, express low satisfaction with institutional support. Though the majority of households contact institutions after hazards, their satisfaction levels vary. The highest number of institutional contacts by rural households was with social welfare and local government (92 percent), followed by community based organizations/NGOs/professional associations (86–88 percent), health and political leaders (85 percent), and agriculture extension (70 percent). Respondents were satisfied with the services and support of the general administration (60 percent), women affairs (50 percent), religious organizations (43 percent), NGOs (30 percent), and local government (28 percent). In urban areas, the majority of households contacted professional associations, social welfare and religious

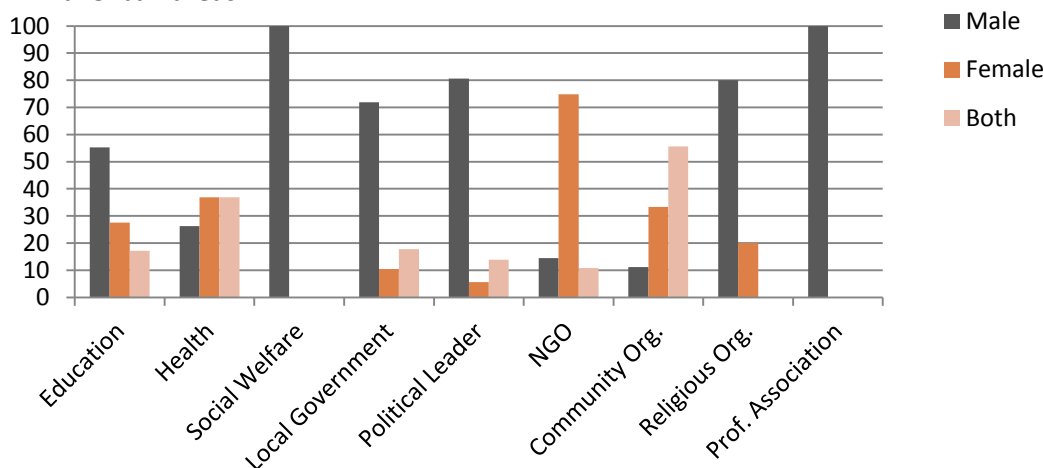
organizations (100 percent), followed by health (99 percent), NGOs (95 percent), community organizations (91 percent), political leaders (87 percent), and local government (86 percent). Satisfaction was low with most institutions, 33 percent for Social Welfare, 31 percent for NGOs, and 12.5 percent for local government. Women's access to public sector service providers is very low, around 10 percent.

Figure 7. Gender Differences in Institutional Contacts in Rural and Urban Areas during the Last Major Disaster (%)

a. Rural areas



b. Urban areas



Source: Author's illustration, based on data from quantitative survey conducted for the study by BIDS.

Note: Sample size: rural, panel a = 420 women and 420 men; urban, panel b = 180 women and 180 men.

Low institutional contact by women reduces their adaptive capacity. In both rural and urban areas, men are the primary contact with all public institutions supporting DRM and climate change, while women are the primary contacts with NGOs (60 percent). It is important to note that women have very low (below 10 percent) contact with all institutions, especially those that can help in recovery and adaptation, for example, extension services and local government in rural areas and professional associations, local government, and political leaders in urban areas (figure 7). Women and men are in contact with health agencies in almost equal numbers in rural areas, but urban women are more so than men, and surprisingly women have low contact with educational authorities in both areas.

Institutional access, especially for information and training, is important to help women emerge as change agents. Institutional support places women in the forefront of disaster preparedness. In disaster forecasting, women now make the announcements over bullhorns and radio. Large numbers of young women are trained as volunteers to take women and children to shelters and provide support. As a result of these women-led activities, more women are going to shelters and the number of victims in disasters has been drastically reduced. In the 1991 cyclone, over 140,000 people died and the ratio of male to female deaths was reported to be 1:14; in the 2007 cyclone, the number of deaths and ratio were reduced to around 3,000 and 1:5, respectively. The decrease in the number of deaths and the male to female ratio is attributed to the active engagement of women in disaster management as well as the construction of many shelters in the coastal areas.

Women are developing innovative adaptation practices. Findings show that women are disseminating information using their social networks and, in both rural and urban areas, are adopting innovative adaptation practices, such as floating hyacinth beds to plant seeds during high floods, so as to not lose the replanting season. Similarly, they plant seeds in large pots and tie these to trees during floods. They mobilize and store seeds and grains in communal and individual facilities to preserve them during disasters. Such experiences in adapting to climate risk are helping to develop broader actions within communities.

3.3 Institutional Constraints and Gaps Limit Adaptation Support

Potential duplication and lack of clarification of roles and responsibilities between DRM and climate change systems limit adaptation support. The DRM system covers national and local levels with both horizontal and vertical links and includes disaster management committees at each tier of local government. All committees are chaired by elected local government leaders and include members of civil administration and civil society. An organizational structure has also been established to respond to climate change, but it parallels the DRM structure at the national level. The relationship and coordination between DRM and climate change organizational structures is not clear; therefore, duplication and inefficient use of resources is likely and will detract from adaptation support.

The climate change structure's ability to respond to community adaptation is weak. This structure is limited to national-level ministries and has no links with meso- and local-level institutions. It is not clear how capacity support and resources associated with the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) will be coordinated with local-level institutions—the village, union, and upazila. Because there is no arrangement to consult local institutions and vulnerable communities, the development of need-based climate change adaptation programs and actions will be limited and unlikely to yield the necessary outcomes.

Top-down, centralized decision making and poor coordination limit adaptation support to communities. Project planning, budget allocations, and overall disaster management and adaptation decision making are conducted at the central level of government and passed down. These central-level planning processes pay limited attention to the differential needs and demands of local women and men, and to the impacts of local hazards. Thus, top-down, often gender-blind approaches also debilitate meso-level civil administration because they cannot change approved programs to support needs arising from disasters and climate change. There is also a lack of coordination between the different gender equality,

DRM and climate change agencies, other government bodies (both vertical and horizontal), NGOs and community-based institutions, and as a result, a comprehensive approach has not emerged yet.

Local governments have poor capacity and limited funds and authority. The disaster management committees at different levels of government have not been given authority in climate change adaptation. The union and upazila parishad functionaries are knowledgeable and willing to work on climate change, but are not given funds and capacity support. The representatives of urban local government institutions are less knowledgeable. In addition, services are poor or absent during and after disasters. The lack of participation of various government departments—particularly health, water supply, social welfare, agriculture, and family planning—lessens the ability of local communities to adapt to climate change.

Levels of preparedness for gender-responsive climate change programs are low. MWCA, with Women in Development (WID) focal points, is often unable to mainstream and/or monitor gender equality progress due to a lack of staff and technical capacity. There is no gender strategy or action plan for climate change outlining prioritized gender entry points with set indicators for tracking, nor is there a budget. Government officials, at all levels (national, meso, and local), have varied but generally low levels of gender awareness; without a strategy, action plan, and budget, they will not be able to implement gender-responsive adaptation programs.

MWCA is often unable to make its presence felt, even when included. While the foundations for a WID architecture are in place, with the WID focal points as the technical and policy conduits through which gender mainstreaming can be enhanced in other agencies, the focal points have not been able to make their presence felt. Women elected to most of local government institutes have limited decision-making responsibility and/or inadequately budgeted programs, and therefore are not able to undertake or support gender-responsive programs.

4. Examples of Gender-Responsive Adaption in Bangladesh

The government of Bangladesh (GoB) has put in place an extensive set of hazard risk-mitigation measures—both structural and nonstructural—that have enhanced its disaster preparedness. Government, development partners, and NGOs are also implementing pilot adaptation programs, with various results. These pilots can provide lessons for developing gender-responsive program to reduce the vulnerability of women and men in climate-vulnerable areas.

Pilot disaster management and adaptation programs provide useful lessons. Three programs, supported by donors and implemented by NGOs, provide lessons for the Bangladesh adaptation agenda: the *Comprehensive Disaster Management Programme (CDMP) Phase I & II*; *Reducing Vulnerability through Climate Change (RVCC)*; and the *Char Livelihoods Programme (CLP)*. These pilots aimed to reduce community vulnerability to natural hazards. *CDMP-I*, supported by the United Nations Development Programme (UNDP), implemented 480 community risk-reduction projects that benefited 600,000 people. Under *CDMP-II*, this support will be expanded to 32 districts and urban areas. *RVCC* was implemented by CARE in 2001 in southwestern coastal areas, with support from the Canadian International Development Agency. The project supported 14 union parishads (UPs) to develop three-year development plans for sensitivity reduction and adaptation that included actions to address water-logging and salinity, drainage congestion, greenbelt in coastal areas, and the promotion of rainwater harvesting and access to potable water. *CLP* is funded by the United Kingdom Department for International Development (DFID), sponsored by the Rural Development and Co-operative Division of the Ministry of Local Government, Rural Development, and Co-operatives (MoLGRD&C), and implemented by NGOs. *CLP-I* aimed to improve the livelihood security of communities living in the *char* areas of five northern districts and provided: (i) water and sanitation facilities and health services; (ii) sensitivity-reducing measures such as raising homesteads and shelters for livestock; and (iii) income-generating assets accompanied by training. These interventions are being expanded under *CLP-II*.

The World Bank is supporting programs for reducing community sensitivity, as well as for enhancing adaptation. The Bank has been supporting Bangladesh in both structural and nonstructural programs that have reduced community sensitivity to hazards while developing adaptive capacity. The ongoing programs are: the *Emergency 2007 Cyclone Recovery Project (ECRP)*; the *Social Investment Program Project (SIPP-I & II)*; the *Local Governance Support project (LGSP-I & II)*; the *Northern Areas Reduction of Poverty Initiative (NARI)*; and the *Community Climate Change Project (CCCP)*. *ECRP* is being implemented by the Local Government Engineering Department (LGED) and supports the construction and rehabilitation of gender-friendly, multipurpose cyclone shelters in the coastal areas. *SIPP-I*, implemented by the Social Development Foundation (SDF), was piloted in two climate-vulnerable districts and supported community infrastructure subprojects such as road, culvert, and drainage construction and rehabilitation; social forestry; and flood shelters for livestock and poultry. These subprojects were implemented by the gender communities and helped reduce their sensitivity to climate variability. *SIPP-II* (Notun Jibon) is expanding successful lessons from *SIPP-I* to other parts of Bangladesh. *LGSP I* provided grants to 4,505 rural local governments (UPs). Communities, led by UP functionaries, implemented subprojects for reducing community sensitivity to climate risks and for enhancing their adaptive capacity—such as safe drinking water and sanitation facilities, rehabilitate and maintain embankments and roads, and develop climate-resilient agriculture technologies. *LGSP-I* also promoted gender equity; women UP members were chairs of 30 percent of subprojects, and this enabled them to manage local development process in a

participatory manner, and promoted women's empowerment. LGSP-II will expand this process by supporting the Upazila Women Leaders Forum, consisting of UP women members and Upazila Vice Chair for peer learning and joint activities. *NARI* aims to improve the adaptive capacity of poor women from climate-vulnerable areas by improving their access to skill development and employment opportunities in the formal garment sector. *CCCP* will be implemented by the Palli Karma-Sahayak Foundation and their partner organizations (NGOs) and aims to enhance the adaptive capacity of selected communities to increase their resilience. Because SIPP-I & II and LGSP-I & II provide discretionary funds to communities and UPs respectively, planning and decision making are conducted by gender-balanced community groups in which women have decision-making power and therefore these groups are able to implement need-based programs to prepare for and manage local hazards.

5. Conclusion and Suggestions for Gender-Responsive Adaptation Program

Government has made preparing for climate change its highest priority. Three high-level councils, consisting of key ministries and chaired by the prime minister—the National Environment Council (NEC), the National Disaster Management Council (NDMC), and the National Council for Women’s Development (NCWD)—were established to coordinate activities related to climate change, disaster, and gender equality, respectively. The respective focal points—the MoEF, MFDM and MWCA, and their implementing arms, the Climate Change Cell at the Department of Environment (CCC/DoE), the Disaster Management Bureau (DMB), and the Department of Women Affairs (DWA)—are responsible for developing, implementing, and monitoring progress in relevant areas. Other important ministries that develop and implement programs to reduce risks to hazards and enhance the adaptive capacity of communities are the Local Government Division (LGD), the ministries of water resources (MoWR), agriculture (MoA), health (MoH), education (MoEd) and energy (MoE), and their implementing arms, the Local Government Engineering Department (LGED), the Department of Public Health Engineering (DPHE), the National Institute of Local Government (NILG), the Water Development Board (WDB), and the Department of Agriculture Extension (DEA). Policy, strategy, program, and budget decisions are made at the central (ministry) level, implemented through meso-level civil administrative units (district and upazila), and sometimes supported by local-level government institutions (union parishad, upazila parishad, pourashabha, and city corporations).

Large-scale investment in disaster management has saved lives and livelihoods. GoB put in place an extensive set of hazard risk-mitigation measures—both structural and nonstructural—that enhanced its disaster preparedness system. These measures include structural investments to *reduce community sensitivity to hazards*, such as coastal embankments/dykes, cyclone shelters, an early disaster warning system, river bank embankments, and river training and dredging, in both rural and urban areas. To improve resilience, GoB has invested over \$10 billion on disaster-prevention measures over the past 35 years. GoB also invested in large-scale research and development in climate-resilient agriculture and irrigation and water technologies, and these are helping farmers reduce sensitivity to hazards and improve agricultural productivity. Furthermore, government also invested in programs to increase *adaptive capacity*, including in human capital—health, education, and safety nets—and infrastructure such as transport, electricity, information and communication technology, and water and sanitation. The survey data indicate that all of these investments and programs have improved household connectivity and productivity, reduced mortality, and generally enhanced people’s adaptive capacity and resilience to hazards.

The study findings suggest the following recommended actions. To reduce the vulnerability of women, government can adopt targeted programs for increasing women’s endowments (education and skill development), economic opportunities (employment and credit), and empowerment (participation in decision making in adaptation program). While some adaptation programs are being implemented by national agencies, local adaptation funds and decision making can be transferred to local-level institutions and funds earmarked for projects focused on enhancing women’s adaptive capacity. Currently, 30 percent of local government leaders are women, funds should be allocated to build their leadership capacity, as well as for civil society organizations supporting women’s capacity-building

programs. A gender action plan for the BCCSAP, with activities, timelines, indicators and budgets, should be developed to strengthen the level of preparedness for gender-responsive climate change programs.

Table 2 provides specific recommendations to address the key gender and climate change issues identified in this study. The suggested actions are in three areas: (i) policies and institutions, (ii) sensitivity reduction, and (iii) adaptive capacity enhancing strategies. These suggested actions are also further prioritized according to whether they require short-term or medium-term planning and implementation.

Table 2. Suggestions for a Gender-Responsive Adaptation Program

Policy and institutional areas: short-term actions	Responsible agencies
Alignment of institutional frameworks on DRM, climate change, and gender equality can enhance coordination and synergy. The administrative structures of disaster management, climate change, and gender equality should be aligned to provide integrated support to local institutions and communities in the preparation and implementation of climate change adaptation. Alignment will enable the existing disaster management committees (DMCs) established at different levels to assume the responsibilities of gender-responsive climate change adaptation, reduce potential duplication of efforts, and create synergy between DRM, gender, and climate change adaptation. Capacity development modules on climate change adaptation need to be developed and DMCs need to be trained. Training programs need to be prioritized in climate-vulnerable areas.	NEC, NDMC
While some adaptation programs will be implemented by national agencies, local adaptation funds and decision making can be transferred to local levels. Local-level adaptation programs need to be decentralized, and local government institutes (LGIs), with DMCs at different levels, need to be given the responsibility to develop programs in consultations with communities, mobilize resources, and implement the adaptation programs. Women members of LGIs can help implement gender-responsive capacity-building and adaptation programs.	NEC, NDMC, MoEF, MWCA, MFDM/DMB, LGD, NILG
Strengthen the level of preparedness for gender-responsive climate change programs. MWCA can play a central coordinating role in assisting with the development of gender-responsive adaptation programs, capacity building of responsible agencies and DMCs, and monitoring progress. MWCA upazila-level officials can be responsible for providing technical assistance and capacity-building support to DMCs and local government functionaries, and with these bodies, monitor progress. The Upazila Resource Teams (URTs), consisting of upazila technical officials and supported by the Local Governance Support Project (LGSP), provide training to UP functionaries and communities. The MWCA upazila officials can be part of URTs to support adaptation training of UPs and communities. The URTs can also expand training to upazila, zila, pourashabha, and city corporation DMCs.	MWCA, MoEF, MFDM, DMB, LGD, NILG, URTs
A gender action plan for BCCSAP will guide implementation through a gender lens. A gender action plan for BCCSAP should be developed that prioritizes key gender entry points, indicators and annual targets, and links these with the budget process and costing exercises. Indicators are a key entry point for determining gender equality results. MWCA will support efforts to collect, use, and store gender-disaggregated data and other gender-related information. In so doing, MWCA will strengthen the accountability for gender equality results and can increase the visibility of priority gender issues in climate change policy dialogue and negotiations.	MWCA, MoEF, MFDM, DMB, LGD, NILG, URTs
MWCA capacity on gender and climate change needs to be enhanced. MWCA needs to build its own operational capacity as the gender focal point for enhancing gender-responsive adaptation programs.	MWCA, MoEF, NGOs

Policy and institutional areas: medium-term actions	
Adaptation planning and funding should incorporate migration issues into building long-term resilience. Strategic planning for urban areas should focus on the increasing challenge of climate change and the differential vulnerability of women and men migrants. Central and local governments need to plan for long-term location and protection of vulnerable populations, recognizing that the needs and constraints of women and men are different. City management needs to address critical issues of environmental health, particularly relating to water, drainage, sanitation, waste management, and congestion.	NEC, NDMC, MoEF, MWCA, MFDM/DMB, LGD, NILG, urban LGIs
Inclusive and accountable environmental governance can facilitate gender-responsive adaptation. Strengthen gender mainstreaming efforts at the national policy level by supporting links and capacity-building activities among key ministries and specialized bodies, such as those working on climate change as part of the United Nations Framework Convention on Climate Change processes. Improve women's participation at national, regional, and local levels by including representatives from a range of women's organizations in environmental governance bodies and processes. Build capacity to help individual women, women leaders, women's organizations, and gender-focused NGOs become more effective participants. Expand women's involvement in demand-side accountability mechanisms for environmental governance (such as gender audits and citizen report cards).	NEC, NDMC, MoEF, MWCA, MFDM/DMB, LGD, NILG
A gender-informed, cross-sectoral monitoring and evaluation system will help monitor progress. It is important to create a gender-informed monitoring and evaluation system, or integrate gender into existing systems, including key sex-disaggregated indicators, to monitor progress in policy implementation and impacts.	MWCA, planning commission
Sensitivity-reducing strategies: short-term actions	
Rehabilitation of embankments with adequate drainage and full participation of women and men. Embankments help reduce the sensitivity of people to certain hazards, especially in coastal and urban areas. However, some have either been damaged or are not functioning properly, and are not able to protect the population. Some also created water stagnation that degraded the environment and disrupted livelihood. Involving local women and men will be important for the rehabilitation and maintenance of the embankments.	LGD, LGED, MoWR, WDB
Construction and rehabilitation of gender-friendly, multipurpose shelters. Such structures should provide special provisions for women, including a separate toilet, preferably a separate women's floor, and space designated for pregnant and elderly women.	LGD, LGED
Enhancing adaptive capacity: short-term actions	
Infrastructure and utility services in climate-vulnerable areas will enhance adaptive capacity. Better road and water networks and improved electricity, energy, and water and sanitation services can help well-being as well as enhance productive activities and income.	LGED, DPHE, MoWR, MoE
Human development services will enhance adaptive capacity. Education and health facilities and productive safety nets can improve the adaptation capacity of poor women and men. These services can also help develop entrepreneurial capacity for self-employment, rather than day-to-day survival.	MoED, MoH, MoSW, MFDM, LGIs
Enhancing adaptive capacity: medium-term actions	
Climate-resilient economic opportunities, especially for women, will enhance adaptive capacity. Government can allocate more funds to district and upazila headquarters and municipalities and promote employment generation and entrepreneurship development.	NEC, NDMC, MoF, LGD, LGIs,
Equal rights and resources for women will promote climate-resilient development. Increase women's access to economic opportunities from climate-resilient sources; these economic opportunities include productive assets (equipment, technology, and infrastructure such as water, sanitation, energy, and ICT services), financial capital (loans), human development (education, health, skill development for high-value productivity), and social capital for their empowerment.	NEC, NDMC, MoF, LGD, LGIs, NGOs,

Source: Author's compilation.

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