Gender Issues in Community-based Disaster Management: A Study on Flood Affected People in Bangladesh

Md. Anwar Hossain

A thesis submitted for the fulfillment of the requirements for the degree of Doctor of Philosophy in Social Welfare

Institute of Social Welfare and Research
University of Dhaka
Dhaka-1205

May 2014

Certificate from the Supervisor

This is to certify that the thesis entitled **"Gender Issues in Community-based Disaster Management: A Study on Flood Affected People in Bangladesh"** done by Mr. Md. Anwar Hossain is an original research work. The views expressed in the thesis are originated from field-based data and is entirely his contribution. The thesis has not been submitted anywhere else for any purposes, e.g., degree or publications. This may be submitted to the examiners to evaluate for awarding the degree of Doctor of Philosophy in Social Welfare.

(Dr. Muhammad Samad)
Vice Chancellor
University of Information Technology and Sciences (UITS)
Baridhara
Dhaka

and

Professor
Institute of Social Welfare and Research
University of Dhaka
Dhaka-1205

Declaration

I hereby solemnly declare that this thesis represents my own work based on field-based data, except where due acknowledgment is made, and that it has not been previously included in a dissertation or report submitted to any university or other tertiary institution for a degree, diploma or other qualification.

(Md. Anwar Hossain)
Ph.D. Researcher (Session: 2009-2010)
Institute of Social Welfare and Research
University of Dhaka
Dhaka-1205

Acknowledgements

I wish to express my sincere thanks to a number of people and organizations for their great support, kind help and good advice to complete this study. At first, I would like to express my deepest and sincere gratitude and appreciation to my leaned supervisor Professor Dr. Muhammad Samad for his scholastic guidance, constructive criticism, valuable suggestions, considerable support and continuous encouragement from the beginning of the study to its end in the completion of this thesis. It would not have been possible to complete this study without his enthusiasm and painstaking labor put in.

I would also like to convey my sincere thanks to Professor Md. Jalal Uddin and Professor Dr. K.M. Rabiul Karim of the Department of Social Work, University of Rajshahi, for their generous support and encouragement to conduct the study. I am especially thankful to Professor Karim for his inspiration and valuable comments on the research issue of my study.

I am no less grateful to those female and male respondents of the two study villages and key informants, without whose cooperation, patience and generosity, this research work would not have been possible to complete. No word of gratitude would be sufficient thanks to my respondents. I acknowledge their kind cooperation with utmost sincerity.

I am also thankful to Mr. Muhammad Anwar Hussain, *Upazila* Nirbahi Officer, Islampur, Jamalpur; Mr. Julkarnayem, Assistant Commissioner (Land), Belkuchi, Sirajganj; Mr. Md. Shafiqul Islam, Instructor, *Upazila* Resource Center, Belkuchi, Sirajganj; Mr Muhammad Ferdous Akand, Lecturer in Social Work, Islampur M.A.S.-P.M. M College; Mr. Md. Nazrul Islam, Mr. Golam Kader, Mr. Khaza Kader, Ms. Rupa Yeasmin, Ms. Lam Mim Shimu, Mr. Aniq, and Mr. Chand Mohammad for their invaluable cooperation during data collection and field study.

I am grateful to Director, Institute of Social Welfare and Research (ISWR), University of Dhaka, for his kind cooperation from the beginning to the end of my study. I am also grateful to designated discussants of my seminarsand faculty members of ISWR for their valuable comments on my seminar papers that helped me enriching my thesis. I am also

grateful to the authority of theUniversity of Rajshahi for giving me permission to get admission into Ph.D. Program at ISWR. I am obliged to the authority of JagannathUniversity for granting me study leave for pursuing my study.

I am heartily thankful to Social Science Research Council, Planning Commission, Ministry of Planning, Government of the People's Republic of Bangladesh, for providing me with a small financial support in carrying out the study.I am grateful to Poet Shihab Sarkar for his generous help and cooperation particularly in enriching the English Language in my thesis.

Finally, I am sincerely thankful to my wife Shahana Nasrin for her sincere cooperation and constant assistance. She always encouraged me to complete my thesis in scheduled time. Another person, who deserves thanks, is my beloved daughter Afia Farzana Hossain. She took all the troubles during writing my thesis. I would not thank her, rather I pray to Almighty for her future development because I owe her a lot.

Md. Anwar Hossain
May 2014

Abstract

Prediction of some studies on global warming and climate change delineate that global warming could bring drastic change in nature and extent of natural disasters. Many areas of the globe will be severely affected by various types of natural disasters. Hence, experts in disaster management, international aid agencies and other stakeholders emphasized that disaster events should be faced with proper plans and programs where participation of the affected people, both male and female, should be ensured. In such a situation, the present study is an attempt to analyze gender issues in disaster management practices embedded in rural society ofBangladesh with specific reference to flood. It identifies the nature of problems faced by the flood victims,and explores the indigenous mechanisms adopted by the people at household level and roles of other stakeholders to combat the flood situation. It examines the nature of people's gender-specific participation in disaster management activities and explores the factors constructing their responses to flood. It also examines whether women of the flood affected area are merely passive victims of flood or their problems are addressed properly and their roles are considered as an important contribution in managing natural disaster event like flood.

In achieving the defined objective and responding to above-mentioned question, a mixed method approach was followed in this study. Data were collected from 408 samples, of whom 204 were men and 204 were women, selected by using mixed method sampling procedure. A survey with face to face interview was conducted. Primary data were also collected through focus group discussions(FGDs), and non-participantand direct observations to increase the validity of data through triangulation. Data were also collected from key informants to supplement the survey data. However, both qualitative and quantitative data analysis approaches were followed to analyze the collected data.

From the findings, it appears that problems faced by the flood victims and strategies adopted to combat the situation are gender identical. Flood affects women more severely than men because of their gender-specific needs and responsibilities that become much more difficult to perform during flood. Although GAs and NGOs provide some services in addressing women's problems that are not sufficient compared to their needs. However, data indicate that women's participation in disaster management activities and decision-making process is constrained by prevalent gendered norms. But it is important

to mention that despite the existing barriers, sprung from the gendered norms of rural Bangladesh, a significant number of women are found to participatein training and awareness-building programs. Consequently, the study investigates which factors influence their participation. The study finds that women's participation is associated with socioeconomic factors such as age, educational qualification, household income, and organizational involvement.

It appears that the male members of the family and society do not simply dominate women by assigning additional workload to them during and in the aftermath of floods rather they acknowledge their (women's)rolesas a valuable contribution in combating flood-induced problems. It indicates the social transformation of power-based hierarchical relationship with reciprocity and mutuality as their contribution was not recognized earlier.

However, GAs and NGOs provide various types of services for preparedness, response to and recover from flood induced disasters that indicate the GA-NGO partnership in every phase of disaster management. But the services are confined to distributing relief items, and constructing and repairing *kancha* roads and other infrastructure. None of the organizations are found to organize the flood-affected community and assess the needs, strengths and weaknesses of the community before or after floodsfor adopting a risk management plan for better adaptation of the flood victims. It indicates that the GA-NGO collaboration in Bangladesh yet achieved the goal of shifting disaster management paradigm from conventional emergency response to disaster risk management. But it is on way to achieve the defined goals as GAs and NGOs have already adopted and implemented some programs in accordance with the philosophical notion of Alternative Perspective of disaster management**.** In addition, although majority of the flood-affected people of the study area receive GA-NGO support services finally they follow indigenous strategies such as selling assets, receiving assistance and borrowing from non-institutional sources such as friends, relatives and neighbors, changing eating behavior and occupation and so on to combat the situation created by flood. Therefore, the study proposes some mechanisms to empower the community at risk and enhance the resiliency of the flood prone areas like Bangladeshfrom a pro-poor and pro-women socioeconomic development intervention perspective.

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Abbreviations

ADB	Asian Development Bank
ADPC	AsianDisasterPreparednessCenter
ADRC	AsianDisasterReductionCenter
ASA	Association for Social Advancement
BBS	Bangladesh Bureau of Statistics
BCAS	BangladeshCenter for Advance Studies
BDT	Bangladeshi Taka (local currency of Bangladesh)
BELA	Bangladesh Environmental Lawyers' Association
BIDS	Bangladesh Institute of Development Studies
BUET	BangladeshUniversity of Engineering and Technology
BRAC	Bangladesh Rural Advancement Committee
BRDB	Bangladesh Rural Development Board
CBDM	Community-based Disaster Management
CCC	Climate Change Cell
CDMP	Comprehensive Disaster Management Program
CLP	Char Livelihood Program
DFID	Department for International Development
DMB	Disaster Management Bureau
DoE	Department of Environment
DPHE	Department of Public Health Engineering
DSS	Department of Social Services
DYD	Department of Youth Development
ECOSOC	United Nations Economic and Social Council
ESDO	Environmental and Social Development Organization
FFW	Food for Work
FGD	Focus Group Discussion
FGDs	Focus Group Discussions
GA	Government Agency
GAs	Government Agencies
GDP	Gross Domestic Product
GO	Government Organization

GoB	Government of Bangladesh
GOs	Government Organizations
HSC	Higher Secondary Certificate
KIs	Key Informants
KMs	Kilometers
LGED	Local Government Engineering Department
LR	Likelihood Ratio
MBBS	Bachelor of Medicine, Bachelor of Surgery
MoDMR	Ministry of Disaster Management and Relief
MoEF	Ministry of Environment and Forest
MoF	Ministry of Finance
MoFA	Ministry of Foreign Affairs
MoFDM	Ministry of Food and Disaster Management
MoHFW	Ministry of Health and Family Welfare
NGO	Non-government Organization
NGOs	Non-government Organizations
OMS	Open Market Sale
ORS	Oral Rehydration Salts
PALM	Participatory Learning Method
PLA	Participatory Learning Approach
PRA	Participatory Rural Appraisal
RCC	Road Cement Concrete
RDRS	Rangpur Dinajpur Social Service
RSS	Rural Social Service
SSC	Secondary School Certificate
Tk.	Taka (local currency of Bangladesh, USD 1= Tk. 77.50)
UN	United Nations
UNDP	United Nations Development Program
UNO	*Upazila Nirbai* (Executive) Officer
UP	Union *Parishad*
VGF	Vulnerable Group Feeding

Glossary

Aila	One of the devastating cyclone event occurred in 2009 in the Southern part of Bangladesh
Amon	Variety of local paddy harvested in October-November
Aush	Variety of local paddy harvested in August
Barsha	Annual normal flood event that is helpful for agricultural production
Beel	Water body/wetland areas
Blouse	Garment for upper portion of women
Bonya	Severe/extreme/abnormal flood event that causes sufferings of the people and damages crops, lives and livelihood process
Borka	Veil
Char	Land areas composed of sandbars formed within a river or estuary. It is also isolated from mainland and usually it has no utility services such as electricity, water and gas.
Chira	Flattened rice
Chula	Stove, made of clay
Crore	Ten millions
Eid	Muslim religious festival celebrated twice a year
Ekti bari ekti khamar	It is a project of the Government of Bangladesh for the homeless people where a house is built with facilities of vegetable garden as well as poultry and livestock rearing.
Farakka	A place situated in India near the border of Bangladesh where India built a dam to control water flow of the Ganges. It is known as Farakka Barrage from where India diverts the Ganges water by a canal.
Ghor	A house/a dwelling
Gur	Molasses made of sugarcane or date/palm juice
Haat	Weekly or bi-weekly rural market where people are gathered on specific day(s) for transaction of their commodities
Haor	Extensive marsh
Jamuna	One of the big rivers in Bangladesh
Jhar-fuk	Curing a disease by means of faith-healing
Kancha	Made of mud or earth, e.g., kancha *rasta* (earthen road)
Kasban	Forest of species of tall grass

Khana	Household
Khasland	Government land
Khata	A book for writing or scribing
Khoi	Parched/toasted paddy
Kolsi	Earthen jar particularly used in rural Bangladesh for collecting and preserving water
Kurta	One kind of traditional shirt worn by men
Lungi	Traditional dress worn by men in lower part of the body
Machang	Platform made of bamboo and wood for taking shelter and keeping goods during flood
Madrasa	Religious academic institution for Muslim children
Mahajan	Moneylender who lends money with high interest rate, wholesale dealer of commodities is also known as *mahajan* in the study area.
Meghna	One of the big rivers in Bangladesh
Muri	Puffed rice
Paijama	Traditional loose-fitting trouser of men
Pani-pora	Water over which Quranic verses had been cited, used in curing a disease by means of faith-healing
Panjabi	Traditional loose-fitting shirt of men
Parishad	Council, e.g., Union *Parishad* (Council), the lowest tier of the three tier rural local government system inBangladesh
Pourashava	Municipality
Pucca	Concrete, e.g., *pucca rasta* (concrete road)
Purdah	Seclusion practiced by the Muslim women usually by wearing a veil
Rasta	Road
Robi	A cropping season between November and February (Bengali month *Agrahayan* and *Falgun*)
Salwar-kamiz	Loose-folded trouser and long shirt worn by young girl
Sari	Traditional long cloth worn by women
Shamiti	Cooperative association
Taka (Tk.)	Local currency of Bangladesh. 1 USD=77.50 Taka
Upazila	Sub-district. It is a field level administrative unit in Bangladesh
Uthan boithak	Meeting held at courtyard
Utulla	Refugee or landless people who live in others' land/government land

Chapter I
Introduction

1.1 Background of the Study

Bangladesh is one of the world's countries most vulnerable to natural disasters because of its geographical location, land features, innumerable rivers and the monsoon rains. Since time immemorial, the country has experienced different types of natural disasters such as flood, cyclone, tidal bore, and drought and so on. Of these disasters, flood is almost an annual phenomenon. Sometimes, it turns into a terrible natural event and causes loss of human lives and livestock halting development efforts. Thus, experts in disaster management as well as those in aid and development agencies feel that natural disaster-related events including floods should be faced with proper planning and programs. The goal is to reduce the damages of property and shorten the ordeals and sufferings of the people as well as to enhance the sustainable development process of the society in which active participation of the affected people should be ensured. In keeping with this view, the Government of Bangladesh has adopted the Draft National Disaster Management Policy (DMB, 2008) and prepared the National Plan for Disaster Management 2010-2015 (DMB, 2010). It also introduced community-based disaster management programs emphasizing capacity building of community, promoting livelihood, and empowering the community at risk.

However, findings of different studies (Abrar & Azad, 2004; Saleheen & Huda, 2001; Schaefer-Preuss, 2008; Thapa, 2001) showed that although floods affect all the people of a particular area, women are the most affected segment of population,because of their socioeconomic backwardness. Hence, women's needs and problems have to be addressed adequately to make community-based disaster management a success. And women's participation should be ensured along with men in every stage ofthe disaster management cycle. But to what extent women have access to active participation and how far their needs and problems are taken into consideration in the disaster management process should be assessed with empirical evidence. With specific reference to flood, this study, therefore, is an attempt in this direction that analyzes the existing community-based disaster management practices in rural Bangladesh; problems of the flood-affected people, especially that of women during disasters; the extent of their participationin disaster management; influence of prevalent gender-prompted norms and values on

women's participation; and the effect of socioeconomic factors on enhancing their participation. The study suggests some steps to make community-based disaster management more effective and on augmenting people's participation, especially women's, in disaster management as a policy prescription.

1.2 A Brief Account of the Floods that Occurred in Bangladesh

Bangladesh is a flood-prone country for various reasons, e.g., its geographical location, land characteristics, multiplicity of rivers and a monsoon-dominating climate. Almost every year, floods occur in Bangladesh whether it is severe or less severe. Actually,four-fifths of the landmass of the country is composed of floodplains and low-lying areas and are naturally get inundated by seasonal floods. Although the people of the country have been experiencing floods since time immemorial the deluges since 1954 have been well recoded. The floods of 1954, 1955, 1971, 1974, 1984, 1987, 1988, 1998, 2004 and 2007 were devastating one in respect of loss of lives and livelihoods. Table 1.1 shows a brief account of floods that have been occurred in Bangladesh from 1954 to 2007.

Table 1.1: Coverage of Inundation and Deaths in Major Floods in Bangladesh

Year	Percentage of Flooded Area	Number of Deaths
1954	25	112
1955	34	129
1956	24	NA*
1962	25	117
1963	29	NA
1968	25	126
1970	28	87
1971	24	120
1974	35	1987
1984	19	553
1987	38	1937
1988	52	2373
1998	68	1050
2000	10	36
2004	38	747
2007	43	554

Source: Dewan, Nishigaki and Komatsu 2003:56 and DMB 2010: 7. *Not Available.

It should be noted that normal floods, locally termed *barsha,* are accepted and perceived as beneficial to the people, especially to the farmers, as those help them to grow *aush* and *amon* paddies. Moreover, flood water carries silt and makes soil more fertile. But when it turns into a severe or abnormal flood, locally termed *bonya,* it is regarded as disastrous and a damaging phenomenon (Begum, 1995:18). However, in this study the term 'flood'

has been used to refer to severe or abnormal floods that cause major damage to lives and livelihoods in the affected areas.

1.3 Types of Floods

Floods that usually occur in Bangladesh could be divided into four groups: Flash floods, river floods, rain floods and cyclonic or storm-surge floods (Brammer, 1989 cited, in Begum 1995:19 and Dewan, Nishigaki & Komatsu, 2003:55).

1.3.1 Flash Floods

Flash floods usually occur due to heavy rainfall in neighboring hills and mountains before and after monsoon in the months of April-May and October-November. This type of floods is observed in the northern and eastern parts of the country. Sometimes the middle part of the floodplains is also affected by flash floods. However, flash floods are characterized by a very sharp rise in water level in rivers, and relatively rapid recession of water from the floodplains. Flash flood causes extensive damage to growing crops and property including roads and highways, railways and flood control dams as well as dwellings of the people in the affected areas. A ten-day maximum rainfall exceeding 300 millimeter (mm) is considered as an index for a flash flood (Rasheed, 2008 cited in Younus, 2010:132).

1.3.2River Floods

River floods occur on the onset of monsoon due to heavy rainfall and melting of snow in the upper catchments areas of the major rivers outside Bangladesh. It is characterized by a slow rise in water levels and inundation of large areas. This type of floods is the most common one that occur in Bangladesh. In a normal flood (*barsha*) year about 30 percent of the land area is inundated. In contrast, in case of abnormal/devastating floods, water covers 50 percent to 70 percent of the landmass of the country. However, heavy local rainfall may increase the intensity of the flood. When the water level of the three major rivers (the Ganges, the Jamuna and the Meghna) rises simultaneously, the flood becomes devastating (Begum, 1995:19; Younus, 2010:132); for example, the 1998 flood. It (river flood) submerges a large area and causes damage to crops, homestead and livestock, and brings sufferings for the people. It usually occurs in the months of June to August.

1.3.3 Rain Floods

Rain or rainfall-induced floods are caused by heavy rainfall occurring in Bangladesh during monsoon. Annual average rainfall of Bangladesh is about 2200 mm, ranging from 1100 mm in the west to 5000 mm or more in the northeast (Asia Pacific J. Env. Dev. 2004:48). When the amount of rainfall exceeds the capacity of basins due to local torrential and incessant rain then it creates rain floods in Bangladesh. Embanked areas are usually affected by this type of floods. The extent of damage becomes severe when rain-induced floods coincide with high river floods (Rasheed, 2008 cited in Younus, 2010:133).

1.3.4 Storm Surge Floods

Storm-surge floods occur in coastal regions of Bangladesh. This type of floods occurs when cyclones hit the coastal area adjacent to Bay of Bengal. It causes widespread damage to lives, crops and properties. For example, the cyclone of 1991 killed 1,38,868 people and the surge height was estimated to be between 6-7.5 meters (Dewan, Nishigaki & Komatsu 2003:55). Storm-surge floods are most likely to occur during pre- and post-monsoon periods (April-May and October-November).

1.4 Statement of the Problem

The global scenario in relation to disasters is becoming bleaker. Further, recent studies of the United Nations on global warming and climate change have predicted that global warming could bring about drastic climate changes, resulting in droughts, floods, cyclones and volcanic eruptions in many places that had no or little experience of such phenomena earlier – by which millions of people might be affected (Ariyabandu, 2003:26). Bangladesh will not be excluded from that impact. Moreover, the geographical location, land features, multiplicity of rivers and monsoon climate render Bangladesh highly vulnerable to natural hazards such as floods, cyclones, droughts, tidal surge, tornadoes, cold wave, earthquakes, river erosion, arsenic contamination of ground water, water and soil salinity and various forms of pollution (Disaster Management Bureau, DMB, 2008:3). Of these natural hazards, flood is almost an annual phenomenon in Bangladesh. A total of 28 major river floods occurred in the past five decades. Flat topography, heavy rainfalls, geographical location, trans-boundary flows and the global warming add to the complications the flood problem of Bangladesh. Generally, flood occurs during June through October with ferocity during the months of July and August.

Regular river flood affects 20 percent of the country increasing up to 68 percent in extreme years. The floods of 1954, 1955, 1956, 1974, 1984, 1987, 1988, 1998, 2000, 2004 and 2007 were particularly catastrophic and became a major public concern due to their large-scale trail of destruction and loss of lives (DMB, 2008:3; Khatun, 2003:266; Ministry of Foreign Affairs, MoFA, 2006:13).

However, to reduce the pains and sufferings of flood victims like those of other disasters, to reduce the number of loss of human lives and livestock; government agencies (GAs), international organizations, and non-government organizations (NGOs)have adopted emergency action plans. Until a few decades ago, disasters were viewed as one-off events and were responded to by the governments and relief agencies without taking into account the social and economic implications, and the causes of these events(Yodmani, 2001). These initiatives were not adequate to combat disasters in a proper manner.Hence,the aid and development agencies were looking for new approaches to disaster management.They proposed to adopt the bottom-up approach considering local needs, problems and resources instead of a top-down approach in which local needs, problems and resources are not taken into account.Thus, the disaster risk reduction approach has been shifted from a top-down to a bottom-up approach. The ultimate target of the bottom-up approach is to introduce community-based disaster management approach which is designed primarily by and for the people in certain disaster-prone areas, where participation of the entire community is necessary (Ariyabandu, 2003:7). Indigenous knowledge, practices, and problems as well as resources of a local community are taken into consideration in this approach.The Government of Bangladesh has designed a comprehensive disaster management program (CDMP) inspired by the philosophical notion of this approach. The key focus of CDMP is on developing partnership and empowering the communities at risk (CDMP, n.d.:4).

It is evident that although disasters affect the whole community, it has a gender-centric dimension. The disaster-related problems affect rural women more severely than men (Abrar & Azad, 2004; Saleheen & Huda, 2001; Schaefer-Preuss, 2008; Thapa, 2001). Predicting this matter earlier, in order to uphold women's plight and to reduce gender inequality, the Beijing Platform for Action, adopted at the Fourth World Conference on Women (1995), and the ECOSOC agreed conclusions (1997/2); call on Member States, the United Nations, international organizations and non-government organizations to

systematically incorporate gender perspectives into all policy areas, including in environmental management and natural disasters. This is in important strategy of gendermainstreaming,which aims to ensure that all policies, strategies and implementation of projects and programs are based on a full understanding of priorities and needs of women and men, and girls and boys. But unfortunately, the resulting document of the twenty-third special session of the General Assembly (June 2000), in following-up the implementation of the Platform for Action, noted that the social and economic impact of natural disasters and epidemics, particularly the impact on women, gender relations and the achievement of gender equality had remained relatively invisible as a policy issue (Hannan, 2002:2).

However, effective risk assessment and management require active involvement of local communities and civil society groups to ensure decreased occurrence of disasters as well as reduced losses and costs when they occur. The knowledge, contributions and potential of both women and men, therefore, need to be identified and utilized. Because when women do not receive adequate information on hazards and risks and the links to natural resource use and environmental sustainability to the same extent as men, there is a risk that they can contribute directly and indirectly to environmental vulnerability. Furthermore, because of gender-specific constraints – lack of decision-making capacity, lack of capital of different forms (financial, physical, human, and social) and socio-cultural norms on mobility – women may need additional support in order to be able to act effectively upon such information/warnings(ibid: 4-5).

The disaster preparedness planning, therefore, must be developed by adopting a 'bottom-up' approach guided by national policy where the gender issue will be included. The 'bottom-up' process of disaster preparedness planning ensures the consideration of needs for mutual support between local communities, districts and so on. This process also reveals gaps and differences in resources available, both human and material, which need to be met from external sources including internal aid. This provides an effective way of turning theory into practice, but in many ways it is dependent upon effective integration of community needs and responsibilities (Ritchie, 2003:109-110).

It has been mentioned earlier that considering the advantages of bottom-up approach there has been a paradigm shift from a traditional relief and disaster preparedness (top-down) approach, where communities are considered "victims and beneficiaries" of

assistance from outside experts, towards a more logistics-based and long-term approach of "incorporating vulnerability reduction and risk management" concern as part of the development planning process, where the people are the main actors of this process (bottom-up). During this paradigm shift, there has been a growing realization that disaster mitigation is most effective at the community level (Murshed, 2003:145), because the community people themselves are the first responders to disaster (Ritchie, 2003:102). On the other hand, top-down intervention alone in disaster management is insufficient because such intervention often pay little attention to addressing community dynamics, perceptions and needs, and may ignore the potential of local resources and capacities and in some cases, may even increase people's vulnerability (Murshed, 2003:146).

Considering the merits of 'bottom-up' approach and demerits of 'top-down' approach, the Government of Bangladesh has adopted the draft National Policy for Disaster Management, prepared the National Plan for Disaster Management 2010-2015 and drawn-up other plans and programs emphasizing community participation, especially women's, in disaster management activities. But the prevalent socio-cultural norms of rural Bangladesh restrict women's mobility and participation in extra household affairs (Kabeer, 2000; World Bank, 1996). In such a situation, how the women of rural Bangladesh can participate in the disaster management process? How do they face the disaster situation? What kinds of problems do they face during disasters? What kinds of steps do they take to overcome the situation?Whataffects their participation in disaster management activities? If we want to adopt community-based gender-sensitive disaster management plan, and to make community-based disaster management a success, the above-mentioned issues should be addressed properly with empirical evidence. Therefore, a systematic, as well as scientific, investigation is essential to this area and the present study is a step forward in this direction.

1.5. Conceptual Issues

1.5.1 Gender Issues in Disaster Management

Before going to discuss gender issues in disaster management we should distinguish between sex and gender. '**Sex'**refers to biologicaldifferences associated with being male or female. On the other hand,'**Gender**'refers to the sociallyconstructed stereotypes, roles,opportunities, problems and relationships associated with being male or female (Connell, 2002:8-9; Giddens, 1993:162-163). Sex is given, static and does not change

over time. In contrast, gender is dynamic and can change over time, within and acrosscultures.Socially reproductive work, therefore, is changeable and can be performed by both women and men. Social roles are distributed variedly among the men and women. Every society recognizes many behaviors, not immediately related to procreation, as more suitable to females or more suitable to males. It depends on society's culture whether it is masculine or feminine society. **Masculinity** pertains to societies in which emotional gender roles are clearly distinct: men are supposed to be assertive, tough, and focused on material success, whereas women are supposed to be more modest, tender, and concerned with the quality of life. On the other hand, **femininity** pertains to societies in which emotional gender roles overlap: both men and women are supposed to be modest, tender, and concerned with the quality of life (Hofstede & Hofstede, 2005:120).

In the perspective of gender relations, Bangladesh is predominantly a masculine country (Ameen, 2005; Cain, Khanam & Nahar, 1979; Hofstede & Hofstede, 2005; Kabeer, 1994;Khan, 2001; Mahtab, 2007), where women are supposed to be modest, tender and concerned with the quality of life. On the other hand, men are supposed to be assertive, competitive, tough, and concerned with material success (Hofstede and Hofstede, 2005:117-118). Women's movement in public places is restricted due to patriarchal norms and values. Almost all of the decision-making powers and control over resources are generally captured by men. In such a situation, one of the main objectives of this study is to examine participation of rural women of Bangladesh, asmember of a masculine society, in disaster management and also to investigate how women's needs and problems are taken into account during disaster and post-disaster situation.

1.5.2 Disasters

It is not easy to explain the concept of disaster in a simple way because of its connection with multifarious factors. Over a decade there has been a profound discussion on social and economic issues related to disasters. During this period, some important concepts and terms have been introduced that has led to what is now commonly understood as a disaster. Disasters are usually understood as unforeseen phenomena in social life that are assumed to be beyond the sphere of human control. The term 'disaster' refers to any sudden, unexpected or extraordinary misfortune that disrupts the prevailing order of life, causing danger, injury, illness, death and loss of property (Kumar, 2001:92). However, a

disaster is also described as combination of hazard and vulnerability. According to Ariyabandu (2003: 28),

> "Hazard is defined as the probability of the occurrence of a dangerous phenomenon at a given place within a given period of time. On the other hand, vulnerability is defined as the degree of susceptibility to a hazard, or the lack of capacity to absorb the impact of a hazard and recover from it."

Vulnerability also refers to a set of prevailing and consequential conditions, which adversely affect the ability of a person, group or community to prevent, mitigate, and prepare for and respond to hazardous events (Bhatti, 2003:58). It is related not only to physical factors, but also to a range of social, economic, cultural and political factors (Ariyabandu, 2003:28). However, hazards might have their origin in nature but these turn into disasters through societal process. For example, climatic hazards like floods, cyclones, droughts, tidal waves etc. are part of a meteorological risk but these turn into disasters when the structural and non-structural infrastructure of the affected area are too shabby to cope with these risks (Bhatti, 2003:58). Therefore, a disaster is an outcome of a hazard impacting on vulnerable populations. In this situation, hazard by itself is not a disaster unless there are vulnerable populations who don't have the capability to combat it and who are unable to cope with it. UNDP (2007:2) analyzes this issue more profoundly. It defines disaster,

> "as a function of the risk process. It results from the combination of hazards, conditions of vulnerability and insufficient capacity or measures to reduce the potential negative consequences of risk. Natural hazards become disasters if they induce a serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources."

Murphy and Dolan (2003:1) also put stress on capacity of the local community to cope with the catastrophic situation in defining disasters. They assert that disasters may be defined as a risk-event that swamps the capacity of a local community to combat the consequences of that event. On the other hand, Carter (1992: xxiii) defines disasters as an event, natural or man-made, sudden or progressive, which impacts with such severity that the affected community needs to take exceptional measures to respond to such an event.

However, a disaster is the occurrence of an abnormal or infrequent hazard that impacts on vulnerable communities or geographical areas, causing prolonged damage, disruption and possible casualties and leaving the affected communities unable to function normally and requiring outside assistance (Benson and Twigg, 2004: 6/20). Similar views are found in the definitions of the Government of Bangladesh (MoDMR, 1999:1) and International Strategy for Disaster Reduction (cited in Benson and Twigg, 2004: 6/20). They define disaster as a serious disruption of the functioning of society, causing widespread human, material or environmental losses which exceed the ability of the affected society to cope with, using only its own resources. Therefore, flood has been considered as a disaster in this study when it causes widespread losses of material and non-material resources, disrupts the livelihood process of the affected community, and the affected people cannot cope with itusing only their own resources.

1.5.3 Disaster Management

Disaster management, nowadays, became a serious concern among the stakeholders because of frequent occurrence of the various types of disasters and their consequences. Sociologists, public administrators and social workers as well as development organizations and donor agencies put enormous emphasison managing disasters with proper plans and programs, as it breaks down the livelihood process of the affected community and hinders the sustainable development process. Generally, disaster management refers to the collective action encompassing all aspects of preparing for, responding to and recovery from disasters that include the activities carried out before, during and in the aftermath of disasters. A comprehensive disaster management approach includes five basic phases: prevention, preparedness, emergency response, recovery andmitigation (Bhatti 2003:59; Cater, 1992).

Prevention includes the measures taken to impede the occurrence of a disaster. But it is notpossible to prevent the occurrence of natural disastersentirely,though the extent of its damages can be reduced (Ahmed 1994:33). **Preparedness** covers the activities designed in anticipation of a disaster to ensure that appropriate and effective action is taken in advance. These actions include the disaster plans, the training of responders, the maintenance of human, material and financial resources and the establishment of public education and information system (Kreps et al. 2006:19). **Emergency response** covers the indispensable services and activities that are undertaken during the initial impact or in

the aftermath of a disaster including those to save lives and to prevent further damage to property (Bhatti, 2003:59;Kapucu, 2008:244; Kreps et al. 2006:20).

However, **recovery** is the action or process of getting back something that has been lost (Hornby, 2000:1063). In disaster management, recovery refers to the activities that are taken after the initial impact to develop socio-economic and environmental conditions that are destroyed by disastersaimed at achieving return to normality(Kapucu, 2008:244), that is, disaster recovery activities are related to the reestablishment of pre-disaster social and economic routine provisions of financial and other services to the victims, as well as repair of destroyed properties (Kreps et al. 2006:20). **Mitigation** involves the measures that can be adopted to minimize the destructive effects of hazards and to lessen the magnitude of disasters.These activities can occur before, during and after disasters and overlap all phases of disaster management. However, the meaning of some terms, that is, 'preparedness', 'mitigation' and 'prevention' is very often overlapping (see WFP 1999 for details). These measures are related to the reduction of risks and consequences of disasters.Therefore, in this study disaster management has been considered as an approach in combination of preparedness, emergency response, and recovery to combat the hazardous situation created by floods.

1.5.4 Community-based Disaster Management

Community-based disaster management (CBDM)is a new concept that emerged from bottom-up approach (Alternative Perspective).It can be seen as risk reduction programs designed primarily by and for the people in certain disaster-prone areas, where participation of the entire community is necessary (Ariyabandu, 2003:7). It is recognized in community-based approach that communities are knowledgeable about the disasters happening and are able to anticipate their effects. So, communities are put at the forefront in CBDM. However, communities may not be scientific in comprehension but the richness of experience and indigenous knowledge is a resource to be recognized. If their resources are developed with proper training and information, the communities would be able to safeguard and minimize disaster risks. Therefore, it is essential that local capacities should be strengthened to assess risks and develop mitigation strategies that are based on the communities' human, financial, information and material resources (Yodmani, 2001:5).Hence, community-based disaster management has been used in this study as the process in which disaster management plans and programs are prepared and

implemented at local level, where community participation is ensured in every stage; and knowledge, experience, problems, needs and resources of a particular community are recognized in this process.

1.5.5 Community Participation

Community participation, generally, refers to the involvement of people in projects to solve their own problems or to develop their socio-economic conditions. They participate in setting goals, and preparing, implementing and evaluating plans and programs. Uphoff (1987 cited in Asaduzzaman, 2008:62) described participation as a process of involvement of a significant number of persons in situations and actions that enhance their wellbeing. Poppe (1992:45) defined participation elaborately. He defined participation as voluntary and democratic involvement of people in decision-making with regard to setting agenda, formulating policies and planning as well as implementing and evaluating any development program. Basically, it is a dynamic group process in which all members of a group contribute, share or are influenced by the interchange of ideas and activities toward problem-solving or decision-making (Banki, 1981:533 cited in Samad, 2002:53). Therefore, the crux of community participation is the exercise of 'voices and choices' of the community and the development of human, organizational and management capacity to solve problems as they arise in order to sustain the improvements made over the time (Sastry 2001:2). Community participation motivates people to work together where people feel a sense of being a part of the community and recognize the benefits of their involvement. In this study, community participation has been used as the process of people's involvement in setting goals, and preparing, implementing and evaluating plans and programs in every phase of disaster management program, where 'voices and choices' of the community are addressed adequately.

1.6 Rationale

There has been a paradigm shift in disaster management from dominant approach to alternative perspective. The main argument of alternative perspective is to include the affected community in every phase of disaster management. Nowadays, almost all of the countries apply community-based disaster management approach to cope with disasters. Literature in this field shows that women, as a group, are the most vulnerable to disaster (Hannan, 2002; Islam, n.d.; Methew, 2003; Thapa, 2001). Therefore, their participation in community-based disaster management approach has to be ensured. Considering this

view, the Government of Bangladesh has adopted the draft National Disaster Management Policy and prepared the National Disaster Management Plan 2010-2015 has drawn up plans and programs emphasizing ensuring of community participation, especially women participation. But how far they have active participation in this process would be assessed by empirical studies. In so far as the researcher's knowledge is concerned there have been many studies on disaster management in Bangladesh, but only a few studies on community-based disaster management, in which the gender issues are addressed adequately, those are briefly stated below.

A study conducted by Elahi (2001) assessed the sufferings of people caused by drought and it identified the mitigation strategies of rural community in Bangladesh. Nino, Smith and Roy (2004) studied the impact of flood on food security and the role of government organization (GO) and non-government organization (NGO) in ensuring food security.On the other hand, BIDS (2004) highlighted the causes of vulnerability of flood-affected people and found that improper planning, least consideration to environmental concerns, poor operation and management are responsible for increased vulnerabilities. The study also found early warning system and awareness building could reduce the suffering of the victims. However, Islam (2006) examined the impact of global warming on floods, vulnerability of floods, and effectiveness of warning. Roy et al. (2009) examined the impact of disaster (*Aila*) on livelihood of disaster-affected people. They found people in disaster-exposed areas suffer from food security, pure drinking water, proper sanitation and so forth. A study carried out by Talukder et al. (2008) found disasters like flood and cyclone destroy water and sanitation facilities that affect adversely the health status of the people in study area. But they did not find any mention-worthy technology that can ensure disaster risk reduction in the flood-prone or coastal areas.

However, some studies particularly focused on coping strategies adopted by affected people in mitigating their sufferings. Abrar and Azad (2004) analyzed the coping strategies of the affected people along with studying the warning system, emotional state of the victims and consequences of river erosion. The United Nations (2010) evaluated the role of local government in reducing disaster risks. The study revealed that participation of all stakeholders enhances the disaster management process. However, Morshed (2007) assessed the prediction capacity of local people whether flood will happen, and identified the strategies that are generally adopted in coping with floods. On

the other hand, Majeed (2009) examined the existing initiatives to cope with the aftermath of a disaster and emphasized integration of ecosystem with disaster management. Hossain et al. (1987) also examined the strategies adopted by local people to face floods and focused on responses by rural people in general.

On the other hand, Saleheen and Huda (2001) in their study focused on the causes of women's vulnerability during disasters. They identified three principal reasons for this vulnerability: low status of women in the family and society, lack of awareness and physical nature of women. But they did not focus on how the situation could be overcome, what are their roles in disaster management, what kinds of support usually they get from the family members or community. Siddika (2008)identified thethreat of climate change to women's livelihood and analyzed the livelihood options for women in flood-exposed area. But the study did not highlight what roles are played by women to cope with disasters and what steps have been taken for long-term adaptation. On the other hand, Nizamuddin et al. (2001) in their studyhighlighted problems created for women by riverbank erosion and survival strategies of the women-headed households but did not focus on women's role in the recovery phase and the community attitude to their striving for coping with disastrous situation.Bose (2008) in her evaluation studyassessed the contribution of an NGO to combat disaster situation. Although the study highlighted women's performance during disasters to cope with the situation, it did not focus on women's role in decision-making process as well as did not establish any theoretical base, although it used the thematic approach.

It is found that there have been a lot of studies on impact of disasters on livelihood process, but few studies on gender issues. Although Nizamuddin et al. (2001),Saleheen and Huda (2001), Bose (2008) andSiddika (2008) focused on women's problems and their strategies of coping with disasters they did not highlight their role in recovery, their participation in adopting disaster management plan at household and community levels, influence of patriarchal norms and values on their participation in disaster management and factors that enhance their participation. This study, therefore, pays profound attention to the identified research gaps. Specifically, the study investigates and explains how gender issues are taken into account both at intra-household and inter-household levels in a triangular interaction of traditional gender norms, socioeconomic background of respondents and disaster management intervention. In addition, none of the researchers

used any theory in analyzing their findings. But the present study employs Alternative Perspective, Ecofeminism and Socioeconomic Background Perspective of Empowerment Theory advocated by Kabeer (2001 & 2005) in analyzing research findings. In this respect the present study is unique in its nature and a pioneer work in the field of gender and disaster studies.

However, it is expected that the study will unveil some hidden truths related to gendered norms which have not been exposed by previous studies, and the findings of the research produce new knowledge in studyinggender issues in disaster management in Bangladesh and it provides data for future works in this respect which perhaps other researchers in future may develop further and consolidate through their works. Moreover, the findings of the study may also contribute to formulating policies and plans for pursuing women's participation in community-based disaster management programs and also in sustainable development in the context of Bangladesh.

1.7 Objectives of the Study

The general objective of this study is to analyze gender issues in disaster management practices embedded in rural society of Bangladesh. The specific objectives are as follows:

1. To explore the nature of problems faced by the people, especially by women due to flood;
2. To identify the local practices of disaster management in rural Bangladesh i.e. preparedness, coping and adaptation strategies and services provided by GAs and NGOs;
3. To know about the nature and extent of people's gender-specific participation in community-based disaster management;
4. To understand the influence of prevalent gendered norms and values of the society on women's participation in disaster management activities; and
5. To examine the effect of socioeconomic factors on women's participationin disaster management.

1.8 Assumptions

My research content pertains to studying the gender issues in community-based disaster management. The study particularly highlights to what extent rural women participate in different stages of disaster management. It should be noted that participation is a complex

issue that depends upon multiple factors. It needs to have legal ground and the socio-cultural contexts should be supportive to participation since people live in a particular environment and culture; and the behaviors of the members of a society are not context-free – rather influenced by the existing situation (Scott, 2001:23). Moreover, because of differences in socioeconomic backgrounds of actors, there may be differences in the level of their confidence, awareness, and capabilities that may affect the nature of participation. Thus the study is devoted to assessing the attitude of community toward women's participation, i.e. whether it fosters or constrains their participation, and identifies the socioeconomic factors that influence their participation. The study, therefore, has taken a few assumptions to make critical analysis of the findings that helped in validating and clarifying the research issues:

a. The GA-NGO collaboration is an attempt to shift disaster management paradigm from conventional emergency response to disaster risk management.
b. In general, natural disasters, especially floods, are being managed at community level in rural Bangladesh.
c. Rural women of Bangladeshstill hold subordinate position with regard to participation in decision-making process.
d. Patriarchal norms, values and other socioeconomic factors influence women's participation in disaster management activities.
e. Social transformation in terms of gendered ideology has been occurred in rural Bangladesh.

1.9 Theoretical Framework

Three theories such asAlternative Perspective,Ecofeminism andSocioeconomic Background Perspective of Empowerment Theory have been used in this studyto analyze the research issues. The researcher used Alternative Perspective of disaster management to investigate whether there has been any change in disaster management policy in accordance with paradigm shift from emergency relief distribution to risk reduction; used the theory of Ecofeminism to examine whether the male domination still exists in rural society of Bangladesh with especial reference to disaster management and analyze the influence of prevalent norms and values on women participation; and Socioeconomic Background Perspective to examine the relationship between socioeconomic backgrounds of women and the extent of their participation at household and community

levels.Thetheoretical perspectivesand the way these theories have been operationalized has also been discussed below:

1.9.1 Alternative Perspective

The study makes an enquiry about the disaster management policies and practices of flood affected areas of rural Bangladesh. It investigates whether the existing disaster management policy and plans follow community-based participatory ('bottom-up') approach or the main focus lies only on emergency response and relief distribution that is highly centralized 'top-down' approach. To analyze these issuesthe present study used Alternative Perspective of disaster management, proposed by Duryog Nivaran, the South Asian Network for Disaster Mitigation (Ariyabandu, 1999; Ariyabandu & Wickramasinghe, 2005). It should be noted that till the recent past South Asian countries used to practice Dominant Approach in managing disaster events that emphasizes emergency response and relief, where the affected people have little scope to participate in policy formulation process. Actually, top-down intervention alone in disaster management is insufficient (Murshed, 2003:146) because such intervention often play little attention to addressing community dynamics, perceptions and needs, may ignore the potential of local resources and capacities and may, in some cases, even increase people's vulnerability.

Considering the above-mentioned limitations of Dominant Approach, Duryog Nivaran, the South Asian Network for Disaster Mitigation, advocated for Alternative Perspective (Ariyabandu, 1999; Ariyabandu & Wickramasinghe, 2005). The Alternative Perspective proposes such ways of mitigating disasters that include all aspects of disaster management such as risk reduction, disaster preparedness, immediate relief, rehabilitation and long-term reconstruction.

However, other reasons behind paradigm shift from Dominant Approach to Alternative Perspective arise against the backdrop of ineffectiveness of Dominant Approach in mitigating disaster risk which focuses on emergency response and relief works. Responses to disasters are usually unsystematic and come-down from highly centralized inflexible bureaucracy and outside experts (Heijmans&Victoria, 2001:16; Allen, 2006:82), where the community at risk are hardly involved in decision-making process. In Dominant Approach, funds allocated by the government are withheld from use until a disaster strikes (Ariyabandu & Wickramasinghe, 2005:35) and the people are treated as

helpless victims (Hewitt, 1983 cited in Flint & Luloff, 2005:401). On the other hand, different studies show that communities are knowledgeable about the disasters happening and are able to anticipate their effects (Abrar and Azad, 2004;Morshed, 2007; Sampath, 2001). They may not be scientific but the richness of experience and indigenous knowledge is a resource to be recognized. If their resources are developed with proper training and information, the communities would be able to safeguard and minimize the disaster risks. Therefore, community-based approach should be employed in disaster mitigation interventions (Ariyabandu& Wickramasinghe, 2005:36) that considers societal condition at the center of exposition and explanation of disasters (Hewitt 1998 cited in Flint & Luloff, 2005:401), and to make it a success local capacities should be strengthened to assess risks and develop mitigation strategies that are based on the communities' human, financial, and material resources.

However, the ultimate goal of Alternative Perspective is to introduce community-based disaster management (CBDM) program. CBDM can be seen as risk-reduction programs designed primarily by and for the people in certain disaster-prone areas where participation of the entire community is necessary. CBDM is a promising model in disaster management that incorporates the principles of community mobilization and organization.This method endeavors to reform the top-down approach that has failed to meet the needs of vulnerable populations and ignored the potential of local resources and capacities (Victoria, 2001 cited in Pyles, 2007:325). Proponents of the community-based approach believe that consideration of local situation, and ensuring community participation are 'suitable strategies' for grasping the dynamics and complexity of vulnerability, addressing vulnerability and strengthening local capacities' as vulnerabilityis manifested at the local level (Van den Eynde & Veno, 1999:171cited in Pyles, 2007:325). During this paradigm shift, there has been growing realization that disaster mitigation is immensely effective at the community level (Murshed, 2003:145) because the community people themselves are the first victims as well as persons responding (Ritchie, 2003:102). Hence, the disaster-prone community should be empowered with proper training and necessary information.

This perspective recognizes that communities have an important role to play in disaster mitigation, and, therefore, the community should be included in disaster management process and the community's capacity should be strengthened. The study reviews the

existing disaster management policy, plans and programs of Bangladesh and examines by using philosophical notion of Alternative Perspective whether the plans and programs bear the features of community-based participatory approach or simply emergency response oriented dominant approach.

1.9.2 Ecofeminism

The study examines to what extent rural women of Bangladesh have active participation in disaster management plans and programs. It also highlights whether the male members of the family and society simply dominate women by assigning additional workload to women during disasters or consider their active participation in every stage of disaster management plans and programs. The present study has used the philosophical notion of Ecofeminismto analyze these issues. It (Ecofeminism) has engendered a great deal of scholarly debate since its inception in the mid 1970s, when the term *ecofeminisme* was coined by Francoise d'Eaubonne in 1974. Ecofeminism refers to an important interconnection – historical, experimental, symbolic, and theoretical – between the domination of women and the domination of nature (Adams, 1993 cited in Howell, 1997; Mellor, 1997;Warren, 1990). Ecofeminists postulate that "the ideology which authorizes oppression such as those on race, class, gender, sexuality, physical abilities, and species is the same ideology which sanctions the oppressions of nature (Gaard, 1993:1 cited in Wang, 1999:2411). Ecofeminism also perceives that there is no distinction between patriarchal violence against women and violence against nature (Mies, 2005:199).

The authors of different disciplines have broadened the theoretical debate of Ecofeminism on practical system (Wang, 1999: 2411). Warren (1990) asserts that patriarchy devalued women. Men control all the resources and power and can subordinate the interests of women like by destroying nature. Situation of Bangladesh in this regard is not an exception. Patriarchal norms and values are institutionalized in rural society of Bangladesh (Ameen, 2005; Kabeer, 1994;Khan, 2001; Hofstede and Hofstede, 2005; Mahtab, 2007) where women are not allowed into extra household affairs and their participations are not expected in decision-making process at community and household levels. Then the question may arise, in such a situation how do rural women of Bangladesh participate in disaster management process. The present study is a step forward to investigate this matter.

However, some ecofeminists have advocated that social transformation is necessary for the sake of survival and justice. Social transformation must reassess and reconstruct values and relations toward equality, cultural diversity and non-violence in association, that are non-hierarchical, non-competitive and fully participatory (Brkeland, 1993:20 cited in Howell, 1997:233). Ecofeminism expects that power-based hierarchical relationship must be replaced with reciprocity and mutuality (Howell, 1997:233). In addition, gender issue should be integrated into policies, plans and programs in order to bring about gender equality within the given institutional framework (Matlin, 1998 cited in Saumier et al. 1999:5). This study also investigates whether there is any social transformation in terms of addressing gender issues in disaster management.

1.9.3 Socioeconomic Background Perspective

One of the objectives of this study is to examine the capability of women to participate in the decision-making process at household and community levels. As stated earlier, patriarchal norms and values restrict women's mobility, males dominate women as well as control all the power and resources, and social expectations of the role of women are extremely traditional and emphasis is given to child rearing and household management. Now the question arises: what enhances their participation? To address this issue, the present study has used socioeconomic backgrounds as theoretical concept for analyzing the capability of women to participate in disaster management activities.

Discussion of socioeconomic background perspective is based on theoretical notion of empowerment theory advocated by Kabeer (2001 & 2005). The concept of empowerment is deeply rooted in the notion of power and powerlessness or absence of power. Emphasizing power relations Kabeer (2005:13) states that "empowerment refers to the processes by which those who have been denied the ability to make choices acquire such ability." It encompasses strategic life choices and participation in decision-making, policy formulation and implementation at organizational level. Socioeconomic backgrounds, referred by Kabeer as resources, are the conditions under which choices are made. Resources not only mean the conventional economic resources, but also the various human and social resources that enhance the ability to exercise choice. Human resources encompass the individual's knowledge, skills, creativity, and imagination and so on. Social resources, on the other hand, are inherent in relationship, networks and connections which prevail in different spheres of life and which enable people to improve

their situation …. (Kabeer 2001:20). Socioeconomic backgrounds such as education, training, membership of organization (involvement with politics/NGO), participation in economic activities etc. create confidence, capacity and self-esteem of a person to interact in public spheres (ADB, 2004; Frankl, 2004; World Bank, 2008). The study, therefore, examines whether the socioeconomic backgrounds of women enhance their participation in decision-making process in disaster management.

It has been stated earlier that against the backdrop of Dominant Approach to combat disasters effectively, South Asian Network for Disaster Mitigation has proposed Alternative Perspective. Like other countries, the Government of Bangladesh has also adopted disaster management policy in tune with the philosophical notion of Alternative Perspective, where participation of all stakeholders in disaster management process is overwhelmingly emphasized. The immediate objective of Alternative Perspective is to introduce community-based disaster management (CBDM) program in order to build disaster-resilient community. Since the Government of Bangladesh is committed to ensuring participation of all stakeholders in policy adoption to implementation of CBDM program, the study investigates to what extent the community, especially women, has active participationin the CBDM program.

However, Bangladesh is predominantly a patriarchal society, where women's mobility outside their home-vicinity is quite restricted and their participation in decision-making process is unacceptable. Men dominate women in every sphere of life. But the Ecofeminists expect that in course of time this value will be transformed into reciprocity and mutuality. Hence, the study examines whether male attitude towards women has changed and women's participation in decision-making at household and community levels is accepted. Or men still dominate women like in earlier times and women abide by the order of males likewise.

With regard to influence of resources on human behavior literature shows that resources – whether material or non-material – create confidence in the actors and affect their behavior from individual to community levels. Thus, the research looks into what happens in the study area. Is there any influence of socioeconomic backgrounds of women on enhancement of their participation in disaster management activities? The study examines the role of socioeconomic backgrounds such as age, education, household income, landownershipand organizational involvements in enhancingtheirparticipation.

1.10. Organization of the Thesis

The present study consists of nine chapters followed by a reference section. At the end, appendices have been included for further information on some issues. A brief outline of the chapters is as follows:

Chapter I introduces the reader to the research problem and reasoning of the study leading to objectives and assumptions. It has also presented theoretical framework by describing the main theme of the theories and their implications in this study.

Chapter II provides a detailed review of literature related to disaster management. The background information helps us to understand the contemporary situation related to the study of disaster management and the role of stakeholders. It also identifies research gaps that have been addressed in this study.

Chapter III attempts to discuss the methodological approaches used in this study. Research approach, research strategy, methods and techniques of data collection etc. have been discussed here with logic behind using a particular approach or techniques. This chapter also sheds light on data analysis approaches and reasons for using both quantitative and qualitative approaches. In addition, a brief description of validity and reliability, ethical issues and limitations of the study have been presented here.

In chapter IV, general information of the study villages has been discussed. Geographical location of the study villages, land characteristics and productivity, transport and communication system, flood situation, control over resources, market-based activities and marketing outlet, employment opportunity, basic needs situation, social situation with reference to practice of *purdah* and women's position, women's involvement in income-generating activities have been discussed here.

From the personal and household information provided by the respondents, socioeconomic and demographic issues have been identified in Chapter V. The respondents and their households have been divided into different categories and their

relationship with women's participation in disaster management has been examined in the subsequent chapters.

Chapter VI deals with the preparedness mechanisms and the role of the stakeholders. It provides an account of the roles of GAs and NGOs to make the study area disaster-resilient. It describes the structural and non-structural measures adopted at the community and household levels. It also provides an understanding about the gender-specific role of the flood-affected people in preparedness phase and relationship between socioeconomic status and women's participation in disaster management activities.

Chapter VII explores the indigenous coping strategy the people adopted to combat flooding. It provides an understanding how the flood-affected people, neighbors and GA-NGO respond to extreme floodwith a brief operational definition of response and coping strategy. It also identifies the gender-specific roles in response to floods. It examines the contribution of GAs and NGOs in addressing problems encountered by the flood-affected people. Like in the preparedness phase, this chapter also identifies the relationship between socioeconomic status and women's participation in disaster management activities.

Chapter VIII identifies the problems encountered by the people after floods, explores the adaptation strategies of the people at household level and the nature of GAs-NGOs supports in recovery from flood induced crisis. It also identifies the gender differentials in roles performed by men and women. Relationship between socioeconomic indicators and adaptation strategies has also been investigated in this chapter.

Finally, Chapter IX focuses on the outcomes of the above chapters. It discusses and synthesizes the key findings and conclusions based on empirical findings, and also offers a range of suggestions to formulate a useful community-based disaster management planning for Bangladesh. However, the chapter ends with summery of the findings, recommendations, areas for further studies and conclusions.

Chapter II
Review of Literature

2.1. Introduction

This chapter deals with the review of literature relevant to disaster management and identifies research gap to be filled in this study. It is found that there have been quite a lot of studies conducted in recent years in Bangladesh on various aspects of disaster and disaster management such as impact of flood and other disasters, coping mechanisms with disaster, and climate change and adaptation strategies. But studies on "community-based disaster management emphasizing gender issues" are very few. The researcher has reviewed studies available so far which are relevant to disaster management, especially which are devoted to community participation and gender issue in disaster management. In the present research context, the available studies on disaster management that have been reviewed are divided into three groups on the basis of their main focus: (i) studies related to impact of disaster and coping capacity, (ii) studies related to coping mechanism of disaster-affected people, and (iii)studies related to gender issues in disaster management.

2.2. Studies Related to Impact of Disasters and Coping Capacity

Abrar and Azad (2004) in their study entitled *Coping with Displacement: Riverbank Erosion in North-west Bangladesh* analyzed the existing warning system in Bangladesh, emotional state of victims, consequences of riverbank erosion and coping capacity of the victims. They employed both qualitative and quantitative approach to analyze the primary and secondary data. They observed that there was no existence of early warning system in the study area, but the local elders constituted a pool of knowledge and could predict the occurrence of river erosion, and this type of indigenous knowledge could be helpful in overall capacity building of the local people. Although people remain alert to river erosion, sometimes they do not want to move from their residence due to emotional attachment as well as lack of financial support. The study did not find any instance that the displaced people were prepared for facing the disaster. However, they face food insecurity during and in the aftermath of disaster. As a result, health and nutritional status

of the victims decline abruptly. They also do not get proper sanitation facilities at new places. As a result, unhygienic sanitation practices affect the health status of the displaced people. It isalso found that women suffer more than men due to longstanding social values of Bangladesh. Although the study focused on sufferings of women, it did not highlight the crying needs of women during and after the disaster event and their participation in managing disasters. However, the study pointed out that in spite of providing financial supports by the government and non-government organizations (NGOs), the displaced people become compelled to depend on borrowing from relatives, friends and *mahajans*since the organizational assistance is very poor. It is obvious that the study is simply concerned with analyzing the impact of riverbank erosion, but it did not put in any efforts to highlight women's role in preparedness and recovery phases of disaster management.

A study entitled *A Comparative Analysis of Different Types of Flood Shelters in Bangladesh* conducted by Bangladesh University of Engineering and Technology (BUET) and BRACUniversity (2010) examined the effectiveness of various types of flood shelters of Bangladesh in reducing disaster risk from socioeconomic, cultural and technical points of view. Data were collected by using focus group discussion (FGD), group consultation and transect walks and case study methods. The study found there are three types of flood shelters in the study area viz. raised homestead, community flood shelter and school-cum-flood shelter. But the people are reluctant to move to shelters in the event of short duration floods. In addition, sometimes water and sanitation facilities remain unavailable at the community flood shelters and school-cum-flood shelters. There is also a possibility for adolescents to be abused that also create reluctance among the victims to take refuge in shelters. However, which type of the shelters is the best suited depends on the location of an area and availability of required facilities. In *char* areas, RCC structures are not usually constructed. In this circumstance, raising the individual homestead level can be regarded as the best available option. But from the multipurpose use perspective, school-cum-shelter is a more preferred option, and management is easier here compared to the other two-types, as schools have year-round activities and fund is unavailable for shelter maintenance. On the other hand, in terms of space, community shelters are preferable since people can take refuge along with their livestock and other physical assets. Therefore, from the cost-effectiveness point of view, it is very difficult to name one single shelter as the most appropriate. Each of these shelters has some distinct

advantages that cannot be replaced by others. But people prefer a raised homestead to other options, because raised homesteads save both their lives and belongings. Although the study focused on shelter facilities, it did not analyze the problems created by flood for vulnerable people, and the roles of men and women during disaster and in the aftermath of disaster for recovery phase.

Elahi (2001) in his study on *Drought in Bangladesh,* based on both primary and secondary data explored the terrible situation of drought, impacts of drought and provided some recommendations to combat the drought situation. He observed that drought causes damages to crops, lives, and livestock and it creates shortage of food, cattle food, diseases and price-hike of essential goods. Coping mechanisms adopted by draught-exposed people, have been also discussed in this study. The researcher noticed that drought-exposed people usually take help from relatives, friends, and also from the administration as a coping strategy. But they also feel compelled to sell land, lease out land and sell other valuable assets to cope with the natural hazard like drought that reflects the vulnerability of drought victims. The author concluded with some recommendations as long-term adaptation strategies such as large-scale tree plantation, establishing reserve forest area; besides ponds, rivers and canals should be re-excavated and drought monitoring center should be established. But gender issues and role of women in combating droughts have not been highlighted in this study.

Haider, Rahman and Huq (1991) in an investigation titled *Environmental and Perceptional Perspective of Cyclone '91* assessed the environmental situation and perception concerning cyclone of the victims after the disaster. The study revealed that in spite of disseminating warning about the approach of cyclone, people's response to warnings was too poor to be evacuated with their livestock and other valuables to cyclone shelters and other secure places. The reason behind poor response was disbelief in warnings, because since the 1970 Cyclone, many warnings had been issued, even the 'Great Danger Signal Number 10', but nothing serious had happened. However, the Cyclone 1991 caused large numbers of casualties (1,38,000 people); large areas were submerged by saline water that created soil salinity, all species of mangrove and homestead forests were devastated, standing crops were damaged, water of all sources for household use was contaminated with salinity, and livestock, houses, fishing farms were washed away and many people lost their jobs and livelihoods.

In spite of many disadvantages associated with coastal occupancy, most residents expressed willingness to continue their living in coastal areas due to the fatalistic attitude towards the environment along with the absence of any other choice. The study found that although people said they should take refuge in cyclone shelters, they did not do so due to 'disbelief'. They adopted some tactics to cope with the situation that included drinking coconut water till the first relief arrived; floating on bamboos, logs, branches and taking shelters in trees, sitting on rooftops of two-story buildings or on tin or thatched roofs. The study revealed that many women and children died may be due to lack of decision-making by the women in leaving their homes, the mother's protective instinct whereby she died trying to save her child, and the hazardous *sari* which hindered her movement in the tidal waters. They were also disadvantaged in access to relief facilities. Hence, the issues of women and children have to be considered in disaster management. Although the study explored the impact of cyclones, especially on women and children, it did not focus on community participation in preparedness and recovery phases of disaster management.

Juthi (2003) in her study on *Flood-2000* identified the causes of flood and proposed solutions based on the opinions of the affected people. She observed that heavy rainfall of 17-19 September 2000 in Bangladesh and India was the main cause of that flood. Siltation of different riverbeds also caused the flood. The flood damaged crops, houses and communication system severely. She also found community-based organizations (CBOs) and members of civil society took initiatives to combat the situation. After taking shelter in safe places they formed committees for management of shelters resulting in maintaining an acceptable situation. They also took initiatives to drain out the stagnant water. But the affected people think that information management should be developed and the people should be informed as early as possible about occurrence of flood through mass media, as well as through informal communication system. River management should also be developed and rivers must be re-excavated. It should be noted that although the study focused on the impact of flood and community organization activities to cope with the situation, it did not address the women's needs and problems and their role in combating serious natural events like flood.

Nino, Smith and Roy (2004) in their study titled *Impact of the 1998 Flood on Household Food Security* identified the impact of the 1998 flood on food security at the household

level by using survey data. The authors examined how the poor people are affected by flood, nature of coping with food security and response of GOs and NGOs in preventing major food crises during and after floods. Data showed that income of flood-exposed people declines due to flood that directly impacts on food security. There were shortage of supply of food grain and vegetable on one hand, and the people had to increase expenditure for health care and were unable to spend on food on the other. Consequently, the people of flood-affected areas suffer from food insecurity and individuals in all age-groups, especially severely flood-exposed poor people, experience deterioration in health status. However, school-going children were severely suffered from diarrhea, malnutrition and less-weight due to food insecurity. The researchers also noticed that the flood-exposed people adopt different types of strategy to cope with flood, such as reallocating their expenditure bundles, selling assets and borrowings that lead to debt burden. Thus, they remain vulnerable to further shocks. The authors concluded that to reduce negative impact of natural disasters, effective policy adoption and allocation of increased resources are badly needed. But they did not focus on the impact of disaster on women and their role in preparedness and recovery.

A study titled *Cyclone Aila (25 May 2009): Initial Assessment Report with Focus on Khulna*Roy et al. (2009) assessed the damage, livelihood and the aftermath of *Aila* based on primary data collected through interviews, focus group discussions and observations. Secondary data were also collected through consulting government document and published reports in national and local dailies. The researchers found that death toll was 296 in the affected area of which 109 were from *Koyra* and *Dacope upazila* of *Khulna.* Cyclone *Aila* inflicted a heavy damage on coastal livelihoods. Food security was badly broken down due to the cyclone. Supply of pure drinking water, dry food and providing with proper medication were higher priority sectors in assistance. The authors also confirmed that there was a dire need for proper sanitation facilities that badly affected the people's life in the coastal area. The hard hitting *Aila* destroyed homestead, road communication and embankment. Though the authors assessed the impact of *Aila* on mass people, unfortunately the study did not address the gender issues such as the needs of women, their coping techniques concerning natural catastrophic events and the nature of their participation at household and community levels in adopting policy, plans and programs to combat natural disasters.

Selvaraju et al. (2006) assessed the effects of climate change and adaptation strategies in a study called *Livelihood adaptation to climate change in drought-prone areas of Bangladesh,* with special reference to agricultural sector. The authors examined the impact of climate change on agriculture sector and explained the livelihood adaptation strategy of the victims of drought on the basis of qualitative data collected through focus group discussions (FGDs) and participatory rural appraisal. The authors also used quantitative data to present economic condition of the respondents. In addition, a climate modeling approach was also employed to estimate potential climate impact. The study revealed that high temperature and higher rates of evapotranspiration will create further water stress condition, and irrigation projects will be hampered. As a result, agricultural productionwill decline in drought-prone areas. However, people in the study area perceive that today's climate is different from the past – the seasonal cycle and pattern of seasons have changed, droughts have become frequent, temperature has increased in the summer and it has become longer, and winter has been shortened. Agricultural production has been severely affected by climate change. But the study did not put any effort to find out the impact of climate change on women and women's role in combating climate change.

Another study titled *Climate Change: Impacts and Adaptation Strategies of the Indigenous Communities in Bangladesh* (Sen et al. 2009) assessed the impact of climate change and evaluated the adaptation strategies adopted by indigenous communities in Bangladesh. The study is based on primary data collected through interviews, FGDs, participant observations, and participatory rural appraisal as well as on secondary data collected by consulting related literatures and official documents. The authors found that the natural seasons have changed. Because of high temperature, summer is getting warmer and longer day by day. The gentle breeze does not flow like in the past and rainfall has decreased. This situation affects the livelihood of indigenous community. The respondents opined that due to climate change, frequency of natural disasters like drought, hailstorm, heavy fog, has been increased, which affect the livelihood of the people of indigenous communities. It is found that climate change has adverse effect on agricultural production. Due to drought, reduced rainfall, and unusual floods production of rice, vegetable, betel-leaf etc. has declined. The situation also created unemployment in the study area. Climate change also causes outbreak of several diseases such as diarrhea, fever and black fever, malaria, skin disease etc. Cultural tradition and age-old rituals

have also changed because of climate change. The indigenous community adopts various types of strategies to cope with climate change. They cultivate new types of paddy, make their houses by adopting new techniques, preserve seeds and crops, and use compost fertilizer to protect soil and environment from pollution, preserve water in pond for irrigation, and in tank for household use during dry season. The authors believe that these indigenous adaptation tools and means of livelihood of the indigenous communities could contribute much to enable other communities to further mitigate losses and risks of climate change. But the gender issues were not dealt in this study. Some important issues such as the impact of climate change on women, tactics of coping with the changed situation, attitude of community toward addressing women issues are absent in this study.

2.3. Studies Related to Coping Mechanism of Disaster Affected People

BangladeshCenter for Advance Studies (BCAS) and Bangladesh Environmental Lawyers' Association (BELA) (n.d.) in a study titled *Adaptation Practices of Drought & Flood Affected People in Bangladesh* documented the existing coping strategies in relation to natural disasters, particularly flood and drought. Basically, it is an assessment of the projects which are being implemented by GOs and NGOs for adapting to drought and flood. The study has identified some practices that are applied to cope with drought such as: deep-water irrigation, homestead gardening, tree plantation, supply of drinking water, canal re-excavation, awareness raising and training. On the other hand, flood-exposed people, GOs and NGOs apply some techniques for adapting to flood vulnerability such as construction of embankment, *kasban* (catkin) plantation in *charlands,* and tree plantation in other areas for flood protection; community-based seed conservation for post-flood cultivation, relief distribution for flood victims, providing healthcare services, construction of community-based flood shelters and adopting fish farming. Unfortunately, some important issues such as gender needs, participation of women as well as community attitude towards women's participationin disaster management process area not focused in this study. In fact, the study is solely confined to examining the effectiveness of GO and NGO run projects for adapting to drought and flood.

Another study titled*Flood '98: Relief, Rehabilitation and Management,* conducted by Khuda and Nizamuddin (2000), assessed the emergency relief program undertaken during and after flood, based on primary data collected through questionnaire survey and secondary data. Findings showed that about 49 percent respondents received relief from

GAs and NGOs to cope with the situation. Some of them received relief from more than one agency, but some did not receive relief even for once which affected the rehabilitation process. The study pointed out that although different agencies feared epidemics and famine would follow, timely intervention and massive relief programs helped in avoiding such catastrophes. Data collected from elite of the study area showed that relief operation was undertaken in every village though it was inadequate compared to necessity, but it was quite disciplined. The authors observed that although different types of diseases broke out, the death rate was low because of providing necessary health services to people. The government took a large step to mobilize resources to implement its post-flood rehabilitation program. The government collected money from different service sectors and curtailed its own expenditure. The poor people were provided with food grains under vulnerable group feeding (VGF) project for ensuring food security. The government also distributed test relief, expanded food for work (FFW) program, sold rice in low price under open market sale (OMS) program, and provided collateral-free loan to the poor or marginal farmers. With a view to reducing food gap, the government also took initiative for agricultural rehabilitation. The study concluded that as a natural phenomenon, flood could not be prevented but the damages could be reduced by taking some measures. The study recommended that the warning system should be made effective, relief materials should be distributed as early as possible, necessary steps should be taken for coordinating the programs and controlling price hike, and the structural program should be expanded to prevent flood as far as possible. Although the study has dealt with various aspects of coping mechanism, the fact is that the issue of women's rehabilitation as a vulnerable group and their role in managing disaster are absent in this study.

Islam (2008) in a study called *Role of Microfinance Tools in Disaster Risk Reduction: A Study in India, Bangladesh and Sri Lanka* (Bangladesh Country Report) evaluated the role of microfinance in reducing disaster risk on the basis of quantitative and qualitative data collected by employing multiple methods of data collection such as survey (interview), FGD and various tools of participatory learning methods (PALM). The study found that disasters have some common negative effects on households; poor households remain stuck in stressful conditions, either during disasters or in post-disaster situation in particular. They depend more on themselves, and on community-coping mechanism than on any public or private assistance because both government and microfinance

institutions provide little support to the people to prepare for the onslaughts, or meet the rehabilitation needs of the disaster victims. The study observed that poor people of disaster-prone areas tend to increase their levels of borrowing to fulfill their daily demands. As microfinance institutions do not offer any product for the victims, they heavily depend on their savings or local moneylenders that seriously affect the future life of poor people. The study suggested that improvements in managing disaster risks have to be related to experience of fighting disasters with preventive measures. The policy interventions should be aimed at preventing damages of assets, and the changing risk profile facing disaster-exposed poor people in Bangladesh should be taken into consideration in formulating disaster management policy. But it is a matter of regret that the study did not take into accounts the gender issues and community participation in the phase of post-disaster recovery.

Majeed (2009) in a study on *Integration of Ecosystem Management in Livelihood Restoration After Disaster* examined the role of the existing initiative adopted by local people to cope with the situation after disasters, local institution interventions in restoring livelihood, and the possible options of ecosystem management approach in livelihood restoration. The researcher employed participatory learning approach (PLA) to analyze the research issues. Five coping strategies for dealing with disaster such as land use change (crop types), change in resource management (rearing livestock, savings), change in labor allocations (migration), changes in market relationship (reciprocal or local exchange) were identified in this study. The author noticed that ecosystems have undergone various short-term and long-term cyclical changes due to frequent disasters, unplanned development efforts, and management practices of local institutions over time. The dynamic interaction between livelihood and ecological system has also been demonstrated in this study. It is evident that a livelihood capital varies with geographical locations and profound influence of disasters with dearth of capitals, and lack of coping and adaptive strategies. Each time disaster exacerbates its impacts on environmental elements and vice-versa, it affects natural processes, alters resource base, and increases vulnerability of at risk communities. Therefore, environment and disaster management programs should be integrated with implementation practices of sustainable livelihood and other disaster risk-reduction options. Although the researcher emphasized ecosystem management approach, he did not mention the approach to implant ecosystem management and the role of various stakeholders, women in particular.

However, Morshed (2007) in a study titled *Indigenous Coping Mechanisms in Combating Flood* examined the efficacy of indigenous knowledge possessed by the people of flood-prone areas to cope with this calamity. The researcher identified the indigenous perception of local people at disaster, examined the prediction capacity, made out the livelihood pattern and coping mechanism during and after floods, and examined the ability of the respondents to understand the recovery needs and future needs. The author observed that households in rural Bangladesh employ a variety of strategies to cope with shocks, including economic, political and socio-cultural ones as well as natural disasters such as flooding and cyclones. The poorest households tend to employ adaptive coping strategies far more frequently than done by non-vulnerable households. Most households employ a few common coping strategies during different periods of time of the year or in response to shocks or abnormal events, for example, limiting portions at mealtime, consuming cheaper and less preferred food, borrowing food, purchasing food on credit, reducing adult consumption and so on. Many people also sell labor, borrow from others, and GOs and NGOs offer relief as emergency response. However, the people of the study area are enriched with indigenous knowledge regarding flood, and they could predict about the nature of flood by looking at the pattern of rainfall, water levels in rivers or behavior of snakes, frogs, ducks, and other animals. However, the flood forecasting messages do not reach the affected population on time and in the technical term and language they understand. As a result, they have to combine the media reports with their perception and contact local leaders. The people either leave their residence or raise platform inside the dwellingsto save their lives and livelihoods. It was also observed that the people with disabilities suffer more because they cannot earn their living. The researcher also identified the problems of children, the disabled, and women and concluded with some recommendation such as flood warning system should be developed using local language; and the coping capacity should be incorporated for strengthening mitigation measures, and the coping mechanism should be based on local vulnerability. But the researcher did not present any role of women in managing disaster and analyze findings from any theoretical point of view.

Talukder et al. (2008) in their study on *Community Perspective on Water and Sanitation towards 'Disaster Risk Reduction'* explored the perception of selected communities on impacts of disaster on water and sanitation (WatSan) with a perspective of 'Disaster Risk

Reduction.' The authors observed that disasters like cyclone and flood drastically destroy WatSan facilities. It imposes a huge financial burden on the respondents as they are not financially solvent enough to rebuild the damaged latrines and other structures. There was a severe shortage of safe water during and after the disaster. As a result, most of the people of disaster-exposed area were suffering from different types of water-borne diseases during field-work of this study; among them children, older people and women were affected more than the other groups. But it is the matter of surprise that there was no mention-worthy technology that can ensure disaster risk reduction in the flood-prone or coastal areas. Butinstallation of tube-wells and construction of the latrines at the higher place of homesteads might be helpful. However, female participants of FGDs opined that the technology to ensure Disaster Risk Reduction has to be 'women friendly', as they collect water for household use. They also emphasized inclusion of women in the training for maintenance of the new technology in order to be formed on how to prevent disaster risk. However, the study did not focus on male attitude toward women's issues in reducing disaster risk.

2.4. Studies Related to Gender Issues in Disaster Management

Farzana et al. (2004) in their study titled *Community Based Haor and Floodplain Resource Management: The Gender Perspective* highlighted gender issue in wetland resource management. They explored the global and national commitment for women development; and identified the problems facing women in study area and recommended measures to mitigate these problems. The authors observed that the prevalent patriarchal norms and values affect the behavior and movement of women. Women of the study area are engaged in various types of activities such as child rearing, fuel collection, and water collection that are reflection of gendered division of labor. Women of fishing community are involved in catching fishes, and related activities such as making fishnets and bamboo traps, processing drying fish and selling fish in the market in addition to the daily household chores. Women are also involved in all stages of crop production, cattle rearing, poultry rearing and duckery and handicraft. But they face different types of problems such as scarcity of safe water, scarcity of fuel, malnutrition, lack of proper sanitation, depletion of natural resources, erosion of homestead, lack of alternative income sources, and lack of decision making power. Findings show that women in the project sites play a very significant role in natural resource management. They are involved in management of seed (paddy, oil plant, wheat and different types of fruits),

management of biomass energy (fuel wood, twigs, leaves), and homestead forest management, homestead gardening that have economic and food values (beans, leafy vegetables, papaya, banana, mango etc.), and water resource management. Furthermore, women have to manage various emergent crises viz. food and water scarcity, shelter and health hazards. But they face a lot of problems, especially financial crisis, in doing so. However, though the researchers highlighted women's functions in wetland management, it did not focus on whether women's problems are addressed adequately.

Nasreen (2001) in her scholarly article titled *Coping Mechanisms of Rural Women in Bangladesh during Floods: A Gender Perspective* highlighted survival methods of rural women in Bangladesh from gender perspective. The author's explanation is based on primary data of a longitudinal study carried out from 1992 to 1998. She found that during floods women face different kinds of problems. Poor women suffered from lack of food, clothing, and shelter. Women take the responsibility of protecting their houses, children and other members of the family, livestock and other belongings. Traditional gender-specific works become difficult for them, but males do not assist them because of age-old ideas of gendered division of labor. Women bear more physical burden of coping than men. The researcher identified some problems which women face in flood shelters such as those of cooking, shortage of fuel, feeling of being insecure, and failure to maintain *purdah*, insufficient toilet facilities, fear of snakes, frogs, mosquitoes and other insects, problems of transport, problems of water collection and many others. But the author did not compare between the situation of 1992 and that of 1998. The study also did not highlight women's participation in decision-making process of disaster management both at household and community levels.

Nizamuddin et al. (2001) in their scholarly article titled *Women Headed Households Displaced by River Bank Erosion: Problems and Strategies of Survival* explored the problems created by riverbank erosion and survival strategies of the women-headed households. They found that the respondents face different types of problems such as unemployment, low-wages, lack of medical facilities, malnutrition, insecurity of life and property, lack of privacy, education of children, access to institutional credit etc. In terms of coping with financial crisis, the respondents take loan from relatives or friends. Even they take loans from moneylenders with high interest rate. Sometimes they cut down their food intake. They also cannot avail proper treatment due to lack of financial support.

However, the researchers observed that the respondents try to cope with insecurity by themselves. Sometimes, they approach the neighbors and relatives for help. But they hardly approach the chairman of the Union *Parishad* (the lowest tier of rural local government of Bangladesh) and police for coping with natural disasters like river erosion. The authors argued that income generation activities have to be expanded to enhance coping capacity, and protection has to be given to women-headed households to protect them from violence. Although the problems of women-headed households have been highlighted with utmost importance, women's role in disaster management plans and programs does not get any importance in this study.

Siddika (2008) conducted a study titled *Women's Livelihood Resilience and Adaptation Options for Climate Change,* in which she analyzed the livelihood options for women in flood-exposed area, made a link between threat of climate change and women's livelihood; and identified the mitigation and adaptation options. The participatory rural appraisal (PRA) method has been used in this study as principal method of data collection. Data were also collected by employing FGD and case studies. The authors observed that women of the study area perceive that different types of floods – flooding, higher frequency of flooding and sudden flooding are the outcome of climate change. Women are facing threat of extreme poverty due to loss of income and damages of crops and other properties. As a result, their vulnerability is growing at alarming rate due to climate change impact on agricultural sector. The community copes with flooding by changing food habits, diversion of income option and depending on credit loan from NGOs or local moneylenders. But women's role and long-term adaptation tactics with climate change has not been explored in this study.

2.5. Identified Research Gaps to be Filled

It is found in the aforementioned discussion that there have been ample studies on impact of disaster on livelihood process, coping mechanism of local people, but we have found only a few studies on community participation and gender issues. None of the studies dealt elaborately with community-based disaster management. Although Nasreen (2001), Nizamuddin et al. (2001),andSiddika (2008) focused on gender issues, their efforts are confined to identification of women's problems and their short-term coping mechanisms; but the matter of women's participation in adopting disaster management plans at household and community levels, influence of patriarchal norms and values on their

participation in disaster management and the factors that enhance their participation are not investigated. The present study, therefore, focuses on the above-mentioned research gaps, that is, to what extent women participate at household and community levels in decision-making process regarding formulating disaster management plans and programs, how the patriarchal society of Bangladesh accepts their participation at decision-making and implementation levels, and the relationship between resources (material, human and social) and their participation. Specifically, the study investigates and explains how gender issues are taken into account both at intra-household and inter-household levels in a triangular interaction of traditional gender norms, socioeconomic background of respondents and disaster management intervention. In addition, none of the authors mentioned above used any theory in analyzing their findings. But Alternative Perspective, Ecofeminism and Socioeconomic Background Perspective of Empowerment Theory advocated by Kabeer (2001 & 2005)have been employed in this study in analyzing research findings. In this respect, the present study is different in nature in the field of gender and disaster studies. The research may open a new avenue to further research.

Chapter III
Methodological Approaches

3.1. Introduction

This chapter provides an outline about the methods employed in this study with strength as well as logic of using some methods in accordance with the research problem. Methodological approach of this study is inspired by Silverman's (2005:99) observation: "methodology refers to the choices we make about cases to study, methods of data gathering, forms of data analysis etc. in planning and executing a research study." But it is not possible to simply choose a method and adhere to it in research study because of some limitations of a particular method. Therefore, this chapter discusses the relationship between the various parts of the research project, the implication of the choices made and the limitations of the methods chosen.

3.2. Research Design

The main purpose of this study is to understand and analyze gender issues in community-based disaster management practices embedded in rural Bangladesh. Moreover, emphasis have been put on identifying problems of the flood affected people, in particular women, their participation in disaster management process and examine the influence of social values on their participation from gender perspective. The study is inclined to explore some social issues related to community-based disaster management, with special reference to pre-disaster, disaster and post-disaster situation. Therefore, it followed non-experimental research design. Although an experimental design was supposed to be more appropriate for assessing/examining the cause effect relationship of education, training, landownership on participation in community-based disaster management, the study simply described the influence of these social indicators along with implications of religion and gender ideology in their participation.

3.3. Research Approach

Mixed method approach was followed to pursue the research work. The reasons behind using this approach lay in merits and demerits of qualitative and quantitative approaches.Basically, quantitative approach is such an approach in which the investigator primarily uses post-positivist claims for developing knowledge, employs strategies of inquiry such as experiments and survey, and collects data on predetermined instruments

that yield statistical data (Creswell, 2003:18). It is also concerned with correlation between dependent and independent variables, but could not go into the inner aspects of social phenomena. On the other hand, qualitative approach is one in which the inquirer often makes knowledge claims based on mainly constructivist perspectives i.e. the multiple meaning of individual experiences and meanings that are socially and historically constructed. It also uses strategies of inquiry such as narrative, phenomenology etc. The researcher collects open-ended and emerging data (ibid). "It provides a 'deeper' understanding of social phenomena than would be obtained from purely quantitative data," (Silverman, 2001:32 & 2005:10). But it could not make correlation or causal relationship between independent and dependent variables. Considering the advantages and limitations of both quantitative and qualitative approaches, the mixed method approach was employed in this study with using concurrent triangulation procedures as research strategy (Creswell, 2003:16) and social survey as strategy of inquiry.

Moreover, quantitative approach provides the frequencies of any observation but neglects interrelationship of verbal and non-verbal behavior and obscures the contingent nature of interaction (Mehan, 1979 cited in Silverman, 2001:36). But in exploring people's life histories or everyday behavior, qualitative methods may be favored. In the matter of flexibility, it encourages qualitative researchers to be innovative as events get unfolded. But in quantitative approach it is less likely since it is predefined. In addition, any research that follows a purely quantitative logic would simply exclude the study of many interesting phenomena related to what people actually do in their daily lives, whether at homes, offices or other public and private places (Silverman, 2001:25-31). In quantitative approach, researchers administer interview schedules or questionnaires to random samples of the population. 'Fixed-choice' questions, e.g. yes or no, are usually preferred because the answers they yield lend themselves to simple tabulation (ibid:13) that could not be able to explain experiences of everyday life. Therefore, the above-mentioned limitations and advantages encouraged the researcher to choose the mixed-method approach.

Nonetheless, both the quantitative and qualitative methods were integrated in this study to overcome the limitations that lie in using merely single method – whether it is quantitative or qualitative. Quantitative data such as age, income, landownership etc.

were collected through structured interview with closed-ended predetermined questions. On the other hand, qualitative data such as coping strategy with flood, participation mechanism in disaster management process at household, community and organizational (the Union *Parishad*) levels etc. were collected by asking open-ended question. In addition, quantitative approach employs survey method as strategy of inquiry that include the questions such as who, what, where, how many, how much etc. (Yin, 2003:5) in exploring social issues. The researcher asked the respondents some questions such as who took the decision regarding coping with flood, what types of problems they faced, where they took shelter, and who came to rescue them during last flood. On the other hand, qualitative approach collects open-ended data that are related to 'why' and 'how' questions. Since the primary intent of this study is to analyze real life events like people's participation in community-based disaster management, the researcher asked the respondents some questions such as how they cope with flood, how they, especially women, participate in policy adoption and implementation at household and community levels regarding disaster management; if they do not have any participation or very minimum participation, then why they do not participate in such activities. How do GAs and NGOs help the flood victims to combat the situation; if the answer is GAs and NGOs did not help them, then the researcher asked the respondents why they did not come forward to help them?

3.4. Research Strategy

Concurrent triangulation strategy was used as research strategy in this study in an attempt to corroborate the findings of qualitative and quantitative data. This strategy was also used as a means to offset the weaknesses inherent within one method with the strengths of others (Creswell, 2003:217). Both qualitative and quantitative data were collected concurrently by administering interview schedule composed of both closed-ended and open-ended questions where the respondents provided their oral statement describing their everyday life experiences. Although data were collected concurrently, field visits and informal discussion with the affected people and key informants (KIs) were made along with literature review before designing the interview schedule. Although both qualitative and quantitative data are very important in a study that follows mixed-method approach, priority was given to qualitative data considering the nature of the study as it is intended to exploring the everyday life experiences related to disaster management. The

results of the two methods have been integrated in every phase from data collection to interpretation of this study.

3.5. StudyArea

The study looks into the levels of people's participation, especially women's participation in disaster management activities of flood-affected areas, community attitude to their participation and barriers, if any. Therefore, the study area was selected from the most flood-affected areas of Bangladesh.Previous data show that plains of the mighty rivers, the Ganges and the Brahmaputra, that is, Gaibandha, Bogra, Jamalpur, Tangail, Manikganj, Sirajganj, Pabna, Rajbari, Shariatpur, Madaripur, Munshiganj are most flood-affected districts of Bangladesh (BBS, 2004:403-405). Although 68% area of the country is inundated in extreme years the people of the above-mentioned districts are affected by flood almost every year. Therefore, *Ajogara* village from *Sirajganj* district and *Chinadulipurbapara* (hereinafter referred to as*Chinaduli*)village from *Jamalpur* district were selected by using multi-stage cluster sampling procedure from the most flood-affected areas of Bangladesh as location for the present study. (Please see sampling section for details).

3.6. Population Framework

The study analyzes the nature of people's participation in different phases of disaster management, that is, pre-disaster, disaster and post-disaster situation, explores the problems of people created by flood, influence of prevalent social norms and values on their participationin disaster management process; and, therefore, all the male and female chiefs of the household of the selected villages, who passed at least five years' of conjugal life, were considered as population in this study. Each male and female chief of the household of aforesaid characteristics were considered as unit of analysis. However, there was no population framework in the two study villages. List of the households of these villages was not available either in the office of the Union *Parishad* or in the office of the *Upazila* Statistics Officer. Actually, because of river erosion and lack of livelihood opportunities some people are compelled to leave their village every year. Usually they migrate to other places (either villages or towns) for survival. Again, some people come back to their own village every yearand take shelter on roads or others' houses. As a result, there was no actual statistics of total households of the study villages during field work.

3.7. Sample Size Determination

It has already been mentioned above that the number of population of the study villages during field study was infinite because of different reasons. Therefore, the minimum required sample size was estimated at 384 (Ajogara: Male-96, Female-96 and Chinaduli: Male-96, Female-96) assuming 95% confidence interval as suggested by Fink (2003), Lwanga and Lemeshow (1991) and Sufian (1998). Apart from this, to avoid some difficulties such as missing of some information, overwriting of responses, and unwillingness to provide information, a sample size was determined with 10% over sample so that the responses from the minimum required number of sample could be ensured. Therefore, the total number of sample of this study was determined at 424 and the equal number of respondents was selected from each village according to sex (Ajogara: Male-106, Female-106 and Chinaduli: Male-106, Female-106). Although all of the samples were interviewed, 16 interview schedules were rejected after editing. For this reason, the valid number of samples of this study was 408. The number of respondents has been shown in the following table according to study village and sex.

Table 3.1: The number of respondents

Name of the villages	**Male**		**Female**		**Total No. of valid sample**
	Selected sample	Valid sample	Selected sample	Valid sample	
Ajogara	106	102	106	102	204
Chinadulipurbapara	106	102	106	102	204
Total	**212**	**204**	**212**	**204**	**408**

3.8. Sampling Procedure

In order to select expected samples, at first two districts: Sirajganj and Jamalpur were selected through simple random sampling procedure from the flood-affected districts of Bangladesh as two clusters. Then two *upazilas* (sub-districts): Belkuchi *upazila*from Sirajganj and Islampur *upazila* from Jamalpur were selected through following the same procedure. Finally two villages: Ajogara from Daulatpur union of Belkuchi *upazila* and Chinaduli village from Chinaduli union of Islampur*upazila*were selected through random sampling. Other flood affected villages of Daulatpur union under Belkuchi *upazila* were:

Meghulla, Jamtoil, Goprekhi, Atarpara, Gopalpara, Mamudpur, Teyashia, and Shardiyar; and other flood affected villages of Chinaduli union under Islampur*upazila*were: Fakirpara, Kadimtoli, Shekhervita and Pahlohanbari.Then the respondents were selected by using mixed method sampling procedure suggested by Teddlie and Yu (2007). At first 10 households were selected purposively from midpoint (apparently) of the study villages. Then one household was selected randomly from those 10 households. After that the rest of the households were selected from the houses situated after every one house from four sides of the midpoint and it continued until the selection of required number of respondents.

Apart from this, the chairman, members and women members of the respective union *parishad* were considered as key informants and data were also collected from them to understand their participation in adopting and implementing disaster management plans and programs. Moreover, members of *upazila* disaster management committee, union disaster management committee, and GA and NGO representatives were considered as key informants. (See Table 3.2 on page 45)

3.9. Sources of Data

Data of the study were collected from both primary and secondary sources. Primary data were collected from selected samples through interview, focus group discussion and non-participatory direct observation. Secondary data were gathered from published and unpublished research reports, journals, books, as well as from record and documents of the relevant agencies. The reason for using multiple methods of data collection from different sources was to increase the validity of data through triangulation (Yin, 2003:83).

3.10. Methods of Data Collection

The study is based on extensive field work carried out from July 2011 to October 2011. Primary data were collected from selected samples by using multiple methods of data collection with the aim of making triangulation. Denzin (1970) used the term 'triangulation' to argue for the combination of methodologies in the study of the same phenomenon. The concept of triangulation is based on the assumption that any bias inherent in particular data sources, investigators, and method would be neutralized when used in conjunction with other data sources, investigators and method (Jick cited in Creswell, 1994:174) in a similar study. This kind of triangulation approach was used in this study so as to eliminate any potential bias which may occur for using only one

method of data collection. However, data may be collected by using different methods such as face-to-face interview, questionnaire, mail questionnaire, focus group discussion (FGD), case study, participant observation, non-participant observation, direct observation, documentation etc. But which methods will be used depends upon the relevant research questions and not all of the methods will be relevant for a single study. Therefore, data were collected by using face-to-face interview, focus group discussion (FGD), non-participant and direct observationthat are relevant to the nature of the present study, and logic behind using these methods are discussed below:

3.10.1 Face to face Interview

Face-to-face interview was principal method of primary data collection of the present study. A pre-tested structured interview schedule, composed of both close-ended (predetermined) and open-ended questions, was administered for collecting data from the selected respondents. In addition, partial open-ended questions were also included in interview schedule in order to extract more information. The interview schedule was administered in face-to-face interview since most of the interviewees were supposed to be either illiterate or only can write their name. Although face-to-face interview was time consuming and expensive, it allowed the interviewer to hold a conversation with respondents about the theme (Kvale, 1996:30) of disaster management and their participation in this process to extract relevant data. It also allowed the interviewer to ensure clear understanding of the questions and better responses of the interviewee.

Apart from the above-mentioned interview schedule, different types of interview schedules and questionnaire were administered to collect data from key informants since the key informants in this study were from diverse groups (Table 3.2). As such, interview schedule which had both close-ended and open-ended questions was administered in face-to-face interview with male and female members and chairman of the Union *Parishad*(UP – the lowest tier of the three-tier rural Local Government System in Bangladesh) to understand their perception regarding impact of flood on rural livelihood, their participation in adopting and implementing disaster management plans and programs, and people's participation in disaster management process. However, a questionnaire was also administered for collecting data from the members of the *Upazila* Disaster Management Committee, UnionDisaster Management Committee, and other GA and NGO representatives who provide services to flood-affected peopleto understand how they (key

informants) address gender issue in disaster management activities. **However, the respondents offered their own perception and definition of particular activities and situation (Silverman, 2001:17) and developed their own thoughts and spoke in more detail about the research issues since open questions were included in interview schedule and questionnaire (please see appendices).**

Table 3.2: Categories and Number of Key Informants

Types of the key informants	Name of the organization	Number
Upazila Nirbahi Officer (President, *Upazila* Disaster Management Committee)	Belkuchi *Upazila* Islampur *Upazila*	1 1
Chairman of Union Parishad (President, UnionDisaster Management Committee)	Daulatpur Union *Parishad* Chinaduli Union *Parishad*	1 1
Women Members of the Union *Parishad* (Member, Union Disaster Management Committee)	Daulatpur Union *Parishad* Chinaduli Union *Parishad*	2 3
Male Members of Union *Parishad* (Member, UnionDisaster Management Committee)	Daulatpur Union *Parishad* Chinaduli Union *Parishad*	2 3
Other Government Officers (Union Social Worker, Project Implementation Officer {PIO}, Sub-Assistant Engineer {Public Health}, Fisheries Officer and Agriculture, Officer)	Belkuchi *Upazila*	5
Other Government Officers ((Union Social Worker, Project Implementation Officer {PIO},Fisheries Officer and Agriculture, Officer)	Islampur *Upazila*	4
NGO representative (*Manobmukti Sangstha* and National Development Program) who worked in the study village	Belkuchi *Upazila*	2
NGO representative (Eco-Social Development Organization and Social Development Foundation)	Islampur *Upazila*	2

3.10.2 Focus Group Discussions

Six focus group discussions (FGDs) were conducted in an attempt to arrive at an understanding about the extent of participation, and the role, skill and efficiency of the people in disaster management activities in rural Bangladesh. One FGD with male, one with female and another with the group in combination of both male and female respondents were conducted in each of the study village to collect data from natural settings.It should be noted that focus groups are "synergistic" in the sense that the group works together: the group interaction is explicitly used to generate dates and insights. The principal reason for choosing this method was that it offers an opportunity to see how ideas and language emerge in a more naturalistic setting than in-depth interview, and how they are shaped through conversation with others. It reflects the social constructions – normative influences, collective as well as individual self-identity, and shared meanings – that are an important part of the way in which we perceive experience and understand the world around us (Bloor et al. 2001). Data werecollected by using this method from a natural setting which also helped the researcherto access everyday language of the respondents that are used during and after flood. Through FGD sessions, data were collected related to problems during flood, their response to flood and coping mechanism with flood situation.

However, the reasons behind conducting joint FGD sessions were to understand male attitudes toward women and women's attitudes toward men in natural settings because in interview and FGD sessions (of either male or female) they had no counterparts. In FGD sessions the participants expressed their opinion more openly in natural settings. The objective of incorporating FGD as data collection method in this study was to make triangulation of FGD data with interview and observation. The number of participants in each FGD session was 7-9 but it was 10 (5 male +5 female) in joint FGD sessions, where the researcher played the role of moderator and kept the people on track and encouraged the participants in discussion (Neuman & Kreuger, 2003:286). On the other hand, a research assistant recorded the relevant information.

3.10.3 Non-participant Observation

Data were collected through non-**participant observation as it is also considered as a useful method of data collection that allows the researcher to capture variables and**

dynamics that would not be possible to grasp only through interviewing such as non-verbal behavior, body language etc. The researcher collected some social information, captured feelings and attitudes that were expressed by non-verbal communication including gestures and facial expression (Neuman & Kreuger, 2003: 374). Data were also collected by observing physical appearance of the respondents.

3.10.4 Direct Observation

Data relevant to research issues were also collected from direct observation. Hence, data were collectedfrom natural setting through direct observation by visiting study sites (Sufian, 2003: 96; Yin, 2003: 92) related to behavior and attitude of the people and social environment of study area, such as mobility of women, their participation in different activities, general attitude of people to women, practicing *purdah* etc. that assisted the researcher to analyze how the norms and values and social environment affect the people's participation in disaster management activities.

3.11. Data Analysis

Both quantitative and qualitative data analysis approaches were followed to analyze the collected data. Descriptive statistics method was followed in coding, editing and processing numeric data. Techniques of descriptive statistics (percentage and measures of central tendency) were used in analyzing data. Data have also been presented in tabular form along with developing bar chart and pie chart. However, it should be noted that raw data collected by using interview method were manipulated through a statistical software SPSS for windows. Both bi-variate and multi-variate analysis were followed and presented in cross-table. In some cases, chi-square test has been done to estimate the significant difference between gender roles in disaster management.

However, qualitative data analysis approach was also followed in analyzing qualitative data. It has been mentioned earlier that the concurrent triangulation strategy has been used in this study from data collection to interpretation phase. Therefore, data transformation process was followed to analyze the data. At first, data were organized into categories on the basis of themes, concepts or similar features (Neuman & Kreuger, 2003: 176) and codes were created to qualitative data to quantify (Creswell, 2003: 221) in order to count their frequency. In addition, other approaches to qualitative data analysis such as narrative description and explanation have been presented. Some long extracts of data as well as verbatim quotations from the respondents' oral statements have also been presented.

3.12. Reliability and Validity

Reliability and validity are inextricably bound up with the credibility of a studyas they are central issues in measurement (Neuman & Kreuger, 2003:177). Trustworthiness of a research report lies at the heart of these issues (Seale, 1999:266cited in Silverman, 2001:226). ***Reliability***means dependability and consistency. It suggests that the operation of a study can produce the same result under the very similar conditions (Neuman & Kreuger, 2003:177 and Yin, 2003:34). Reliability addresses how accurately one's research methods and techniques produce data. It refers to the degree of consistency with which instances are assigned to the same category by different observers or by the same observer on different occasions (Hammersley, 1992:67).

To maintain the consistency of quantitative data, representative reliability measurement was followed in this study to obtain quantitative data such as age, family size, income, land ownership etc. It is stated earlier that priority has been given to qualitative approach; hence, emphasis was given to maintaining reliability of the qualitative aspect. For that reason, interviews with pre-tested structured interview schedule were conducted in which open-ended questions were included along with closed-ended questions, and the respondents of the same category were asked the same question. However, in qualitative research, reliability is also associated with recording observations (Neuman & Kreuger, 2003:183) as concrete as possible including verbatim account of the respondents rather than researchers' reconstruction what Seale (1999:148 cited in Silverman, 2001:226) calls low-inference descriptors. As suggested by Neuman and Kreuger and Seale, for maintaining reliability of the qualitative data responses were recorded during data collection as concrete as possible including verbatim accounts of what the respondents said.

The term, ***validity*** means truth: interpreted as the extent to which an account accurately represents the social phenomena to which it refers (Hammersley, 1990:57). It refers to the bridge between a construct and the data. Truthfulness refers to the match between construct and measures that is how well the social reality is being measured. However, the study followed measurement validity and to maintain this type of validity conceptual and operational definition was given to some concepts, and questionnaire was designed to extract data to mesh with the definitions. Once more, to maintain statistical validity research sites were selected from the most affected areas randomly and descriptive

statistics were used to measure simple quantitative data at average and other measurement of central tendency. However, qualitative researchers are more interested in authenticity that provides a fair, honest and balanced account of social life from the viewpoint of the members of society who live in it. On the other hand, linkage between the construct and real world problem and insight of the respondents has been made. Some questions such as how they participate in preparedness, response and recovery phases of disaster management, how the gender issues are taken into account, if the answer was no, why gender issues were not taken into consideration, were asked to the respondents to make such types of linkages.

Validity may also be brought in qualitative research by comparing different sources of data where they corroborate one another. This form of comparison, called triangulation, derives from navigation, where different bearings give the correct position of an object. Though there are some problems of maintaining validity, Denzin (1970) suggested that by using multiple sources of data, that is, by making triangulation, validity may be maintained. The method of triangulation can serve to overcome partial views and present something like a complete picture. In this study, data were collected from natural setting by using multiple methods of data collection such as face to face interview, FGD, non-participant and direct observation, and established a chain of evidence by asking questions successively.

3.13. Ethical Issues/Concern

Social work research ethics suggested by Neuman and Kreuger (2003) were followed in this study. The interview schedules were examined by the faculty members of the Institute of Social Welfare and Research, University of Dhaka, to ensure that no question was included in interview schedules that could put the respondents, especially women, at risk. It was verified that the interview schedules did not create any harm to the respondents. Each of the respondents was informed about the purpose of the study and reasons for carrying out the research in their locality. Oral consents (Creswell, 2003; Neuman & Kreuger, 2003) were taken before starting interviews. The participants were informed that their participation is voluntary and he/she has no obligation to participate in interview sessions. They were ensured that the confidentiality of their identity will be maintained. Pseudonyms for the respondents have been used in the study report during narrating their oral statementsto maintain their anonymity. Moreover, for maintaining the

privacy of the respondents, two male and two female investigators who graduated in social sciences were appointed for data collection from male and female respondents respectively. They (investigators) were provided with training in research ethics, purpose of the study, and protocol of survey and unstructured questions so that they could collect relevant data in a proper manner.

3.14. Problems Encountered During Data Collection

The researcher experienced multidimensional problems during data collection. It should be mentioned that in some of the interviews, other members of the family were present at the beginning of interview session and tried to give answer in place of the interviewee. But they left the place after being informed in detail about the purpose of the study and the necessity of confidentiality. Although rapport was built with the respondents, sometimes the female respondents were found to be reluctant to answer some questions related to their participation in decision-making process and gender specification needs. Some of the people assumed that the researcher was preparing a list for distributing relief materials. Hence, they milled around the researcher making noise, but left the place after being convinced of the purpose of the interview. However, it was a great challenge for the researcher to complete a gigantic task like data collection from a large number of the respondents in a remote area as the communication and transportation system was not favorable for movement, especially in Ajogara. Moreover, the weather was hostile due to devastating flood and heavy incessant rainfall during data collection made the task more troublesome.

3.15. Limitations of the Study

For in-depth understanding, the study was conducted in a limited geographical area. Besides,due to time constraints and limitation of resources, it was not possible to include the entire flood-affected area of Bangladesh in this study. Moreover, the study explored problems of flood-affected people who resided in rural area, their participation in different stages of disaster management, constraints, if any, to their participation and identified the influence of socioeconomic background on their participation. But the study did not investigate these issues related to flood victims in the urban area. In addition, the study did not consider the above-mentioned issues related to the victims of other disasters such as cyclone, river erosion, drought, fire, building collapse etc.With regard to methodology, although a mixed-method approach was followed in this study, techniques of descriptive statistics were mostly applied to analyze quantitative data. Only in a few

cases techniques of inferential statistics (Chi Square Test and Non-parametric Correlation) were applied in analyzing data. Therefore, more studies may be undertaken on the identified areas that were not covered in the present study.

Chapter IV
Context of the StudyVillages and Their Surroundings

4.1 Introduction

The study area of the present research covers two villages such as *Ajogara* under *Belkuchi upazila*of Sirajganj District and *Chinaduli* under*Islampur upazila*of Jamalpur district in Bangladesh. The contextual features of thesevillages have been presented in this chapter. More specifically, this chapter gives an account of the geographical location,land characteristics, transport and communication system, occupational classification and other socioeconomic aspects of the study area.In doing so, data were gathered through direct observation;face to face interviews with the selected samples and key informants; informal discussion with villagers and consulting secondary sources. Data demonstrate the overall socioeconomic conditions of the sites and their susceptibility to frequent floods.

4.2 Location of the Study Area

Ajogara is situated in the eastern part of the *Belkuchi upazila*(sub-district) headquartersunder *Sirajganj*district. It is seven kilometers (kms) and 30 kms far from *upazila*and district headquarters respectively. The village is located beside the mighty river Jamuna and surrounded by water. Basically, it is one kind of a big *char* (land areas which are sand bar formed within a river) and detached from the mainland. On the other hand, *Chinaduli* village is situated in western part of the *Islampur upazila* headquarters under *Jamalpur* district. It is nine kms and 30 kms far from the *upazila* and districtheadquarters respectively. *Chinaduli* is also situated on the bank of the river *Jamuna,* but attached with mainland.

4.3 Land Characteristics and Productivity

The land in Bangladesh is of several types. Land of most of Bangladesh (90 percent) consists of alluvium. The soil of rest of the area is light loam and sandy. *Ajogara* bears similarity to the later partin respect of land characteristic. Soil of*Ajogara* is sandyand is not fertile as the village is located in char area. Consequently, productivity of this area is very low. It is very difficult to cultivate the land without irrigations in dry season (November to April). The villagersalso cannot produce rice or jute in rainy season due to over flooding. Now and then flash floods sweep away the growing crops. Despite the above-mentioned limitations, the people of *Ajogara* plant/sow flood-tolerant paddy and high yielding variety that they could harvest in advance in monsoon season and wheat, oil seeds, lentils etc. during winter (*robi monsoon*). On the other hand, the soil of *Chinaduli* consists of alluvium. Soils of some parts of the village are also loam-sandy. The soil in the area is fertile and suitable for all crops such as paddy, jute, mustard, wheat, pulses and vegetables. Although flash floods often sweep away the growing crops of this village, the degree of damages is less than that of *Ajogara*.

4.4 Transportand Communication System

A modern and well-organized transport and communication system is essential for continued socioeconomic development of any country. In the context of globalization and market-economy, it is extremely necessary to be connected with the regional and international transport and communication system. Therefore, it is important to build a well-knit and dependable transport and communication system in the country. However, various agencies of the Government of Bangladesh such as ministry of communication, local government, ministry of telecommunication etc. are playing an important role to bring about improvement in this sector (Ministry of Finance [MoF], 2013). But transport and road communication system of *Ajogara*, one of the study villages of the present study, is very poor as the village is a big *char* on the river *Jamuna* and disconnected from mainland by a channel. There is no *pucca*(concrete) road in this village. Eventhere is no road at all in some parts of the village. As a result, people of these areas create paths themselves through the vast land and sometimes (if crops remain in land) use the demarcation line of land for movement within the village during dry season. But they must use boats during flood as every place is inundated in almost every year. Even at the beginning of the rainy season, without getting one's feet wet it is not possible to reach one house to another if it rains.

However, it becomes very difficult for the people of *Ajogara* to go to the mainland and return home during floodswhen there are fierce storms accompanied by high waves and torrential rain. Besides, they are to use boats in the year-round to go tothe mainland as the village is surrounded by water. On the other hand, plying of vehicles and transportation system of *Chinaduli* is to some extent improved than that of *Ajogara*. The village is connected with Islampur *upazila* headquarters by *pucca* road from the office of the Union *Parishad*. Besides, other parts are connected with each other by earthen roads. People of this village can easily go to *upazila* headquarters by bicycle, rickshaw, rickshaw-van and auto-rickshaw. Still, it becomes difficult for the villagers to move during rainy season.

With regard to telecommunication, Bangladesh has improved enough in recent past. The telecom sector is recognized as the fastest growing sector in Bangladesh. At present, six mobile operators are operating telecom services in Bangladesh that also cover rural areas. Although *Ajogara* village is covered by mobile operators, most of the people are not able to avail this service because of their economic hardship. On the other hand, the villagers have learnt through informal discussion that more than fifty percent households of *Chinaduli* enjoy this service. The above discussion, therefore, reflects that in respect of transport and communication system *Chinaduli* is to some extent developed than *Ajogara*.

4.5 Physical Infrastructure and Flood Situation

Flooding is a common phenomenon in some low-lying parts of Bangladesh. It is a main cause of anxiety for most of the vulnerable households in rural Bangladesh (Begum, 1995). Therefore, necessary measures are required to combat flood. Two kinds of action were planned to combat floods. One was flood control – the design and construction of embankments or other structures to control water flow during the rainy season (Hanchett, Akhter and Akhter (1998). Accordingly, many embankments have already been built in Bangladesh to control flood (Begum, 1995). But *Ajogara* is an exception in this respect. There is no flood control dam and a sluice gate in this village. Therefore, this village is vulnerable to frequent flooding. Almost every year, the village is inundated by flash floods very quickly due to heavy rain and rush of upstreamwater. This type of flood usually remains for seven to 15 days during pre-monsoonperiod and damages the growing crops and physical infrastructures (house, road, etc.). But the normal flood usually stays

for two to three months in this locality. This village is affected by all kinds of floods except storm surge floods because of its geographical location.

On the other hand, there is an earthen road in the south of the *Chinaduli* village which is being used as flood control dam also. Distance of this dam is 500 meters from the bank of the river *Jamuna*. But it is apprehended that the road-cum-dam may be devoured by the *Jamuna* very soon. Generally, flood remains in the locality for two to three months and very often it is also affected by flash floods like in *Ajogara*. Flood creates different types of problems including river erosion (discussed in chapter seven). It damages lives and livelihoods of the people of the affected area. Unlike the people of the other parts of Bangladesh, who look ahead to normal flood, which is useful for agricultural production, the people of the study area are stricken with various kinds of flood in almost every year (Table 4.1). Occasionally, they are also affected by floods more than once in the same year (Table 4.2).

Table 4.1: Distribution of Responses to Occurrence of Flood in Every Year

Responses	Male		Female		Total	
	Number	Percent	Number	Percent	Number	Percent
Yes	190	93.14	203	99.51	393	96.32
No	14	6 .86	1	0.49	15	3.68
Total	**204**	**100**	**204**	**100**	**408**	**100**

Table 4.2: Responses to Occurrence ofFlood More than Once in the Same Year

Responses	Male		Female		Total	
	Number	Percent	Number	Percent	Number	Percent
Yes	196	96.08	202	99.02	398	97.55
No	8	3.92	2	0.98	10	2.45
Total	**204**	**100**	**204**	**100**	**408**	**100**

It should be mentioned that while the people of the other parts of Bangladesh cried for normal flood, the people of the study area struggled with severe flood in 2011, 2012 and 2013 too (The Daily *Jugantor*, 03.07.12: p.1. and The Bangladesh *Protidin*, 12.09.13, p. 12). It was observed during data collection that a vast area of cropping-field was

submerged, and damaged growing crop was remained there. Rahman, a 55-year-old farmer of *Chinaduli*, described the situation:

> *Our locality is affected by flood every year. This year also flood has destroyed our growing crops. Still there is waist-deep water in the field and we could not plant Amon paddy. But a few days ago I watched on television that the people of North-western part of Bangladesh could not cultivate their land due to lack of water.*

Jaynal, a 65-year-old farmer of *Ajogara*, gave a brief account of the flood situation of his locality in the following way. He said:

> *"Flood is regular phenomenon of our locality. Every year, even more than once in a single year, floods occur in this area. For example, our village was flooded in last week of June this year. Then the flood water was receded in July. But flood has occurred now again (in the month August)."*

4.6 Reasons for Recurrent Flood

The study villages as well as areas are severely vulnerable to recurrent floods. Ninety seven percent respondents mentioned that floods occur, even more than once, in every year in the study area. There are various reasons for occurrence of floods frequently. About one-third of the respondents (65.93 percent) said that increasing the water level of the river due to tide along with incessant rain was the main reason of frequent flood. On the other hand, a significant number of the respondents (47.30 percent) mentioned that nonexistence of flood control dam was the main cause of frequent flood in their area. If there were flood control dam, the flood would not have occurred frequently. On the other hand, about 44.00 percent respondents mentioned heavy rain as the main cause of frequent flood in their locality.

Table 4.3: Distribution of Reasons for Recurrent Floods in the Study Area by Sex

Reasons	**Male(n=204)**		**Female(n=204)**		**Total (n=408)**	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Tide along with rain	123	60.29	146	71.57	269	65.93
Lack of flood control dam	109	53.43	84	41.18	193	47.30
Heavy rain	93	45.59	86	42.16	179	43.87
Damage of earthen road	25	12.25	93	45.59	118	28.92

Non-repairing the road	52	25.49	0	0	52	12.75
*Others	6	2.94	6	2.94	12	2.94

*Low land, situated near the river etc.

Other causes of frequent floodscited by the respondents include damage of earthen road (28.92 percent), and non-repair of the dam (only male 25.49 percent). Likewise, the respondents, most of the key informants referred to the same reasons for recurrent floods.They also informed the researcher that water level of the *Jamuna* increases rapidly due to incessant rain in the upstream and opening of the *Farakka* Barrage during full monsoon. As a result, this region is flooded very quickly. Ahmad (1989) also identified the construction of *Farakka* Barrage as one of the causes of flood in Bangladesh.

4.7 Market-based Activities and Marketing Outlets

The notion of the market in economics is an abstract one, where exchange of commodities takes place. 'Rural *Haats*' are the oldest and significant platforms of economic, social and cultural exchange in rural Bangladesh. As vibrant economic exchange hubs, *Haats* play a vital role in the rural economy by allowing producers and farmers to procure essential inputs and raw materials and liquidate produce through retail or wholesale trading. However, markets have been domain of menin rural Bangladesh. Men control all shopping for household items and sell agricultural productsas well. In contrast, women may directly sell very minor items like eggs, poultry, vegetables etc. at their doorsteps to itinerant traders or through children to market (Sheheli, 2011).

However, traditional view in respect of market system, i.e., men's control over domain of market,was found in the study area. Male members of the family deal with the familial trading such as buying or selling of livestock, poultry, paddy, jute, other crops and valuable assets. Women do not participate in these market-based activities. However,the people of *Ajogara* village musthave to go to the mainland for trading essential goods as there is no market/bazaar at all. But there are some small marketing outletsat this village.Although women do not go to market for trading, they sell petty things such as rice, flour, lentils, onion, garlic, oil, salt and other daily essential goods at the small shop located at their home compound. The local women are the main buyers of these shops. Women operate these tiny business centers of essential goods at their home compound for earning additional income to overcome economic hardship.

Although mainstream tradition and culture of rural Bangladesh do not support women to operate such business, they do so with the prior permission of their male counterparts. Actually, male members of the family remain busy for the whole day with other jobs outside the home for earning income; that is why women operate their small businesses to ease the workload of men as well as to smooth the livelihood process. On the same ground, women of this village purchase essential goods such as rice, flour, oil, salt, onion etc. from these shops.

Unlike *Ajogara*, there is a small *bazaar* at *Chinaduli* village adjacent to the primary school. All of the shopkeepers at this *bazaar* are men. But some women were found to run their tiny shops at their home compound like *Ajogara*. Some women were also found to come to these shops for buying essential goods such as oil, rice, lentils, salt etc. But they (women) do not go to the market at *upazila* headquarters for big trading because of social restriction. Men also do not allow women to go to market to continue their control over resources and women's lives as well. That means men of this village, like in *Ajogara,* control market-based economic activities such as buying and selling of paddy/rice, wheat, mustard, jute, livestock, and poultry and so on. But there is an exception in case of *Eid* shopping. It is important to mention that according to key informants, some young women and adolescent girls of *Chinaduli*go to themarket at *upazila* headquarters for buying some desirable dress and cosmetics for celebrating *Eid* (the largest religious festival of Muslims).

4.8 Employment Opportunity

Employment situation is the most important indicator for economy of a country. To enhance the pace of gross domestic product (GDP) and social development, the government of Bangladesh has taken various initiatives for employment generation. But the labor force is growing faster than the employment potential (Bangladesh Bank, 2008).Currently the number of economically active population (above 15 years) in the country is 5.67 crore, out of which a labor force of 5.40 crore is engaged in a number of professions. However, agriculture still remains the highest source of employment that employs 47.33 percent of the workforce. It is observed that 44.40 percent (25.50 percent in agriculture and 18.90 percent in others) of labor force is engaged in self-employment. It is also found that 21.80 percent of labor force is day laborers and 19.70 percent unpaid family workers. Only 14.60 percent of the labor force is engaged in full-time employment

(Ministry of Finance [MoF], 2013). Almost a similar employment situation was found in the study area with some exceptions. Variationwas also found in nature of occupation of the people of *Ajogara* and *Chinaduli* (see detail in chapter five).

Although a significant number ofmen(51.00 percent) of *Ajogara* village work as weaver in handloomindustry situated in the mainland,many of them (about 19.00 percent)are engaged in agricultural activities. Only a few of them are engaged in formal sector (teacher, NGO worker).However, gender division of labor force is evident in this village. Traditionally women are engaged in household chores, vegetable gardening, watering the vegetable garden and preserving seeds. Usually, they do not participate in field level agricultural works like preparing field, planting seedlings, cutting paddy etc. although they participate in pre- and post-harvesting works. But the situation has changed in the recent past. At present, some of the women of *Ajogara*help their male counterparts in preparing seed-bed and watering the field.

Nevertheless, agro-based production system is exists in *Chinaduli* village. Unlike *Ajogara*, most of the men (about 72.00 percent) of this village are engaged in agricultural activities. On the other hand, women are involved in household chores. They also participate in reproductive works such as harvesting, preserving seeds, gardening vegetable, watering the vegetable garden, rearing poultry and livestock which is a traditional role of women in Bangladesh and the Indian Subcontinent in general. But currently a considerable number of poor women work as agricultural laborer like in *Ajogara,* but their wage is less than that of men. However, other occupations of the people of the study area are in the forms of agricultural laborer, daily laborer, construction laborer, rickshaw and rickshaw-van puller etc. The above-mentioned discussion indicates that most of the people of *Ajogara* are employed in non-farm activities and dependent on the area outside the village for employment. On the other hand, most of the people of *Chinaduli* are engaged in farm-activities. But the number of people of both villages employed in formal sector is negligible.

4.9 Situation of Basic Needs

Basic needs are defined as requirements for ‘the opportunity for a full life’ (Reader, 2006). Meeting basic needs is a matter of supplying persons or communities with appropriate bundles of commodities to enable them to lead a full life (Alkire, 2002; Sen,

1984) that includes food, cloth, shelter/housing, education, and health service. The overall basic needs situation of the study are is presented below.

4.9.1 Food Items and Food Habit

The deltaic flood plains of Bangladesh have been famous for producing various types of food items such as rice, wheat, lentils, vegetables, fruits etc. The climate and location of the country are also conducive to producing fish, meat, milk and eggs. But production of fish has decreased sharply due to siltation of rivers and *beel* (water body) and pollution of water and soil as well. However, food intake situation has been improved but the country is yet to achieve desired nutritional level. The diet is still highly imbalanced with rice and other cereals contributing nearly 80.00 percent of total energy, and fruits and vegetables contributing only 3.00 percent, consequently the diet is deficient in vitamins and minerals (Halder and Urey, 2003).

Rice is the staple food of Bangladesh. Bangladeshis eat rice everyday and almost at every meal. Sometimes they use wheat as staple food due to less production of rice and because of food shortage during floods. They try to keep fish, meat, different types of pulses, vegetables etc. in their menu list. But nowadays the people of *Ajogara* hardly buy fish and meat due to price hike and economic hardship. It is observed during field work that many children of this village are suffering from malnutrition. On the contrary, it is observed that some of the households of *Chinaduli* are economically better-off than others. Theyare found to be capable to consume fish, meat and other expensive food items, although it is beyond the capacity of poor families of this village. That is why many children of the poor family suffer from malnutrition and ill health of this village like in *Ajogara*. The people of the study area usually have their meal three times in a day. But some of themare compelled to reduce their food consumption during a flood and after flood due to food crisis as well as economic hardship (see chapter seven for details).

However, gender ideology affects the household food allocation system in many societies (Chen et al. 1981 cited in Begum, 1995). Men's control over land and other resources is central to intra-household food allocation and consumption in a patriarchal society. Although women are responsible for procuring, preparing and distributing food they eat less. Generally, they provide larger portion of food for male as the men are the authority of the household (Begum, 1995:54). Traditionally,women take their meal after men in

rural Bangladesh,but the situation has changed in recent past. Both men and women have their meals at a time. Rather, sometimes it happens opposite at *Ajogara.* The researcher has been informed through informal discussion with the villagers that if men are late in returning home from mainland due to urgent business or hostile weather then female members of the family eat their meal with children before returning of their male counterparts. Men of this area do not take it as the violation of traditional practice. Rather they think that it is the doctrine of necessity that indicates the shifting of gender discrimination, which may be considered as a positive outcome of education and awareness building activities of GAs and NGOs.

4.9.2 Clothing

Clothing is a basic need of civilized person. It also protects humans from many things that include environmental hazards and attack of animals. In most cultures, gender differentiation of clothing is considered appropriate for men and women. The differences are in style, colors and fabrics. However, Bangladeshi men in rural areas, wear the *lungi* and a shirt or *kurta*. The better educated men wear *punjabi* and *paijama*. On the other hand, women typically wear a *sari* and *blouse*, although, girls and young women prefer the *salwar-kamiz*.The clothing style is not different in the study area from the mainstream practice of Bangladesh. It is observed during field work that many people of both the villages could not bear the expenses for adequate clothing due to poverty. Many of them wear old, torn and worn-out clothing. In addition, sometimes flood washes away the clothing along with other valuable goods. Consequently, the poor people are to suffer from required clothes and depend on assistance of GAs and NGOs.However, minor boys and girls wander aroundwithout clothes on upper portion of the body. The adolescent boys very often also do not wear clothes on upper portion of the body,but the girls of the same age-group must wear*salwar-kamiz*.

4.9.3 Housing

Housing is one of the basic needs of human beings. Among thebasicneeds it ranks high after food, water and health. A housing environment can be an index of the social health, happiness, social justice and dignity of the inhabitants (Gaillard, 1995 cited in Vries, 2002; Hasan; Ullah and Gomes, 2000). But present housing facilities are inadequate in Bangladesh. A large portion (85 percent) of dwelling structures is in someway temporary in nature and in unsatisfactory conditions in terms of structural quality (Sheheli, 2001).

However, most of the dwelling houses of Bangladesh are located in rural area as about 76 percent people live in rural settlements. Comparatively high lands are preferred for building a house in rural areas as it is predominantly a flood plain. Where high lands are not available, especially in *haor* and *beel* areas, houses are built on artificially raised grounds. Housing process encompasses a number of factors such as income, status, and size of the household that has been also found in the study area. Most of the houses in the study area are constituted of one or more rooms depending upon the socioeconomic condition of the owner. Some of the households have inner and outer courtyards for farmhouse operations. Some of them have no demarcation of inner and outer courtyards. But most of the households of *Ajogara* are found without separate kitchens. In dry season, they usually cook in the courtyard and the space is hardly roofed. But in rainy season, they use the narrowverandah as kitchen. In contrast, most of the households of *Chinaduli* have separate kitchens as their socioeconomic condition is improved than that of *Ajogara.* They have cowshed, poultry pen, and fuel shed too. But these are usually built of inferior and temporary materials. These need replacement within one to five years as these are poorly constructed.

However, the houses are surrounded by perennial trees giving protection from sun and storms. It also provides some degree of privacy. Most of the houses have boundary fences/walls for inner courtyard to ensure privacy of the inmates, which is normally made of jute-stalk, bamboo, palm leaves, straw or corrugated iron (CI) sheets depending on the social and economic status of the house-owner. Likewise, the boundary walls, nature and quality of the dwelling houses depend upon the social and economic condition of the owner. Almost all of the houses of *Ajogara* and most of the houses of *Chinaduli* are made of indigenous materials, available in the respective areas such as bamboo, jute-stalk, straw, palm leaves, CI sheets, mud, and bricks.

However, the houses of better-off families are made of corrugated iron (CI) sheet and brick. Houses of middle class are made of CI sheet with bamboo and wood. On the other hand, houses of poor families are made of straw, hay, bamboo and other materials. The walls of these houses are made of bamboo, leaves, mud, and jute-stalk. It should be noted that there are some houses made of CI sheet and brick at *Chinaduli*. But the housing condition of *Ajogara* is poor compared to that of *Chinaduli*. Actually, because of

povertythe inhabitants of *Ajogara* could not build the walls of their houses using brick. Again, the well-off families do not build their houses with brick due to fear of collapse of the house into the *Jamuna* any time because of erosion. But it is a matter of deep regret that many people of both the villages have no house at all. They live in make-shift house made of straw, leaves, mud and polythene at the road-side space. But the overall housing condition of *Chinaduli* is improved than that of *Ajogara*.

4.9.4 Educational Facilities and Literacy Rate

Education is the most important tool to enhance human resource development. It directly contributes to building an enlightened and progressive society as it improves the knowledge and skill of a person. Educated persons are considered as the driving force of the development of a country. Therefore, the Government of Bangladesh is giving high priority to the education sector. The government is committed to ensuring 100 percent enrollment of children at primary school by 2011 (but not possible to achieveyet) and eradicating illiteracy by 2014. Accordingly, several programs have been adopted by the governmentto implement these commitments that include widening the coverage of stipend, school feeding program, establishing schools in the villages without school (MoF, 2013). But the children of many remote areas are still deprived of adequate educational facilities. *Ajogara*, one of the study villages of the present research, is such a village where educational facilities are very negligible. There is only oneprimary school named *Ananda*Schoolfinanced by the World Bank. But the accommodation facilities of this school are not available. Therefore, many school-aged children are being deprived of the right to education. Moreover, they have to go to school situated at the mainland for secondary education by walking about 3-5 kms distance and crossing a canal. It is very troublesome for the minor boys and girls that createabsenteeism and unwillingness among them to attend school.

Furthermore, some guardians engage their children in income earning activities due to economic hardship. Consequently, literacy rate of this village is very poor (27.6 percent) compared to national level, i.e. 56.09 percent(BBS, 2012). It should be noted that although the children of this village could go to the school taking some troubles in dry season, it becomes more difficult during flood. They cannot attend school by crossing the river as it appears dreadful in rainy season due to storm and high waves. Besides, the

students suffer from insufficient light for studying as the village is not provided with supply of electricity. In contrast, more educational facilities are available in *Chinaduli*. There is a primary and a high school in this village. There is also a *madrasa* for religious education for Muslim children. Apart from this, the children can easily go to the *upazila* headquarters for primary, secondary and higher secondary education since the road communication of *Chinaduli* is to some extent improved compared to *Ajogara*. Therefore, literacy rate of this village (30.40 percent) is slightly higher than that of Ajogara (27.60 percent).

4.9.5 Health Situation

Over the recent decades, Bangladesh has made substantial advancement in health sector. Health status of the people has improved. Life expectancy at birth has increased, and maternal, infant and child mortality rates have declined (Planning Commission, 2010). In spite of these improvements, some health problems persist in Bangladesh. For example, malnutrition, anemia, diarrhea, dysentery etc. exist in Bangladesh. However, doctor-population ratio is very high, i.e., 1:2785 (MoF, 2013). It is certainly inadequate for the health care needs of the people. The prevalence of medical facilities is highly poor in rural areas. For example, extreme scarcity of medicine, health center and pathological diagnostic centers as well as trained nurses and health assistants exists in rural Bangladesh. Furthermore, they are deprived of the service of skilled birth attendants during delivery. More than 80 percent of deliveries take place at home. Traditional birth attendants assist three-quarters of birth in Bangladesh. Only 18 percent receive post-natal care (ibid). The situation of the study villagesis no exception to this. The situation is even worse in *Ajogara* as it is located in *char* area far from *upazila* headquarters and the transport system is not conducive to reaching health centers easily.

With regard to health care pattern, like in other developing countries, the existence of several distinct therapeutic systems is an important feature of health care system of Bangladesh (Hossen & Westhues, 2011 cited in Kalin, 2011). A wide range of therapeutic choices is available in Bangladesh from self-care to folk and western medicine; both allopathic and homeopathic (see detail in chapter seven). However, the Ministry of Health and Family Welfare (MoHFW) is primarily responsible for providing preventive and curative care for all citizens. There has been massive investment in rural health infrastructure and various programs (along-side urban areas) for providing primary heath

care at *upazila* (sub-district), union (lowest tier of local government) and village levelas well. But there is no health center in *Ajogara* although a mobile team provides medical service that is not adequate. On the other hand, there is a UnionFamilyWelfareCenter in *Chinaduli*.

However, a large number of NGOs are involved in health care provision in Bangladesh. These NGOs have both separate health care services and partnership programs with the government that plays important role to augment access to and improve the quality of care, especially in under-served areas (Ahmed, 2007 cited in Kalin, 2011). Apart from health services provided by the government and NGOs, private health care providers play a significant role in Bangladeshi health care system. Around 85 percent people in Bangladesh receive service from this sector. This sector consists of informal village doctors, drugstore salesmen, traditional healers and homeopathic practitioners. Most of the people of the study area also receive service from this sector. But the situation of *Ajogara* is worse than that of *Chinaduli* in respect of receiving service from this sector as there is no drugstore, local medical assistant or homeopathic dispensary in *Ajogara*. (But they can buy oral saline (ORS), paracetamol, metronidazol etc. from small shops in this village).

4.10 Social Situation: Practice of *Purdah* and Women's Status

To maintain *purdah* is one of the sacred duties for Muslim women in Bangladesh. Eminent researchers (Begum, 1988; Jahan, 1975) have pointed out that almost all women, both in rural and urban areas, practice *purdah* although the form or degree varies from one category to another. The word *purdah* literally means curtain or veil, but its social connotation is far greater than simply an attire that covers the body. It is related to the socio-cultural structure of society that restricts women's mobility. They are not allowed to be seen by unknown men. Of course, they should keep their modesty and their voice should not be reached males' ears outside the household (Frankl, 2004; Islam 1979 cited in Kabeer, 2000; Rozario, 1992).

The practice of*purdah* is at heart of gendered division of roles in Bangladesh. This phenomenon assigns different roles, rights and responsibilities to male and female and structures relationship between them which allocates indoor work for women and outdoor work for men (Chen et al. 1986 cited in Begum, 1995). But the practice of *purdah* in the

study area varies on the basis of age and the stages of life of women and socioeconomic status of the household like in other areas of Bangladesh. For instance, minor girls freely move from here to there and usually do not use veil. In contrast, *purdah*is strictly followed after puberty and during reproductive stage. Again, it is relaxed for older;widows and husband deserted women. Like with the minor girls, older women, widows, and husband-deserted women, the practice of *purdah* is more flexible among poor women. They work outside of their home as daily laborers (mentioned earlier), participate in income earning activities and so on.

The key informants and other villagers of the study area informed the researcher that widows, husband-deserted and poor women are compelled to work outside their homes for maintaining their livelihoods. The urge of fulfilling basic needs is one of the most important factors which lead women to work outside home. The poor families cannot afford to apply *purdah* restriction over their women. They need economic support from women for the survival of their households. Basically, to continue livelihood is more important than maintaining*purdah.*In contrast, women of affluent family do not work outside their home; even they do not go outside without the company of male members of their family. It should be mentioned that some of the women of rich family even did not want to meet the researcherat initial stage due to *purdah* system. After introducing himself as a researcher and teacher of a university and clarifying the objectives and importance of the study, they agreed to talk to the Researcher.

AlthoughBangladeshi women are traditionally confined to homewith little social contact outside their own kin groups because of *purdah* norms, the compulsion of *purdah* practice has started to change in present rural Bangladesh these days (Hossain, 2008; Karim, 2005; Sultana, Jawan & Hashim, 2009) that is also seen in the study area. The womenunder the study area very often go to the health centre and some of them are involved in microcredit program, and work outside home, and operate small business. It is also observed at the time of data collection that many of them move from here to there without veil (*borka*). Even some of them do not cover their head and forehead with the end of *sari*. Many women of *Chinaduli* village go to the market for *Eid* shopping. Some of them work as laborer of earth slicing and filling, work in vegetable gardens and defend their work and counter-argue with men (observed in FGD sessions). Unlike the women of

Chinaduli, the women of *Ajogara* do not go to the marketplace. But some of them work at home and outside their home for livelihoods that is mentioned earlier. Basically, social norms and traditions are being changed and women are appearing in the farm and non-farm activities in the study area to combat extreme poverty and toimprove their socioeconomic condition.

4.11 Involvement of Women in Income Earning Activities

It is mentioned earlier that traditionally women of rural Bangladesh are engaged in daily household chores. At present,they are alsofound to be actively involved in various agricultural activities (Karim, 2005). They are, in general, responsible for most agricultural works in the homestead. Agricultural activities in homesteadrange from selection of seeds to harvesting and post-harvesting ones such as storing crops and preserving seeds. They are also involved in crop cultivation, homestead gardening, livestock and poultry rearing, fishing, cottage industry and so on. Nowadays, women's involvement in field level agricultural activities is very much visible. The women of both the villages are involved in uprooting seedling, planting seedlings, cutting paddy etc. Apart from this, many of them in*Ajogara* prepare cotton thread on spinning wheel as means of livelihood, but their wages are too small.

4.12 Conclusion

The study villages are located on thebank of the river *Jamuna*. Geographical location makes the study villages vulnerable to floods and river erosion. People of these villages are, therefore, affected by floods almost every year and even more than once in a single year that affects their livelihoods. They maintain the age-old patriarchal norms, values and traditions. But occupational status and *purdah*practice of the study area have alsochanged in the recent past like in other parts of the country. Therefore, the study tries to examine,in the next chapters, whether there is any relationship between effect of flood and the above-mentioned social change in the lives of people in the two villages under the present study.

Chapter V
Socioeconomic Characteristics of the Respondents

5.1 Introduction

The chapter five,deals with the demographic characteristics and socioeconomic condition of the respondents. It presents theage structure, educational level, occupation as well as personal and household income of the respondents. It also categorizes the household status of the respondents according to their monthly income and landownership. In addition, the chapter highlights the savings of the respondents, and ownership of land and access to and control over resources of women. All of these issues are related to the social structure and status of the respondents. However, analysis of the above-mentioned issues is based on primary data collected from the respondentsthrough face to face interview, FGD and observation.

5.2 Age Structure

The age distribution of the respondents reveals that both male and female respondents were from different age groups. The age of the male respondentsranged from 22 to 80 years. The average age of the male respondents was found to be 41.58 years with standard deviation (SD) of12.79. On the other hand, the age distribution of the female respondents ranged from 21 to 65 years with a mean and standard deviation of 37.86 years and 9.68 respectively. Table 5.1 further shows that half of the male respondents were within the age of 21-40 years, while a little bit more than two-third (66.18 percent) women were found in the same age group.

However, Table 5.1 illustrates that the highest number of the male respondents (15.69 percent) were found within the age of 26-30 years followed by the age groups of 41-45 years (15.20 percent) and 46-50 years (14.22 percent) respectively. On the other hand, majority of the female respondents (23.53 percent) werefound within the age of 36-40 years followed by the age groups of 31-35 years (16.67 percent) and 46-50 years (14.22 percent) respectively. It should be noted that out of the total respondents, 8.33 percent men and 1.47 percent women were found to be more than 60 years.

Table-5.1: Distribution of Age of the Respondents by Sex

Age (in years)	Male		Female		Total	
	Number	Percent	Number	Percent	Number	Percent
21-25	19	9.31	28	13.73	47	11.52
26-30	32	15.69	25	12.25	57	13.97
31-35	23	11.27	34	16.67	57	13.97
36-40	28	13.72	48	23.53	76	18.63
41-45	31	15.20	25	12.25	56	13.73
46-50	29	14.22	29	14.22	58	14.22
51-55	14	6.86	8	3.92	22	5.39
56-60	11	5.39	4	1.96	15	3.68
61-65	11	5.39	3	1.47	14	3.43
66+	6	2.94	-	-	6	1.47
Total	**204**	**100**	**204**	**100**	**408**	**100**

Mean for male= 41.58, Standard deviation= 12.79

Mean for female = 37.86, Standard deviation= 9.68

However, people are considered as young in Bangladesh who are in the age-range of 15-35 years (Department of Youth Development [DYD], 2009). On the other hand, after fifty people gradually lose their productivity. Considering this categorization and based on the observed age score, the respondents were classified into three broad categories namely ‘young’ (up to 35 years), ‘middle-aged’ (36-50 years) and ‘old’ (above 50 years). However, a significant number of the respondents (46.57 percent) were found middle-aged. On the other hand, more than one-third (39.46 percent) of them were from ‘young’ category and the remaining (about 14 percent) were from ‘aged’ category (Figure 5.1).

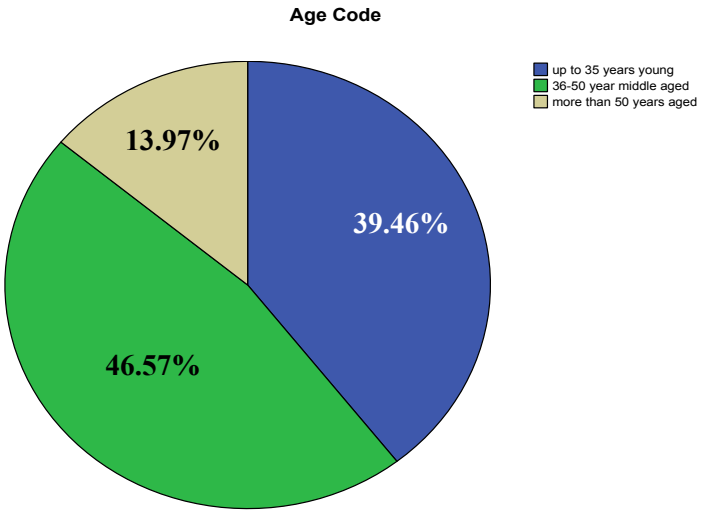

Figure 5.1: Categories of the Respondents by Age

However, variation was found between men and women based on age. The data generated from the survey show that 36.27 percent male belonged to young, 43.14 percent were found to be middle-aged and the rest 20.59 percent belonged to old category. On the other hand, 42.65 percent female belonged to young, 50.00 percent were found to be middle-aged and the rest 7.35 percent were found to be old. It is observed that female respondents were comparatively younger than male.

Table-5.2: Categorization of the Respondents on the Basis of Age by Sex

Categories	Male		Female		Total	
	Number	Percent	Number	Percent	Number	Percent
Young	74	36.27	87	42.65	161	39.46
Middle-aged	88	43.14	102	50.00	190	46.57
Old	42	20.59	15	7.35	57	13.97
Total	**204**	**100**	**204**	**100**	**408**	**100**

5.3 Educational Qualification

According to the Constitution of the People's Republic of Bangladesh, the government has an obligation to ensure education for all of the citizens of the country. Accordingly, the government is committed to ensuring education for all by 2015. Various measures

have also been taken to attain the goal (MoF, 2013). But the fact is that present literacy[1] rate (7+ years) in Bangladesh is 56.09 (male 58.76 and female 53.44) percent (BBS, 2012). On the other hand, it is significant to mention that the situation of the study area, in respect of literacy rate, is worse than that of national level. Data show that 42.17 percent male respondents of the study area were found to be illiterate and 23.53 percentof them only could right their name, that is, about two-thirds (65.70 percent) of the male respondents had no formal education[2]. Conversely, only 34.30 percent of the male respondents had some formal education of which 9.31 percent completed only grade 1-5, for whom it was difficult to write and understand a letter either in Bangla or in English. Therefore, the largest number of the male respondents (75.01 percent) was virtually found to be illiterate. However, some of them (9.31 percent) completed grade 6-10. A few of them i.e. about 7.00 percent and 5.39 percent were found to be graduated up to the Secondary School Certificate (SSC) and Higher Secondary Certificate (HSC). And, only 2.43 percent were found to have completed Bachelor's degree.

However, out of the total female respondents, 38.24 percent were foundto be illiterate and 39.71 percent only could write their names, that is,more than three-quarters (77.95 percent)of the women did not have any formal education. Only 22.05 percent women were found to have more or less formal education. Among them about 9.00 percent women completed only grade 1-5, who were found to be unable to write and understand a letter properly that indicates the lower position of women of the study area in terms of literacy rate in comparison with national level (53.44 percent). However, about 8.00 percent of the female respondents were found to have completed grade 6-10. A few of them (2.45 percent) were found to have completed SSC and HSC (about 2.00 percent) graduation. Only two of them (about 1.00 percent) were found to have obtained Bachelor's (pass) degree, which indicates that men were more likely to have higher education than women.

Table 5.3: Educational Qualification of the Respondents by Sex

Educational	Male	Female	Total

[1]It denotes the ability of a person to write a letter in any language (BBS, 2012).

[2]Formal education corresponds to a systematic and organized education model that is characterized by a continuous education process, which necessarily involves the teacher, the student and the institution. It corresponds to the education process normally adopted by our schools and universities that requires from students a minimum class room attendance. It involves with intermediate and final assessments in order to advance students to the next leaning stage and it also confers degrees and diplomas (Dib, 1988).

Qualification	Number	Percent	Number	Percent	Number	Percent
Illiterate	86	42.17	78	38.24	164	40.20
Only can write name	48	23.53	81	39.71	129	31.62
Class I-V	19	9.31	18	8.82	37	9.07
Class VI-X	19	9.31	16	7.84	35	8.58
SSC	14	6.86	5	2.45	19	4.66
HSC	11	5.39	4	1.96	15	3.68
Bachelor (Pass)	3	1.47	2	0.98	5	1.23
Bachelor (Honors)	4	1.96	-	-	4	0.98
Total	**204**	**100**	**204**	**100**	**408**	**100**

However, reasons for less literacy of women are existed in the social context of Bangladesh. In rural area, girls usually participate in the household work from their childhood, and parents are more eager to send boys to school for education. A general belief among rural people is that girls will get married one day, and move out to stay at their husbands' house. But boys will stay with parents and take care of them. That is why; educating boys is supposed to be more worthwhile than educating girls and large numbers of rural women are deprived of education and possess a low educational status. Consequently the Government of Bangladesh has taken some important measures in recent years to promote girls education that include establishment of new schools in remote areas, free distribution of books, stipends for girls, education fee waivers and food for education programs. These initiatives have improved the present scenario of enrolment of girls in primary and secondary schools in the recent years and may promote higher education of women in future too (MoF, 2013).

5.4 Occupation

Agriculture is the main occupation of the rural people in Bangladesh. It was noexception to the case of*Chinaduli,*where a significant portion of the malerespondents (45.10 percent) were found to be involved in agricultural activities. But the situation of *Ajogara* was different with regard to occupation, where most of the male respondents (50.98 percent) were found to be handloom worker. Apart from agriculture, other occupations belonging to men were agriculture laborer (18.14 percent), daily laborer (6.37 percent),

construction worker (5.88 percent), rickshaw puller (7.84 percent), and small business (5.88 percent). Only a very few of them were found to be engaged in teaching and NGO sector (Table 5.4).

Table 5.4: Occupation of the Male Respondents

Occupations	Ajogara	Chinaduli	Total
Agriculture	10 (9.80)	46 (45.10)	56 (27.46)
Agricultural laborer	10 (9.80)	27 (26.47)	27 (18.14)
Daily laborer	7 (6.86)	6 (5.88)	13 (6.37)
Construction laborer	3 (2.94)	9 (8.82)	12 (5.88)
Handloom laborer	52 (50.98)	1 (0.98)	53 (25.98)
NGO worker	1 (0.98)	-	1 (0.49)
Rickshaw/van pulling	12 (11.77)	4 (3.92)	16 (7.84)
Small Business	6 (5.88)	6 (5.88)	12 (5.88)
Teacher	1 (0.98)	3 (2.94)	4 (1.96)
Total	**102 (100)**	**102 (100)**	**204 (100)**

Percentages have been shown in parenthesis.

Table 5.5: Occupation of the Female Respondents

Occupations	Ajogara	Chinaduli	Total
Housewife	90 (88.24)	99 (97.06)	189 (92.65)
Agricultural laborer	3 (2.94)	-	3 (1.47)
Handloom laborer	2 (1.96)	-	2 (0.98)
NGO worker	1 (0.98)	1 (0.98)	2 (0.98)
Earth cutting	6 (5.88)	1 (0.98)	7 (3.43)
Teaching	-	1 (0.98)	1 (0.49)
Total	**102 (100)**	**102 (100)**	**204 (100)**

With regard to occupation of women, most of them (92.65 percent) were found as housewives. About one percent of the women were found to be working as field level NGO workers. A few of the women of *Ajogara* were found as agricultural (about 3.00

percent) and handloom (about 2.00 percent) laborers, while none of the women in *Chinaduli* were found to be engaged in such works. In addition, about 6.00 percent women of *Ajogara* were found to be engaged in earth cutting, whereas only about 1.00 percent women in *Chinaduli* were found in this sector. Again, about 1.00 percent women of *Chinaduli* were found to be engaged in teaching, while none of the women in *Ajogara* were found in this profession (Table 5.5). However, the women, whose main occupation was not that of housewife,stated that they did these jobs along with doing other daily household works that created double burden for them.

5.5 Household Size, Landownership and Income

Household, in general, refers to a group of persons, related or unrelated, living together and taking food from the same kitchen (BBS, 2012). Broadly it is defined on the basis of some issues that include: a common cooking place (*chula* or heath group), common meals (*khana* or eating unit), common living quarters (*ghor* or separate room/house) and a common homestead (courtyard) (Herbor, 1994 cited in Begum, 1995). Households include not only kin but also single persons living alone, couples, distant relatives, permanent laborers (servant), divorced and widowed daughters and other groups of people (Begum, 1995). The economy of the household is influenced by household size, income and resources. Household resources may include human as well as financial resources.

5.5.1 Household Size

Household size in the study area was ranged from 2 to 13 members with an average of 5.21 (SD=1.83), while national average household size in Bangladesh is 4.4 (BBS, 2012). The average family size of the study area was, therefore, relatively large compared to the national level. However, difference was found between the average household sizes of the two villages. Data show that average household size of *Ajogara* was 5.35 with SD 1.78, whereas average household size of *Chinaduli* was 5.05 with SD 1.88 that indicates slightly largeraverage household size of *Ajogara* than that of *Chinaduli* (Table 5.6).

Table 5.6: Distribution of Household Size by Village

Household Size	Ajogara		Chinaduli		Total	
	Number	Percent	Number	Percent	Number	Percent
2	4	1.96	15	7.35	19	4.66

3	33	16.18	20	9.80	53	12.99
4	24	11.76	44	21.57	68	16.67
5	53	25.98	50	24.51	103	25.25
6	47	23.04	44	21.57	91	22.30
7	19	9.31	21	10.29	40	9.80
8	13	6.37	1	0.49	14	3.43
9	8	3.92	1	0.49	9	2.21
10	2	0.98	4	1.96	6	1.47
11+	1	0.49	4	1.96	5	1.23
Total	**204**	**100**	**204**	**100**	**408**	**100**

However, a significant number of the households (25.25 percent) in the study area were found with five members (25.25) followed by six members (22.30 percent). Some households were found quite small with only two members (4.66 percent). In contrast, some households were found fairly large in size with more than ten members (1.23 percent). However, based on the number of members, the households were divided into three broad categories, namely 'small household' (up to 4 members), 'medium household' (5-6 members) and 'large household' (7+ members). Data show that the highest portion of the households (47.79 percent) belonged to medium household category, about one-third (34.07 percent) households were found in 'small category' and the remaining 18.14 percent households were found in 'large category' (Figure 5.2).

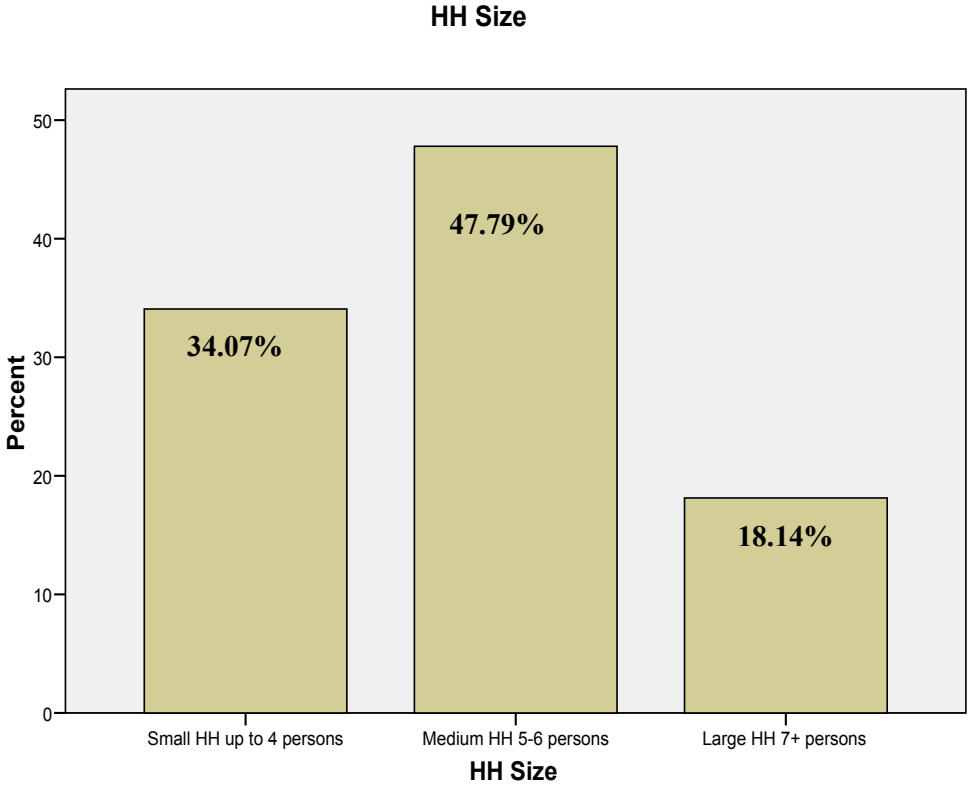

Figure 5.2: Household Size of the Respondents

Table 5.7 shows the difference between the number of households of different categories of *Ajogara* and *Chinaduli*. The number of medium (49.02 percent) and large households (21.08 percent) was found higher in *Ajogara* than that of *Chinaduli* (46.57 and 15.19 percent). On the other hand, small households were found higher in *Chinaduli* (38.24 percent) than that of *Ajogara* (29.90 percent).

Table 5.7: Distribution of HouseholdCategory by Study Villages

Categories	**Ajogara**		**Chinaduli**		**Total**	
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Small household	61	29.90	78	38.24	139	34.07
Medium household	100	49.02	95	46.57	195	47.79
Large household	43	21.08	31	15.19	74	18.14
Total	**204**	**100**	**204**	**100**	**208**	**100**

5.5.2 Household Landownership Pattern

Land ownership is the key elements of socioeconomic status in rural Bangladesh. It is the basis of a household's power in society as well as main source of security (Begum, 1995). But it is a matter of regret that more than one-third households (34.31 percent) of *Ajogara* and near-about half (46.57 percent)of the households of *Chinaduli*were found absolutely landless.They had no land at all to build a house for living. They resided at *khasland* (belonging to the government) or land of relatives or neighbors who were called *utulla*(refugee) at *Ajogara* village. In contrast, a few of the households (1.23 percent) were found to have ownership of more than four acres of land (Table 5.8). However, of the people who lost their land to river erosion, some became owner of small pieces of land after emergence of *char* in *Ajogara*. On the other hand, due to voracious erosion of the river *Jamuna,* some of the respondents of *Chinaduli* very recently have lost their lands including homestead that made them landless and more vulnerable.

However, one-fifths of household (19.12 percent of whom 30.39 percent in *Ajogara*, compared to 7.84 percent in *Chinaduli*) were found to be having ownership of only 0.01-0.05 acre of land. In this area they could only make a house with one or two rooms. In addition, some of the households were found to have 0.06-0.10 acre (9.31 percent), 0.11-0.25 acre (6.37 percent), and 0.26-0.50 acre (4.90 percent) of land. In addition, 3.43 percent and 4.90 percent households were found to have 0.51-0.75 acre and 0.76-1.00 acre of land respectively. On the other hand, some of the households were found to be having 1.01-1.50 acre (3.67 percent), 1.51-2.00 acres (1.47 percent), 2.01-2.50 acres (1.71 percent) and 2.51-3.00 acres (0.25 percent) of land. It should be noted that 2.70 percent households were found to have 3.01-3.50 acres of land and the remaining 0.49 percent households had ownership of 3.51-4.00 acres of land (Table 5.8).

Table 5.8: Distribution of Quantity of Household Landownership

Quantity of Land (in Acre)	Ajogara		Chinaduli		Total	
	Number	Percent	Number	Percent	Number	Percent
No land	70	34.31	95	46.57	165	40.44
0.01-0.05	62	30.39	16	7.84	78	19.12
0.06-0.10	26	12.75	12	5.88	38	9.31

0.11-0.25	18	8.82	8	3.92	26	6.37
0.26-0.50	6	2.94	14	6.86	20	4.90
0.51-0.75	2	0.98	12	5.88	14	3.43
0.76-1.00	4	1.96	16	7.84	20	4.90
1.01-1.50	5	2.45	10	4.90	15	3.67
1.51-2.00	5	2.45	1	0.49	6	1.47
2.01-2.50	1	0.49	6	2.94	7	1.71
2.51-3.00	0	0	1	0.49	1	0.25
3.01-3.50	1	0.49	10	4.90	11	2.70
3.51-4.00	1	0.49	1	049	2	0.49
4.00+	3	1.47	2	2	5	1.23
Total	**204**	**100**	**204**	**100**	**408**	**100**

However, on the basis of landownership, the households have been divided into four broad categories, namely 'destitute' (no land at all), 'landless' (up to .50 acre of land), 'marginal farm' (.51-2.00 acres of land) and 'small farm' (above 2.00 acres of land) households. Actually, up to 0.50 acre of land is not enough to fulfill minimum household demands of a family and they have to largely depend on non-farm activities for their livelihoods. That is why this category of householdshas been considered as landless.On the other hand, the households who own .51-2.00 acres of land have been considered as small farm household as they have to combine cultivation with other non-farm activities for their livelihoods (Karim, 2011). In addition, the households who own more than 2.00 acres of land have been considered as small-farm households (comparatively better-off family), whose livelihoods mostly depend on arable farm activities in rural Bangladesh**.**

Table 5.9: HouseholdCategoryon the basis of Landownership by Village

Categories	**Ajogara**		**Chinaduli**		**Total**	
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Destitute	70	34.31	95	46.57	165	40.44
Landless	112	54.90	50	24.51	162	39.71
Marginal Farm	16	7.84	39	19.12	55	13.48

Small Farm	6	2.94	20	9.80	26	6.37
Total	**204**	**100**	**204**	**100**	**408**	**100**

Pearson Chi-Square: 44.67, df 3, sig. value .000.

However, a significant difference was found between the categories of households in *Ajogara* and *Chinaduli* in respect of landownership, χ^2 (3, N = 408) = 44.67, p< .001. The number of destitute households was found higher in *Chinaduli* (46.57 percent) than that of *Ajogara* (34.31 percent). The reason behind higher number of destitute in *Chinaduli* was river erosion. It was observed during data collection that some of the households of this village very recently became destitute because of losing their land including homestead to river erosion. Some of them were leaving the village. Nonetheless, the number of landless households was found higher in *Ajogara* (54.90 percent) than that of *Chinaduli* (24.51 percent). Some of the people of this village became owner of a piece of land after rising of *char* in the *Jamuna*. On other hand, the number of marginal and small farm households was found higher in *Chinaduli* (19.12 percent and about 10 percent) than that of *Ajogara* (about 8.00 percent and 3.00 percent).

5.5.3 Monthly Household Income

Monthly household income of the study area was ranged from BDT 1500.00/- to 35,000.00/- with a mean and standard deviation of BDT 4564.21 and 3679.71 respectively. Average monthly household income of *Ajogara* was found BDT 4270.59/- (SD=3936.89) with a minimum and maximum income of BDT 1700.00/- and 35,000.00/- respectively.Conversely, average monthly household income of *Chinaduli* was found to be BDT 4857.84/- (SD=3387.44) with a minimum and maximum income of BDT 1500.00/- and 30,000.00/- respectively. Although both minimum and maximum monthly household income of *Ajogara* was found higher than that of *Chinaduli,*average income was found higher in *Chinaduli* with less variation than that of *Ajogara*. However, monthly income of a significant number of households (30.15 percent) was found within BDT 2001.00/- to 3000.00/- followed by about one-quarter of the households with a monthly income of BDT 3001.00/- to 4000.00/-. In addition, about twelve percent households had monthly income only up to BDT 2000.00/- (Table 5.10).

Table 5.10: Distribution of Monthly Household Income

Monthly income (in BDT)	Ajogara		Chinaduli		Total	
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Up to 2000	21	10.29	28	13.73	49	12.01
2001-3000	73	35.78	50	24.51	123	30.15
3001-4000	55	26.96	43	21.08	98	24.02
4001-5000	25	12.35	30	14.71	55	13.48
5001-6000	8	3.92	14	6.86	22	5.92
6001-7000	6	2.94	8	3.92	14	3.43
7001-8000	3	1.47	12	5.88	15	3.68
8001-9000	5	2.45	4	1.96	9	2.21
9001-10000	3	1.47	4	1.96	7	1.72
11001-12000	0	0	8	3.92	8	1.96
Above 12000	5	2.45	3	1.47	8	1.96
Total	**204**	**100**	**204**	**100**	**408**	**100**

It is significant to note that monthly income of one-third households was found less than BDT 4166.67/- which might be regarded as poorest class as per rules of Implementation Manual of Rural Social Service (RSS) Program (Department of Social Services [DSS], 2010:5). In contrast, some of the households (1.96 percent) were found to have monthly income of more than BDT 12000.00/-. Even a few of the household had monthly income of BDT 30,000.00/- and 35,000/- who lived over poverty line. On the other hand, some of the households (13.48 percent) had monthly income of BDT 4001.00/- to 5000.00/- who are considered as poor (ibid). However, some of households had monthly income of BDT 5001.00/- to 6000.00/- (5.92 percent), BDT 6001.00/- to 7000.00/- (3.43 percent), BDT 7001.00/- to 8000.00/- (3.68 percent), BDT 8001.00/- to 9000.00/- (2.21 percent), and BDT 9001.00/- to 10000.00/- (1.72 percent) that indicate income variation of the respondents irrespective of study villages.

However, based on monthly household income, the household of respondents have been classified into three categories namely 'low income' (up toBDT 4000.00/-), 'medium income' (BDT 4001.00/- to 6000.00/-) and 'high income' (above BDT 6000.00/-) categories. Data show that two-thirds household of the study area belonged to low income

group. Conversely, only about 19 percent and 15 percent households belonged to medium and high income group (Figure 5.3).

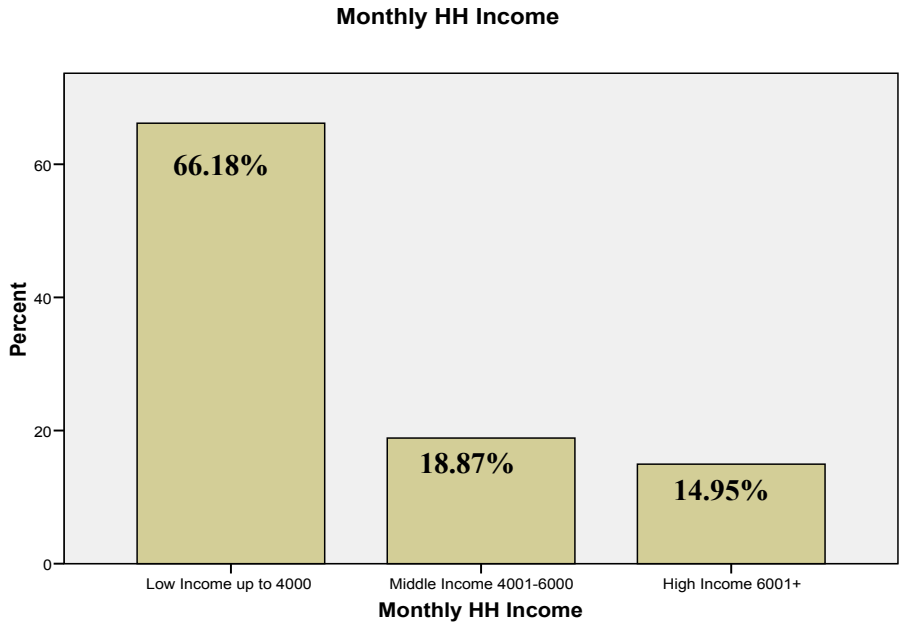

Figure 5.3: Household Categories of the Respondents

However, a significant difference was found between Ajogara and Chinaduli in respect of categorization of households based on monthly income, χ^2 (2, N = 408) = 9.213, p .010 (Table 5.11). Small income households were found higher in *Ajogara* (about 73 percent) than that of *Chinaduli* (59.31 percent). On the other hand, middle (21.57 percent) and high (19.12 percent) income groups were found higher in *Chinaduli* than that of *Ajogara* (16.18 and 10.78 percent) that indicates the improved economic condition of the people of *Chinaduli*. Better socioeconomic conditionof *Chinaduli* in terms of housing, clothing, and household equipment was also observed during field work of the study.

Table 5.11: HouseholdCategoryon the basis of Monthly Income by Village

Categories	Ajogara		Chinaduli		Total	
	Number	Percent	Number	Percent	Number	Percent
Low income	149	73.04	121	59.31	270	66.18
Middle income	33	16.18	44	21.57	77	18.87
High income	22	10.78	39	19.12	61	14.95
Total	**204**	**100**	**204**	**100**	**408**	**100**

Pearson Chi-Square: 9.213, df 2, Sig. value .010.

5.6 Savings

Savings is one of the indicators of economic strength. The practice is important to make economic base that is also helpful to make people disaster resilient**.** But it is a matter of irony that due to small income, rural people of Bangladesh can hardly save any money to generate capital for future investment (Nawaz, 2009). The same situation was found in the study area. A few of the people (8.33 percent) of the study area could hardly save money after familial expenses. In contrast, the large majority of the respondents (91.67 percent) could not save money after familial expendituredue to poverty (Table 5.12). The savings mechanisms reported by rural people included informal (cash savings at home) and formal savings (cash savings in *Shamiti* of NGOs and bank).

Table 5.12: ResponsesRegarding Saving Performance by Sex

Responses	**Male**		**Female**		**Total**	
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Could save	23	11.27	11	5.39	34	8.33
Could not save	181	88.73	193	94.61	374	91.67
Total	**204**	**100**	**204**	**100**	**408**	**100**

Pearson Chi-Square: 4.62, df 1, sig. value .032.

However, savings performance between the two categories of respondents and the respondents of two villages varied significantly. Savings capability was found higher among men (11.27 percent) than women (5.39 percent),χ^2 (1, N = 408) = 4.62, p=.032. On the other hand, more people of *Chinaduli* (12.25 percent) compared to a few people of *Ajogara* (4.41 percent) could save money after their familial expenses, χ^2 (1, N = 408) = 8.21, p = .004. That is men compared to women and the people of *Chinaduli* compared to the people of *Ajogara* were in improved position with regard to savings performance (Table 5.13).

Table 5.13: ResponsesRegarding Saving Performance by StudyVillage

Responses	**Ajogara**		**Chinaduli**		**Total**	
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**

Could save	9	4.41	25	12.25	34	8.33
Could not save	195	95.59	179	87.75	374	91.67
Total	**204**	**100**	**204**	**100**	**408**	**100**

Pearson Chi-Square: 8.21, df 1, sig. value .004.

5.7 Women's Income

Socioeconomic condition, especially per capita income, is a determining factor of one's social status. If one has significant contribution to household finances, his/her position/social status within family likely to be higher. It leads to increased participation of the person in decision-making and other activities (Rafiquallah, 1998).

Table 5.14: Monthly Income of the Female Respondents

Amount of Income	Number	Percent
No Income	138	67.65
100-1000	51	25.00
1001-2000	8	3.92
2001-3000	3	1.27
3001+	4	1.96
Total	204	100

But it is found in the present study that more than two-thirds of the sample women(67.65 percent) had no personal income at all. They had to depend on male members of their family for livelihoods. Only about one-third of them (32.35 percent) had their own income that was ranged from BDT 100.00/- to 7,000.00/- that indicates the income variations of women. However, one-quarter of the women were found within income group of BDT 100.00/- to 1000.00/- . About four percent women belonged to income group of BDT 1001.00/- to 2000.00/- followed by 1.27 percent women whose income was found to be within BDT 2001.00/- to 3000.00/-. And the remaining (about 2.00 percent) women had monthly income of more than BDT 3000.00/- (Table 5.14).

5.8 Women's Landownership

In general, women have limited access to resources such land, water, income etc. due to gendered norms. Women's access to rural agricultural land is dependent on the rights of husband or male kin. Although Muslim women are entitled to inherit half the share of their brothers from father, many women in Bangladesh leave their portion of the land with their brothers as a form of insurance against marital breakdown/instability and to ensure visits to the parental home (Sheheli, 2011). Apart from this, men are not eager to leave their command and control over resources to maintain their authority. That is why women's landownership in a patriarchal society like Bangladesh is quite less compared to men. According to World Bank (2008:73),only a few of the women (less than 10 percent) in Bangladesh have ownership of land. It was not exception in the study area in respect of landownership of women. Only 5.39 percent women were found to have landownership. On the contrary, majority of the women (94.61 percent) were found landless (Table 5.15).

Table 5.15: Distribution of Responses onWomen's Landownership

Types of Responses	Ajogara		Chinaduli		Total	
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Yes	10	9.80	1	0.98	11	5.39
No	92	90.20	101	99.02	193	94.61
Total	**102**	**100**	**102**	**100**	**204**	**100**

5.9 Women's Ownership ofOther Resources

Apart from land, other resources, whether it is hard cash or material, have economic value to determine socioeconomic status of any person. In Bangladesh, access to resources is an acute problem for women. The monetary issues are usually remaining out of the control of women (Haque & Yamao, 2008), although they have ownership of some resources that are generally considered as less valued (Begum, 1995). In the circumstances, both the male and female respondents were asked about women's ownership of resources.

Table 5.16: Opinion Regarding Women's Ownership of Resources

Opinion	Male		Female		Total	
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Yes	111	54.41	122	59.80	233	57.11
No	93	45.59	82	40.20	175	42.89

Total	**204**	**100**	**204**	**100**	**408**	**100**

In response to this question, more than half of the respondents (57.11 percent) replied that women had ownership of some resources such as cow, milch-cow, goat, duck, hen, jwellery etc.In contrast, 42.89 percent respondent reported that women did not have ownership of such resources (Table 5.16).They stated that all of the resources whatever they had were owned and controlled by men.

5.10 Women's Control over Resources

In a patriarchal society like Bangladesh, men hold the sovereign power to control everything at household and in society as a whole. Most of the women, especially in rural area, have little opportunity to exercise power and authority in decision-making process at intra-household, economic and political arena (Shekh, 2003). Less power and authority isolate women from earning income and acquiring control over resources. But women's equal access to and control over resources is critical for the achievement of gender equality and the empowerment of women and for equitable and sustainable economic growth and development (UN, 2009). But it is evident that although considerable progress in many aspects of women's socioeconomic and political empowerment has been witnessed through, for example, increasing educational attainment, share of paid work andrepresentation in decision-making in a range of areas (Hossain, 2008; UN, 2009), deeply entrenched discrimination and inequality still persist in Bangladesh. Even they have little voice to use their own resources.

Table 5.17: Opinion Regarding Decision-making in Using Resources of Women

Decision-maker	**Male**		**Female**		**Total**	
	Number	**Percent**	**Number**	**Percent**	**Number**	**Percent**
Wife alone	3	2.70	8	6.56	11	4.72
Husband alone	30	27.03	12	9.84	42	18.03
Jointly	78	70.27	102	83.60	180	77.25

Total	**111**	**100**	**122**	**100**	**233**	**100**

However, most of the women in the study area were found to be less empowered to make decisionsalone in using their own resources. Only a few of the women (4.72 percent) were found to be able to make decisions alone. But their decision-making power was found to be confined within buying and selling of petty things such as chicken, duck, eggs etc. and lending essential goods such as rice, flour, onion, salt etc. Although most of the decisions were made jointly (72.25 percent)in using women's resources, a significant number of the respondents (18.03 percent, of whom 27.03 percent men, compared to 10.00 percent women) mentioned that decision was made by men (husband) alone (Table 5.17) which indicates the male dominance at household level.

5.11 Association with GAs and NGOs

Both government agencies (GAs) andnon-government organizations (NGOs) have played a significant role in the field of poverty reduction, livelihood improvement and social protection in rural Bangladesh since late seventies. They provide social, financial and community organization services through using target group approach that emphasizes participation of the group members (Samad, 2002). However, some GAs such as Department of Social Services (DSS), Bangladesh Rural Development Board (BRDB), Department of Youth Development (DYD) etc. and NGOs such as Bangladesh Rural Advancement Committee (BRAC), Association for Social Advancement (ASA) and some local NGOs such as *Manobmukti Sangstha* and ESDO (Environmental and Social Development Organization) were found to operate their social service program in *Belkuchi* and *Islampur upazila* during study period. Target group approach was the main operating procedure of those organizations. It was expected that participation of rural people in various programs run by the above-mentioned agencies can help households cope with income shocks, ensure food security, avoid an increase in poverty or prevent households from falling below poverty line. But less involvement of the people in the study area was found in GA-NGO run programs. Only 8.82 percent male and 15.20 percentfemale respondents were found to be involved with GAs and NGOs (Table 5.18).

Table 5.18: Responses Regarding Involvement with Organization

Responses	Male	Female	Total

	Number	Percent	Number	Percent	Number	Percent
Yes	18	8.82	31	15.20	49	12.00
No	186	91.18	173	84.80	359	88.00
Total	**204**	**100**	**204**	**100**	**408**	**100**

However,the study investigated the reasons for less involvement with GA-NGO programs. It is found that prevalence of GA-NGO support services was not available in the study villages. The key informants alleged that because of river erosion,very often some people of the study area were compelled to shift their residence. Therefore, the settlement of the groups was not durable. It became difficult for the service providers to locate them and collect installment of micro-credit (if it is distributed). Therefore, GA-NGO officials are not eager to provide micro-credit and other support services among the *char* dwellers. In addition, it is very troublesome for GA-NGO officials to move easily in char areas because of underdeveloped transport system. For these reasons, very often they show their apathy to go to these villages for providing services.

5.12 Summary and Conclusion

In this chapter, various socioeconomic aspects of the respondents such as age structure, educational qualification, occupation; household pattern, landownership and monthly income; women's access to and control over resources and association of the people with organization have been analyzed to understand the social condition of *Ajogara* and *Chinaduli*. It has been noted that the respondents belonged to various age-groups. Average age of the male and female was found 41.58 and 37.86 years respectively. Most of the respondents (46.57 percent) were found middle-aged and women were comparatively younger than men. With regards to educational qualification, most of the respondents (40.20 percent) were found illiterate and about one-third could only write their names who had no formal education. Some of them were found to have completed secondary level education, but a very few of them were found to have attained Bachelor's degree.

A variety of occupations such as agricultural activities, daily laborer, rickshaw/rickshaw-van pulling and salaried works (teaching, working in NGOs) were found to be pursued by the villagers.Most of men of *Chinaduli* were found to be involved in agricultural

activities, while most of the men of *Ajogara* were found to work as handloom laborer that indicates the occupational variation of the people in the two study villages. Landlessness was found to be a compelling factor that engaged them in non-farm activities. On the other hand, 'occupation' of most of the women saw them as housewife. Like men, a few of the women were found to be engaged in teaching and working in NGOs.

However, average household size was found to be bigger in the study area compared to national level. A little less than half and one-third households were found to be medium and small in size with 5-6 and up to 4 members. But it is significant to note that 18.14 percent households were found to be large with more than 6 members. With regard to landownership, most of the households (40.44 percent) were found to be destitute who had no land at all followed by the landless (39.71). In terms of landownership, better condition was found in *Chinaduli* as marginal and small farm households were found in higher numbers in this village than in *Ajogara*. On the other hand, the number of landless households was higher in *Ajogara*. In respect of monthly income, two-third households were found to be small-income group with monthly income of up to BDT 4000.00/- who are regarded as belonging to the poorest category as per implementation manual of RSS. Improved economic condition was found in *Chinaduli* compared to that of *Ajogara* since monthly average household income as well as number of middle and high-income households were found to be higher in *Chinaduli*.

However, with regard to savings, very poor condition was found in the study area. It is observed that only a few of the people (8.33 percent) could save some money after their familial expenses. Very deplorable condition of women was found in the study area as most of them had no personal income (67.65 percent) and almost all of them (96.61) had no ownership of land, and they had limited/no access to and control over resources. Absolute male dominance was found in the economic domain and women were dependent on men. However, people's association with nation-building organizations was found to be fairly less in the study area. Actually, the prevalence of GA-NGO services was not available in the study area because of its under-developed transport and communication system and difficult location. Nonetheless, the above discussion highlights the vulnerable condition of the study area in terms of monthly income, landownership, and savings. In the circumstance how did they prepare for and respond to

disastrous situation created by flood? The answer to this question will be sought in the next chapters.

Chapter VI
Flood Preparedness Measures in the Study Sites: The Role of Stakeholders

6.1 Introduction

This chapter deals with the disaster preparedness situationof the study area.Preparedness, in general, refers to the activities designed in advance to ensure that appropriate and effective measures have been taken to avert or minimize loss of lives and properties. These actions include the disaster management plans, training of the officials involved in disaster management and the affected people, maintenance of human, material and financial resources as well as the actions related to information dissemination and education (Kreps et al. 2006; Raralio & Ebo, 2009). However, this chapter analyzes the preparedness measures adopted by the stakeholders such as government agencies (GAs), non-government organizations (NGOs), and people of the affected community as well. It focuses on the existing physical infrastructure of the study area that could protect against unexpected floods. It also discuses the services, such as training and awareness building programs, provided by GAs and NGOs at preparedness phase and the level of people's participation in these programs. Finally, it highlights the measures taken in advance by the respondents at household level to combat the floods. The discussion of this chapter is based on primary data collected through interviews, focus group discussions and non-participant observation.

6.2 Structural Measures Adopted by GAs and NGOs as Preparedness

Generally, structural and non-structural measures are adopted as preparedness strategyto combatnatural disasters (AsianDisasterReductionCenter n.d.:68-69). Structural measures refer to construction of cyclone shelter, flood control dam, road, sluice gate, bridge, culvert etc. The government and donor agencies as well asNGOs build various types of physical infrastructure as structural measures to prevent/control natural disasters like flood and also to cope with flooding. It is found that GAs and NGOs took various types of structural measures in the study area as preparedness mechanism, as per the opinion of 61.52 percent respondents, to control devastating floods and to combat the emergency situation created by floods (Figure 6.1).

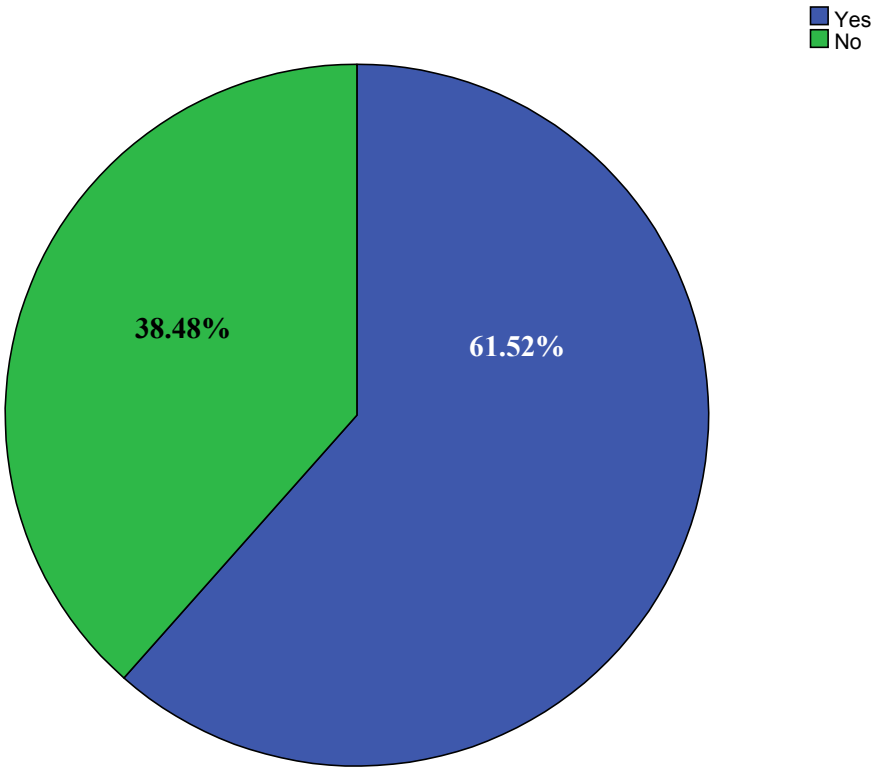

Figure 6.1: Whether infrastructural set-ups were constructed

A significant difference was found between the number of respondents of *Ajogara* and *Chinaduli* who gave their views on GAs' and NGOs' various types of structural measures, χ^2 (1, N = 408) = 188.69, p< .001. Data show that almost all of the respondents of *Chinaduli* (94.61 percent), while slightly more than one-quarter (28.73 percent) of the respondents of *Ajogara,* replied that GAs and NGOs constructed some physical infrastructures in their locality as preparedness strategy (Table 6.1).

Table 6.1: Responses Regarding Structural Measures Adopted by GAs and NGOs

Responses	**Ajogara**			**Chinaduli**			**Grand Total**
	Male	**Female**	**Total**	**Male**	**Female**	**Total**	
Yes	27 (26.47)	31 (30.39)	58 (28.43)	92 (92.20)	101 (99.02)	193 (94.61)	251 (61.52)
No	75 (73.53)	71 (69..61	146 (71.57)	10 (9.80)	1 (0.98)	11 (5.39)	157 (38.48)
Total	**102 (100)**	**102 (100)**	**204 (100)**	**102 (100)**	**102 (100)**	**204 (100)**	**408 (100)**

Percentages have been shown in parenthesis

6.2.1 Constructing Authority of the Physical Infrastructure

Local government bodies are responsible for the development of the respective areas. Accordingly, local government, especially the Union *Parishad* (UP), the lowest tier of three-tier rural local government system of Bangladesh, constructs road, bridge, culvert, academic institutions etc. for the overall development under public works program. These infrastructural set-ups are also inalienable part of structural measures of disaster management as these infrastructures are used to prevent flood and cope with flooding. According to a large majority of the respondents (89.24 percent), the Union *Parishad* constructed the physical infrastructure such as bridges; culvert, flood control dam etc. in the study area as preparedness strategy.Local Government Engineering Department (LGED) and NGOs also built some set-ups of infrastructure in the study area as per opinion of 16.73 and 16.33 percent respondents respectively (Table 6.2).However, people's participation was not found in this respect.

Table 6.2: Distribution of Constructing Authority of the Physical Infrastructure

Name of the authority	Ajogara (n=58)		Chinaduli (n=193)		Total (n=251)	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Union *Parishad*	40	68.97	184	95.34	224	89.24
NGO	7	12.07	35	18.13	42	16.73
LGED	17	29.31	24	12.44	41	16.33

6.2.2 Types of Physical Infrastructure Constructed as Preparedness

According to three-quarter (75.65 percent) of the respondents of *Chinaduli* and more than one-quarter (27.59 percent) of the respondents of *Ajogara*, the government authority (UP, LGED) built bridges and culverts (Table 6.3) as preparedness to ease the passing away of rain water and movement of the people during rainy season. Therefore, despite the heavy and incessant rains, early flood or water logging was not created in some parts of the study area that were located inside the flood control dam/*kancha* road. Key informants also acknowledged the contribution of the above-mentioned authority in this regard.However, a little lees than half of the total respondents (46.22 percent), of whom more than two-thirds (69.00 percent) in *Ajogara* and about 40 percent in *Chinaduli,* and majority of the key informants reported that the UP built flood control dams to prevent unusual flood. But it was observed that those dams were not heavy concrete dam, rather

narrow *kancha* roads. Those *kancha* roads, locally known as flood control dams, were not strong enough to prevent the watercourse. Rather they broken down due to strong flow of the water and *Ajogara*, one of the study villages, was suddenly inundated during the last flood.

Table 6.3: Types of Physical Infrastructure Built as Preparedness

Physical infrastructure	Ajogara (n=58)		Chinaduli (n=193)		Total (n=251)	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Bridge/culvert	16	27.59	146	75.65	162	64.54
Flood control dam	40	68.97	76	39.38	116	46.22
Sluice-gate	0	0	8	4.17	8	3.20

However, a few of the respondents of *Chinaduli* (4.17 percent) said that LGED built some sluice gates to prevent the rush of flood water. But there was no sluice gate in *Ajogara*. It was observed, during initial stage of data collection, that sluice gates protected *Chinaduli* from early flood. It should be mentioned that NGOs constructed narrow *kancha* roads in association World Food Program.

6.2.3 RepairingPhysical Infrastructure before Floods

It becomes very necessary to repair thephysical infrastructure before floods since these infrastructure set-ups are, more or less, damaged by flood every year. If these damaged structures are not repaired before floods, then those may increase the risk of floods and will intensify the sufferings of the people. Therefore, the study investigated whether the damaged physical infrastructure of the study area was repaired before floods. Most of the respondents (85.66 percent) of whom 94.30 percent of *Chinaduli*, compared to 56.90 percent in *Ajogara,*replied that existingphysical infrastructure was repaired before the last flood (Table 6.4).

Table 6.4: Responses on Repairing Physical Infrastructure before Flood

Responses	Ajogara		Chinaduli		Total	
	Number	Percent	Number	Percent	Number	Percent
Yes	33	56.90	182	94.30	215	85.66
No	25	43.10	11	5.70	36	14.36
Total	**58**	**100**	**193**	**100**	**251**	**100**

6.2.4 Repairing Authority of the Physical Infrastructure

Like building the physical infrastructure,the Union *Parishad* (UP) did the major portion of repairing works as per opinion of a large number of the respondents (95.81 percent), of whom about 88 percent were from *Ajogara* and abut 97 percent were from *Chinaduli*. NGOs also repaired some damaged roads before flood as per the opinion ofabout one-third of the respondents. It is significant to mention that although cooperative associations completed some repairing works in *Chinaduli,* this kind of initiative was not found in *Ajogara*. It should be further mentioned that although people of the community participated in repairing works in organized form through cooperative associations little participation at individual level was found in this regard (Table 6.5).

Table 6.5: Distribution of the Authority of Repairing Physical Infrastructure

Name of the authority	**Ajogara (n=33)**		**Chinaduli (n=182)**		**Total (n=215)**	
	Freq.	**Percent**	**Freq.**	**Percent**	**Freq.**	**Percent**
Union *Parishad*	29	87.88	177	97.25	206	95.81
NGO	4	12.12	66	36.26	70	32.56
Cooperative Assoc	0	0	30	16.48	30	13.95
Community	1	3.03	1	0.54	1	0.93

It should be noted that although some of the people were found to be involved inrepairing worksof the above-mentioned physical infrastructure, none of the respondents were found to participate in those works due to various reasons that conform to the following statements. One of the respondents,Md. Abdur Razzak, 50 years old farmer of *Chinaduli* stated:

I did not participate in repairing works of the road. Actually, I was tremendously busy with my agricultural works. So it was not possible for me to participate in repairing works of the road. But we should participate in this work for the betterment of all.

Another respondent, Gaffar, 45 years old rickshaw puller of *Chinaduli* said:

> *I could not participate in repairing works of the road because of my involvement with other works. Basically, I pull rickshaw from dawn to dusk at Islampur town for maintaining my family. I have to go to Islampur everyday. I went to Islampur on that day too while the road was being*

repaired. But I realize that I should have abstained from rickshaw pulling at least on that day and participated in the repairing work of the road as social responsibility.

6.3 Non-Structural Measures Adopted by GAs and NGOsas Preparedness

Non-structural measures are important, like structural measures, to combat disasters. Non-structural practices are related to policy-making action and coordination among the stakeholders (GAs, voluntary agencies, civil society, and affected community). Broadly, it is connected with adoption of disaster management legislation, national disaster management policy and disaster management plan; arrangement of training program and workshop, and introduction of institutional framework. Accordingly, the Government of Bangladesh (GoB) has already established Disaster Management Bureau, councils and committees at the national, district, *upazila* and union levels. Aseries of inter-related institutions, both at national and sub-national levels, have also been created to ensure effective planning and coordination of disaster riskreduction and emergency response management (MoFDM 2007:49-50) which are as follows:

Institutional framework at the national level includes National Disaster Management Council, Inter-Ministerial Disaster Management Co-ordination Committee, National Disaster Management Advisory Committee, Cyclone Preparedness Program Implementation Board, Disaster Management Training and Public Awareness Building Task Force, Focal Point Operation Coordination Group of Disaster Management, NGO Coordination Committee on Disaster Management, and Committee for Speedy Dissemination of Disaster Related Warning/Signals. Institutional framework at the sub-national level includes District Disaster Management Committee, *Upazila* (sub-district)Disaster Management Committee, Union Disaster Management Committee,*Pourashava* Disaster Management Committee, and City CorporationDisaster Management Committee.

However, some UP members of both *Daulatpur* and *Chinaduli* and chairman of *Chinaduli* UP claimed that they formed disaster management committee for their respective UPs but the existence of a formal committee was not found in any of the UPs. They also (UP members and chairman) claimed that meeting of these committees was held now and then during flood, but hardly during normal period. Again, they mentioned

that they have prepared union disaster management plan for their respective UPs but they could not explain the subject-matter of the plan. Therefore, disaster management committee and plan at union level were not found to function at all, rather found conceptually. Even they did not assess the needs of the people properly. But the UP provided the people with some services along with constructing infrastructure for better preparedness.

6.3.1 Prevalence of Services Provided by GAs and NGOs as Non-Structural Measures

The GAs and NGOs provide some services as their non-structural disaster mitigation efforts for better preparedness at community level, apart from constructing and repairing physical infrastructures (Hossain, 2012).The study area was no exception in this regard. Most of the respondents (69.61 percent)from both categories (male 67.65 percent andfemale 71.57 percent) opined that apart from building physical infrastructure, GAs and NGOs provided various types of services for preparedness. But a significant difference was found between the number of respondents of *Ajogara* and *Chinaduli,*χ^2 (1, N = 204) = 51.61, p< .001 for male and *Likelihood Ratio* (1, N = 204) = 92.34, p< .001 for female (Table 6.6).

Table 6.6: Opinion onWhether Services Provided by GAs &NGOs for Preparedness

Responses	**Male**			**Female**			**Grand Total**
	Ajogara	**Chinaduli**	**Total**	**Ajogara**	**Chinaduli**	**Total**	
Yes	45 (44.12)	93 (91.18)	138 (67.65)	45 (44.12)	101 (99.02)	146 (71.57)	284 (69.61)
No	57 (55.88)	9 (8.82)	66 (32.35)	57 (55.88)	1 (0.98)	58 (28.43)	124 (30.39)
Total	**102 (100)**	**102 (100)**	**204 (100)**	**102 (100)**	**102 (100)**	**204 (100)**	**408 (100)**
	Pearson Chi-Square: 51.61, df 1, Sig. Value .000			**Likelihood Ratio:92.34, df 1, Sig. Value .000**			

Percentages have been shown in parenthesis.

Data show that although a large number of male (91.18 percent) and almost all of the female respondents (99.02 percent) of *Chinaduli* reported that GAs and NGOs provided services for better readiness, and the percentage of both male and female respondentsof *Ajogara* was only 44.12 percent, which indicates that the location of the study area was significantly associated with providing services by GAs and NGOs, (φ = ±.55, df=1, p<.001).

6.3.2 Agencies Provided Services in Preparedness Phase

It is found that the GAs such as the Union *Parishad*(UP),BRDB and Department of Social Services (DSS) and NGOs viz. *Manobmukti Sangstha, Souhardo*, National Development Program (Char Livelihood Project); ESDO provided various types of services in the study area in preparedness phase. According to more than three-quarter of the respondents, the UP (78.87 percent) and NGOs (78.52 percent) provided a variety of services for preparedness. Only a few of the male respondents said that BRDB (15.22 Percent) and DSS (9.42 percent) also provided some services for preparedness (Table 6.7). But their contribution was very negligible in this phase.

Table 6.7: Distribution ofService Provider Agencies in Preparedness Phase

Agencies	Male (n=138)		Female (n=146)		Total (n=282)	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
UP	105	76.09	119	81.51	224	78.87
NGOs	103	74.64	120	82.19	223	78.52
BRDB	21	15.22	-	-	21	7.39
DSS	13	9.42	-	-	13	4.58

One of the key informants (union social worker) acknowledged limitations in providing services in this phase in the following way:

> *We remain tremendously busy with administrative work in the year-round. We have to prepare the list of beneficiaries of social safety net programs and distribute the allowances among them. Therefore, we could not provide additional servicesfor preparedness to combat floods. But our services are also helpful for the beneficiaries to be prepared to combat the flood.*

6.3.3 Types of Services Provided by GAs and NGOs in Pre-Disaster Phase

It is obvious as per opinion of the respondents that both GAs and NGOs provided various types of servicesin pre-disaster phase as non-structural measures to make the community disaster-resilient. The respondents were requested to reveal the types of services provided by the aforementioned organizations. The respondents replied that GAs and NGOs provided them with various kinds of services such as providing training, creating awareness, and transferring cash money and technology to enhance the preparedness

process (Table 6.8). According to around tow-thirdsof the male respondents (64.76 percent), the UP provided themwith training as well as operated awareness-building programs for skill development of the people so that they could combat the flood with efficiency. The UP also transferred modern agricultural technology with assistance of Agriculture Extension Department (52.38 percent) to enhancethe coping capacity of the farmers to deal with flood (Table 6.8).

Table 6.8: Opinion of the Male about Types of Services Provided by GAs and NGOs

Agencies ⟶ / Types of Services ↓	UP (n=105) Frequency (%)	NGOs (n=103) Frequency (%)	BRDB (n=21) Frequency (%)	DSS (n=12) Frequency (%)
Training	68 (64.76)	56 (54.37)	7 (33.33)	2 (16.67)
Awareness building	68 (64.76)	71 (68.93)	11 (52.4)	3 (25.00)
Cash transfer	-	46 (44.66)	9 (42.9)	6 (50.00)
Technology transfer	55 (52.38)	5 (4.85)	-	-

Like the UP, NGOs also operated awareness building program (68.93 percent), arranged training program (54.37 percent), provided micro-credit (cash transfer) (44.66 percent) and transferred technology (4.85 percent) among the villagers. Although BRDB and DSS provided training and operated awareness building program,their contribution was negligible compared to other agencies (Table 6.8).

Table 6.9: Opinion of the Female about Types of Services Provided by GAs and NGOs

Agencies ⟶	UP (n=119)		NGOs (n=120)	
Types of Services ↓	Frequency	Percent	Frequency	Percent
Training	91	76.47	64	53.33
Awareness building	111	93.28	102	85.00
Cash transfer	19	15.97	46	44.66
Technology transfer	16	13.45	3	2.50
Others	6	5.04	2	1.67

According to majorityof the female respondents, the UP (93.28 percent) and NGOs (85.00 percent) operated awareness building program to enhance the knowledge base of the flood affected community so that they could cope with flood situation

effectively.Other programs run by the UP and NGOs were: providing training for skill development, cash transfer for creating resource base and technology transfer for the adaptation in agricultural sector (Table 6.9).

6.3.4 Providing Training as Preparedness Mechanism

Training is a process of developing and improving skills of trainee (Blum and Naylor 1968:37 and DemocracyWatch 2002:23). It is a process of learning by which participants acquire skills, concepts, and knowledge to aid in the achievement of goals (Mithis and Jackson 1979:213). Therefore, both GAs and NGOs provided the flood affected people with training on various issues for skill development so that they could take preparation in advance to cope with the situation created by flood.

Table 6.10: Distribution of Responses about Subject-Matters of Training

Subject-Matters of Training	Male (n=106)		Female (n=125)		Total (n=231)	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Primary health care	60	56.60	105	84.00	165	71.43
Water purification	41	38.68	106	84.80	147	63.63
Food preservation	78	73.58	53	42.40	131	56.71
Seed preservation	62	58.49	52	41.60	114	49.35
Poultry rearing	31	29.25	79	63.20	110	47.62
Action in snake-biting	38	35.84	59	47.20	97	42.00
Preserving cattle-food	29	27.35	42	33.60	71	30.74
Sheltering	34	32.08	36	28.80	70	30.30
Protecting livestock	26	24.52	37	29.60	63	27.27
Cultivation of crops	26	27.36	15	12.00	44	19.05
Tailoring	8	7.55	13	10.40	21	9.09

Table 6.10 shows that a large majority of the respondents (71.43 percent), of whom 84.00 percent women, compared to 56.60 percent men,mentioned that GAs and NGOs provided training on primary health care. The trainers taught the participants how to manage diarrhea, fever, cold fever, dysentery etc. Second highest number of the respondents (63.63 percent), of whom 85 percent women, compared to 38.68 percent men, opined that the trainers taught the participants how to purify water so that the flood affected people could purify water during flood to cope with the crisis of pure drinking water. However,

GAs and NGOs provided training in food preservation, as reported, to more than half of the respondents (56.71 percent). The trainers taught the participants how to and what kinds of foods have to be preserved for disaster period.

However, the trainers emphasized in training session on preserving dry foods such as *chira* (flattened rice), *muri* (puffed rice), *khoi* (parched/toasted paddy), and rice, molasses etc. in dry place. On the other hand, about half of the respondents mentioned that GAs and NGOs provided training on how to preserve seed for post-flood cultivation. Other subject-matters of training program were sheltering, action in snake biting, protecting livestock, preserving cattle food, cultivation of flood-tolerant crops, poultry-rearing and tailoring. The subject-matters of training program were related to techniques of continuing livelihood during flood as well as resource mobilization. Training in food preservation, water purification, and primary health care was related to continuing livelihood during devastating period. On the other hand, training in cultivation of flood-tolerant crops, poultry-rearing and tailoring was related to enhancing resource mobilization.

6.3.4.1 Prevalence of Participation in Training

Although both GAs and NGOs provided the villagers with training for skill development and enhancing resource mobilization, widespread participation of the people was not found in the study area, while prevalence of participation in training was referred to the number of the respondents attended training programs during last four years (2007-2011). Data show that only 41.51 percent male and 40.00 percent female respondents received the training. In contrast,majority of the respondents (male 58.49 percent and female 60.00 percent) did not participate in training programs (Table 6.11).

Table 6.11: Distribution of Responses to Participation in Training by Sex

Responses	Male		Female		Total	
	Number	Percent	Number	Percent	Number	Percent
Participated	44	41.51	50	40.00	94	40.69
Not Participated	62	58.49	75	60.00	137	59.31
Total	**106**	**100**	**125**	**100**	**231**	**100**

6.3.4.2 Analytical Variables and Women's Participation inTraining

The present study investigated whether the age structure, educational qualification, organizational involvement (membership of organization)and household income of the female respondents had any association with participation in training program. The study finds significant relationship of the age structure, (φ_c=.232, df=2, p=.034) and organizational involvement (φ=.323, df=1, p<.001) of women with their participation in training program.

Age Structure and Women's Participation in Training Programs

Data show that more than half of the women of young category of 21-35 years (52.73 percent) participated in training program offered by GAs and NGOs. In contrast, less than one-third (30.65 percent) of the women of middle age of 36-50 years and one-quarter of the aged women of 51-65 years participated in training program that indicates the prevalence of higher participation of young women than middle aged and aged women in training program, *Likelihood Ratio (LR),*χ^2 (2, N = 125) = 6.760, p =.034.

Table 6.12: Relationship of Age with Women's Participation in Training Programs

Whether Participated in Training	Age Structure			Total
	Young	Middle aged	Aged	
Participated	29 (52.73)	19 (30.65)	2 (25.00)	50 (40.00)
Not participated	26 (47.27)	43 (69.35)	6 (75.00)	75 (60.00)
Total	55 (100)	62 (100)	8 (100)	125 (100)

Likelihood Ratio: 6.760, df 2, Sig. value .034. Cramer's V .232.
Percentages have been shown in parenthesis.

Educational Qualification and Women's Participation in Training Programs

In case of link with educational qualification of the female respondents, a little bit higher participation was found among the illiterate women (41.76 percent) than who had completed grade 1-5 (38.46 percent), grade 6-10 (36.36 percent) and completed SSC and above degrees (30.00 percent). Although the degree of participation of women in training program varied between the different categories in terms of educational qualification, it was not significant,$LR\chi^2$ (3, N = 125) = .623, p =.895 (Table 6.13).

Table 6.13: Educational Status and Women's Participation in Training Programs

Whether Participated in Training	Educational Attainment				Total
	Illiterate	Grade 1-5	Grade 6-10	SSC+	
Participated	38 (41.76)	5 (38.46)	4 (36.36)	3 (30.00)	50 (40.00)
Not participated	53 (58.24)	8(61.54)	7 (63.64)	7 (70.00)	75 (60.00)
Total	91 (100)	13(100)	11 (100)	10 (100)	125 (100)

Pearson Chi-Square: .519, df 2, Sig. value .771, Cramer's V .064
Percentages have been shown in parenthesis.

Membership of Organization and Women's Participation in Training Programs

In case of relationship between membership of organization and women's participation in training program, higher participation was found among the women who had involvement with any organization (81.25 percent) than who had no such involvement (33.94 percent), that indicates the significant variation between the participation of two categories of women, *Likelihood Ratio* (1, N=125) =13.009, p<.001 (Table 6.14). It appears that women's participation was positively associated with their involvement in any organization (membership of organization) (φ=.323, df=1, p<.001).

Table 6.14: Membership of Organization and Women's Participation in Training

Whether Participated in Training	Membership of Organization		Total
	Yes	No	
Participated	13 (81.25)	37 (33.94)	50 (40.00)
Not participated	3 (18.75)	72 (66.06)	75 (60.00)
Total	16 (100)	109 (100)	125 (100)

Likelihood ratio 13.009, df 1, sig. value .000. Phi .323
Percentage is shown in parenthesis.

Household Income and Women's Participation in Training Programs

In case of relationship ofhousehold incomewith participation of women in training program, significant difference was found in participation of women of different income groups,*Likelihood Ratio* (2, N = 125) = 6.797, p =.033. Higher participation was found among the women of middle income group (57.14 percent) than that of low (38.96

percent) and high income (20.00 percent) that indicates non-linear relationship (Table 6.15).

Table 6.15: Household Income and Women's Participation in Training Programs

Whether Participated in Training	Household Category			Total
	Small income	Middle income	High income	
Participated	30 (38.96)	16 (67.14)	4 (20.00)	50 (40.00)
Not participated	47 (61.04)	12 (42.86)	16 (80.00)	75 (60.00)
Total	77 (100)	28 (100)	20 (100)	125 (100)

Likelihood Ratio = 6.797, df 2, Sig. value .033. Percentage is shown in parenthesis.

6.3.4.3 Reasons for Non-Participation in Training Programs

It is found in earlier sections that majority of the respondents (59.31 percent), both men (58.49 percent) and women (60.00 percent), did not participate in training programs organized by GAs and NGOs. But why did the large number of the respondents not avail these opportunities as it enhances the skill and knowledge of the participants? The respondents expressed a variety of reasons for non-participation in training programs. However, lack of dissemination of information about training program was found as one of the causes behind less participation of the people in training program in the study area. The respondents alleged that they did not get informationearlier about the training program. The authority of the training-providing agency did not inform them properly. They also reported that they had to do a lot of work from dawn to dusk for their livelihood. They could not manage time for participating in training program. Therefore, stress of too much work of household might be regarded as another reason for non-participationin training program.

In addition, female respondents, who did not participate in training program, reported that because of social and religious restrictions they could not participate in the training program. Some verbatim quotations of the respondents are presented below to have a better understanding. Azimuddin (a 55-year-old farmer), one of the respondents of *Chinaduli,* explained the reasonsfor not participating in training programs in the following way:

> *"I did not know earlier that the training program will be held. Nobody informed the matter earlier. If I were informed on the matter earlier, then I could manage time to participate in the program. Actually, I heard about the training program from one of my neighbors after conclusion of itwhere he participated andlearnt about techniques of preserving seed, water purification, and primary health care."*

Fatema (a 47-year-old housewife), one of the female respondents of *Ajogara*, stated:

> *"I was tremendously busy with my household works as well as other jobs while training was being held. Basically, I had to do additional work outside the home vicinity to earn some moneydue to economic hardship. I also had to spin cotton thread at home. Therefore, I could not participate in the training program given by the UP."*

Another female respondent of *Chinaduli* stated:

"Training was held at primary school and conducted by unknown males. Our religion (Islam) does not allow women to appear before strangers. Therefore, I did not participate in the training program," (Afroza, a 39-year-old housewife).

6.3.5 Building Awareness as Preparedness Mechanism

It is found that GAs and NGOs arranged awareness building program in the study area to enhance the level of awareness of the people regarding various issues related to preparedness, response and recovery phase so that they could take necessary measures in advance to combat the flood situation. The GAs and NGOs emphasized what should be done before, during and after floodsin awareness building programs. According to more than two-thirds of the respondents (68.79 percent, of whom 87.50 percent were women, compared to 49.28 percent men), GAs and NGOs created awareness of the people of importance of drinking pure water, especially during and after floods, so that they could lead healthy life as well as remain safe from water-borne diseases.

However, a large number of the respondents (62.06 percent), among them more than three-quarters were from female and about 45 percent were from male category, mentioned that the speakers of the awareness-building program emphasized maintaining cleanliness, especially during flood. The organizers of the awareness building programs explained the importance of remaining neat and clean to prevent quick spread of diseases

during flood. Like drinking pure water and maintaining cleanliness, more than half of the respondents (57.09 percent) replied that the officials of GAs and NGOs encouraged the participants to eat nutritious food in order to lead healthy life (Table 6.16). They also informed the people as to which food contains necessary vitamins and other ingredients of balance diet.

Table 6.16: Distribution of Components of AwarenessBuilding Programs

Components of AwarenessBuilding Program	Male (n=138)		Female (n=144)		Total (n=282)	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Drinking pure water	68	49.28	126	87.50	194	68.79
Cleanliness	62	44.93	113	78.47	175	62.06
Eating nutritious food	50	36.23	111	77.08	161	57.09
Preserving dry food	86	62.32	58	40.28	144	51.06
Importance of treatment	60	43.48	84	58.33	144	51.06
Preserving seed	72	52.17	63	43.75	135	47.87
To be done after flood	34	24.63	98	68.06	132	46.81
Food contains nutrition	35	25.36	96	66.67	131	46.45
Caring of livestock	49	35.51	65	45.14	114	40.43
Caring of children and elder	55	39.86	45	31.25	100	35.46

In addition, slightly more than half of the respondents (51.06 percent), of whom 62.32 men, compared to 40.28 percent women, said that GAs and NGOs created awareness among the villagers about the importance of preserving dryfood for consuming during flood. Another 51.06 percent of the respondents reported that emphasis was given on importance of receiving treatment in due time. Table 6.16 shows that the organizers of the awareness-building programs also created awareness about what should be done after flood to return to regular livelihood (46.81 percent), necessity of taking care of livestock (40.43 percent), and necessity of taking care of children and elderly people (35.46 percent).

6.3.5.1 Means ofBuilding Awareness

It is found in the preceding section that both GAs and NGOscreated awareness about various issues related to combating flood. They created awareness among the people

through various activities. Data show that both GAs (Ministry of Health and Family Planning, Department of Public Health Engineering) and NGOs distributed poster and leaflet mentioning what should be done and what should not be done before, during and after flood as per the opinion of more than half of the respondents (56.03 and 50.71 percent respectively).

Table 6.17: Distribution of Means of AwarenessBuilding Activities

Means of AwarenessBuilding Program*	Male (n=138)		Female (n=144)		Total (n=282)	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Distributing poster	52	37.68	106	73.61	158	56.03
Distributing leaflet	56	40.58	87	60.42	143	50.71
Showing short film	52	37.68	96	47.92	121	42.91
Community meeting	65	47.10	44	30.36	109	38.65
Training program	59	42.75	36	25.00	95	33.69
Group discussion	39	28.26	47	32.64	86	30.50
Showing street drama	22	15.94	37	25.69	59	20.92
Announcing by microphone	22	15.94	11	7.64	33	11.76

Table 6.17 shows that awareness was also created through entertainment. A significant number of the respondents (42.92 percent) reported that the UP (UP disaster management committee) arranged short film show demonstrating a flood situation to the people. It helped the people to understand the consequences of flood and roles and responsibilities of the people during flood. The UP and NGOs also arranged community meeting and group discussion for creating awareness among the people. Both the respondents and key informants mentioned the '*uthan boithok*' (meeting at courtyard) as important means of awareness building program where various issues related to flood management were discussed. Among other activities, cited by the respondents as means of awareness building, were training program (33.59 percent), showing street drama (20.92 percent) and announcing duties and responsibilities of the people through microphone (11.70 percent) before and during flood.

6.3.5.2 Prevalence of Participation in AwarenessBuilding Activities

Although GAs and NGOs arranged a variety of awareness building activities such as community meeting, group discussion, training program, etc. the prevalence of participation of the respondents in these activities was found to be low, while prevalence of participation was referred to the number of the respondents attended awareness building activities during last four years (2007-2011).However, participation of the male respondentsin awareness building program was found significantly higher (58.70 percent) than that of female respondents (27.08 percent), χ^2 (1, N = 282) = 28.808, p <.001 (Table 6.18). It should be mentioned that only 30.43 percent wives of the male respondents participated in awareness building program.

Table 6.18: Prevalence of Participation in Awareness Building Activities by Sex

Responses	Male		Female		Total	
	Number	Percent	Number	Percent	Number	Percent
Participated	81	58.70	39	27.08	120	42.55
Not Participated	57	41.30	105	72.92	162	57.45
Total	**138**	**100**	**144**	**100**	**282**	**100**

Pearson Chi-Square: 28.808, df 1, Sig. value .000.

6.3.5.3 Variation in Women's Participation in Awareness building Programs: Selective Determinants

The study investigated whether age structure, level of education, organizational involvement (membership of organization) and household income of the female respondents had any association with their participation in awareness building program.

Age Structure and Participation of Women in AwarenessBuilding Programs

Variation was found inprevalence of women's participation in awareness building program of different age groups, *Likelihood Ratio (LR)* χ^2(2, N =144) = 9.805, p=.008.Prevalence ofparticipation of young women (39.68 percent) was found higher compared to middle aged (15.71 percent) and aged women (27.27 percent). It is obvious that middle- aged women had least participation compared to other two groups that indicates the non-linear relationship betweenage structure andparticipation of womenin awareness building program (Table 6.19).

Table 6.19: Age Structure and Participation of Women in Awareness Building Programs

Whether Participated	Age Structure			Total
	Young	Middle-aged	Aged	
Participated	25 (39.68)	11 (15.71)	3 (27.27)	39 (27.08)
Not participated	38 (60.32)	59 (84.29)	8 (72.73)	105 (72.92)
Total	63 (100)	70 (100)	11 (100)	144 (100)

Likelihood Ratio: 9.805, df 2, Sig. value .008. Percentage is shown in parenthesis

Level of Education and Participation of Women in AwarenessBuilding Programs

The study investigated whether educational qualification of the women had association with their participation in awareness-building programs. Variation was found in participation of different groups of women in awareness building programs in terms of educational qualification. But the variation was not statistically significant, $LR\ \chi^2$ (3, N = 144) = 3.310, p=.375. Data show that the women completed grade 1-5 (33.33 percent) and grade 6-10 (41.67 percent) had more participation in awareness building program compared to illiterate (26.17 percent) and who had completed SSC and higher degree (10.00 percent). The findings indicate that women's participation was not significantly associated with their educational qualification (Table 6.20).

Table 6.20: Educational Qualification andWomen's Participation in Awareness Building Programs

Whether Participated	Educational Qualification				Total
	Illiterate	Grade 1-5	Grade 6-10	SSC+	
Participated	28 (26.17)	5 (33.33)	5 (41.67)	1 (10.00)	39 (27.08)
Not participated	79 (73.83)	10 (66.67)	7 (58.33)	9 (90.00)	105 (72.92)
Total	107 (100)	Grade 1-5	12 (100)	10 (100)	144 (100)

Likelihood Ratio: 3.310, df 3, Sig. value .375. Percentage is shown in parenthesis.

Organizational Involvement and Women's Participation in Awareness Building Programs

Contrasting evidence was found in Table 6.21 with regard to relationship between participation of women in awareness building program and their involvement with/membership of organization,χ^2 (1, N = 144) = 7.967, p =.005. Data show that the

women who were involved with any organization had higher participation (52.38 percent) in awareness building programs compared to women who had no such involvement (22.76 percent). The findings indicate the positive relationship between women's participation in awareness building programsand their membership of organizations (φ=.235, df =1, p=.005).

Table 6.21: Organizational Involvement and Women's Participation in Awareness Building Programs

Response about Participation	Status of Membership		Total
	Member	Non-member	
Participated	11 (52.38)	28 (22.76)	39 (27.08)
Not participated	10 (47.62)	95 (77.24)	105 (72.92)
Total	21 (100)	123 (100)	144 (100)

Pearson Chi-Square: 7.967, df 1, Sig. value .005. Phi .235. Percentage is shown in parenthesis.

Household Income and Women's Participation in Awareness Building Programs

It is mentioned earlier that the present study examined the relationship between household income and participation of women in awareness building programs. The findings show that more than one-third (41.38 percent) of the women of middle-income household, about one-quarter (24.47 percent) women of the low-income household and less than one-fifth (19.05 percent) women of high-income household, participated in awareness building programs. Although women of middle-income household had higher participation than other two groups, it was not statistically significant, $LR\ \chi^2$ (2, N = 144) = 3.824, p = .134 (Table 6.22).

Table 6.22: Household Income and Women's Participation in AwarenessBuilding Programs

Response about Participation	Household Income			Total
	Low-income	Middle-income	High-income	
Participated	23 (24.47)	12 (41.38)	4 (19.05)	39 (27.08)
Not participated	71 (75.53)	17 (68.62)	17 (80.95)	105 (72.92)
Total	94 (100)	29 (100)	21 (100)	144 (100)

Likelihood Ratio: 3.824, df 2, Sig. value .134. Percentage is shown in parenthesis.

6.3.5.4 Reasons for Non-Participation of Women in Awareness Building Activities

It is found earlier that a significant number of female respondentsand wives of male respondents did not participate in any awareness building program. The study investigated the reasons for non-participation of women.

Table 6.23: Reasons for Non-Participation of Women in AwarenessBuilding Activities

Male (n=96)		Female (n=105)	
Reasons	Frequency (%)	Reasons	Frequency (%)
Religious restriction	38 (39.58)	Stress of work	51 (48.57)
Stress of work	38 (39.58)	Not informed earlier	34 (32.38)
Men are enough	17 (17.71)	Religious restriction	26 (24.76)
Ageing	9 (9.38)	No benefit	13 (12.38)
No benefit	8 (8.33)	Caring children and elders	5 (4.76)
		Ageing	4 (3.81)

More than one-third of the male respondents (39.58 percent) illustrated that because of religious restriction and stress of too much work, their wives could not participate in awareness building programs. On the other hand, some of the men (17.71 percent)believed that women had no need to participate in awareness building program as they (men) were aware and experienced enough regarding flood management.A few of the men (9.48 percent) also replied that their wives did not participate in the above mentioned programs as they were not physically fitdue to ageing (Table 6.23).

However, the study finds various reasons for non-participation of female respondents. Data show that about half of the female respondents (48.57 percent) did not participate in the awareness building program because of too much stress of work. They did not get enough time to participate in awareness building program after accomplishing their regular household works. Nevertheless, lack of dissemination of information about awareness building activities caused non-participation of women. About one-third of the women (32.38 percent) alleged that they did not get information earlier aboutawareness building programs; that is why despite the willingness they could not participate in these programs. Religious restriction was found as another reason behind less participation of

women as per the opinion of one-quarter of the female respondents. They reported thatIslamic rules do not allow women's movement in public place. As a result, they did not attend those programs. However, a few of them also believed thatawareness building programs had no usefulness to them, that is why they did not participate in these programs. It is also found that a few of the women could not participate in those programs due to their remaining busy taking care of elders and children (4.76 percent) and because of ageing (3.81 percent)(Table 6.23).

6.4 Preparedness MechanismsAdopted at Household Level

People of the flood-affected area adopt a number of measures before flood as preparedness mechanism to combat flood and reduce the degree of damages caused by flood (Paul & Routray, 2010; Younus, 2010). The study area was no exception in this regard. Data show that the people of the study area took a number of measures before flood as preparedness strategy so that they could protect their resources and properties from the deluge and continue their livelihood in spite of difficulties created by flood. It is found that the majority of the people in the study area (90.44 percent)raised the plinth of their houses up to the mark of the previous flood level, so that they could save their dwelling house and other properties from deluge and stay at their homestead during flood (Table 6.24).

It should be noted that some people of *Ajogara* got financial support under char livelihoods program (CLP) to raise the plinth of their homestead. One of the key informants, M. A. Hamid, the UP member of *Daulatpur*, claimed that they helped the char dwellers in raising the plinth of their houses under Char Livelihood Program (CLP) along with distributing cows and goats and providing training. Some of the respondents also acknowledged the fact of receiving assistance under CLP. However, three-quarters (75.49 percent) of the respondents (61.27 percent men, compared to 89.71 percent women) were found to preserve dry fuel for using in the crisis moment. Slightly less than three-quarters (71.81 percent) of the respondents (57.35 percent of men, compared to 86.27 percent of women) reported that they preserved dry food such as rice, *chira, muri*, etc. for consuming in disaster period. According to more than half of the respondents (58.33 percent), they laid the tube-well at upper place to save the source of pure drinking water.

Table 6.24: Distribution of Preparedness Mechanisms Adopted at Household Level

Preparedness Mechanism	Male (n=204)		Female (n=204)		Total (n=408)	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Raising plinth of homestead	174	85.29	195	95.59	369	90.44
Preserving food for crisis period	125	61.27	183	89.71	308	75.49
Preserving food for crisis period	117	57.35	176	86.27	293	71.81
Setting tube-well in high place	84	41.18	154	75.49	238	58.33
Raising floor of the house	120	58.82	106	51.96	226	55.39
Preserving seed in safe place	95	46.57	88	43.14	183	44.55
Preserving cattle-food	72	35.29	72	35.29	144	35.29
Moving house to upper place	67	32.84	69	33.82	136	33.33
Making wall by other than mud	33	16.18	46	22.55	79	19.36
Raising bank of pond	41	20.10	37	18.14	78	19.11
Enclosing bank of pond by net	37	18.14	26	12.75	63	15.44
Cultivating flood-tolerant crops	30	14.70	28	13.73	58	14.22
Others (Saving money, teaching the children how to swim)	15	7.35	25	12.25	40	9.80

However, the people of the study area also raised the floor of their housesas per the opinion of more than half of the respondents (55.39 percent), so that they could stay at their housesafter submerging of their homestead. They also preserved seed in safe place in order to start agricultural work after flood. Some of them (19.36 percent) reported that they made the wall of their houses with some materials other than mud, that is, bamboo, wood and CI sheet as the walls made of earth break down during flood quickly. One of the respondents stated:

> *"The roof of my house was built with bamboo, wood and CI sheet before last flood. But thewall was made of mud. When the courtyard of my house was submerged, the earthen wall of the house became water-soaked and weak. After 2/3 days,lower parts of the wall and floor of my house were submerged because of increasing water level. Then the wall collapsed. I had to take shelter at a neighbor's house. After that I made the wall of my house with wood and CI sheet so that it would not collapse during flood,"*(Mojibor, 45-year-old farmer of *Chinaduli*).

Moreover, some others (33.33 percent) moved their houses to upper place before flood. It is also found that the respondents preserved cattle food (35.29 percent) as lack of fodder became acute during previous floods.They raisedthe bank of the pond (19.11 percent) and put net enclosure (15.44 percent) for protecting fish.They cultivated flood-tolerant crops (14.27 percent) so that sudden and short-term flood could not damage the growing crops. However, they also took other measures as reported by a few of the respondents (9.80 percent) such as saving money, teaching the children how to swim etc. (Table 6.24).

6.4.1 Roles Performed by Women in Pre-Disaster Phase

It appears that women participated in various types of activities along with men in pre-disaster (pre-flood) stage for better preparedness. But a little variation was found between the opinions of men and women regarding women's rolein preparedness phase According to three-quarters of the male respondents (75.00 percent), compared to 61.27 percent female respondents,women played important role in preserving food in advance for consuming during flood. Like in the normal period, women naturally remain engaged in preparing and distributing food during emergency period along with doing other jobs. Sometimes, they are given additional responsibility to procure food, especially at crisis moment. Therefore, they preserve food for crisis period with utmost importance.

Table 6.25: Distribution of Roles Performed by Women in Preparedness

*Preparedness Mechanism	Male (n=204)		Female (n=204)		Total (n=408)	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Preserving fuel	123	60.29	183	89.71	306	75.00
Preserving food for crisis period	153	75.00	125	61.27	278	68.14
Raising plinth of the homestead	105	51.47	156	76.47	261	63.97
Raising floor of the house	129	63.24	127	62.25	256	62.75
Preserving fodder	55	26.96	62	30.39	117	28.68
Preserving seed in safe place	47	23.04	43	21.08	90	22.06
Raising bank of the pond	11	5.39	7	3.43	18	4.41
Surround pond by net	8	3.92	8	3.92	16	3.92
Others (assisting males in various works, making moveable ovens)	3	1.47	7	3.43	10	2.45

However,a large number of the women (89.71 percent) compared to 60.29 percent of men, opined that they preserved fuel for the crisis period as fuel shortage became acute during previous floods and they had to face this problem severely. However, more than three-quarters of the women (76.47 percent) were found to perform their role in raising the plinth of homestead. More than half of the men (51.47 percent) acknowledged the role of women in this sector. About two-thirds of the respondents (62.75 percent) replied that women had valuable contribution to raise the floor of the house. Women also performed other jobs such as they preserved seed, raised the bank of the pondand surrounded pond with net as reported by 22.06, 28.68, 4.41 and 3.92 percent respondents respectively. They also assisted their male counterparts in other works, e.g. they helped their male counterparts in moving the house to upper place (Table 6.25).

The above findings show that women played a pivotal role, as men did, in preparedness phase along with doing their daily household chores. Moreover, many women were also found to perform additional roles that were related to their gender-specific roles, e.g. preparing dry food, dung-cakes, making moveable ovens etc. that is reflected the following statement:

> *"I participated in various types work for taking preparation in advance to combat floods. I assisted my husband to raise plinth of the house. I also preserved some dry foods for us and fodder for my cows and goats. I did some additional jobs such as preserving fuel, making moveable oven etc. that were not done by my husband,"* Rahima (a 50-year-old housewife of *Chinaduli*).

6.4.2 Decision-making in Preparedness Phase at Household Level

The previous sections show that people of the study area, both men and women,performed various roles for better preparedness. But who took the decision regarding doing these works? Did women could make any decision independently since most of the women of Bangladesh, especially those in rural area; have little opportunity to exercise power and authority in decision-making process at intra-household, economic and political arenas (Karim2011; Shekh, 2003). Although they have little power to make decision alone, their participation was found in decision-making process at preparedness phase in the study villages. It is found that more than half of the men (about 52 percent), compared to 46.57 percent women took their preparedness decisions jointly (husband-wife). On the other hand, slightly less than half of the women (about 48

percent),compared to 30.88 percent men, reported that all family members took their decisions together for preparedness which indicates that at least women had participation in deliberation at household level. On the other hand, information given by 10.78 percent respondents (16.67 percent men, compared to 4.90 percent women), the researcher confirmed that husband (male member of the family) made the preparedness decision alone.In contrast, only 0.74 percent of respondents reported that women took their preparedness decisionalone (Table 6.26) that indicates women's minimum authority to make decision.

Table 6.26: Distribution of Responses on Decision-making in Preparedness Phase

Decision-maker in Preparedness Phase	Male		Female		Total	
	Number	Percent	Number	Percent	Number	Percent
Husband alone	34	16.67	10	4.90	44	10.74
Wife alone	1	0.49	2	0.98	3	0.74
Husband-wife jointly	106	51.96	95	46.57	201	49.26
Family members jointly	63	30.88	97	47.55	160	39.22
Total	204	100	204	100	408	100

However, the respondents, who said that husbands took preparedness decision alone, were asked whywomen's opinion was not sought in the decision-making process. In response to this question most of the men (32 out of 34) replied that men can take appropriate decision in any situation. Therefore, they did not seek women's opinion in the decision-making process. However, they also believed that women were not able to make decision;rather they depended on men's decision. So, how would they (women) contribute to making decisions? In contrast,female respondents replied that men would not like to lose their authority and control over women that is why they did not seek women's opinion in decision-making process.

6.5 Summary and Conclusion

The main purpose of this chapter is to get a clear picture of the preparedness strategies adopted by GAs and NGOs as well as by individuals at household level. It is found that GAs, especially the UP, have played a vital role in preparedness phase. It built *kancha* roads both in *Ajogara* and *Chinaduli* that were also used as flood control dam to prevent normal flood. The UP also built sluice gates (in *Chinaduli*) that were used to pass the rain

water, that is why water logging and early flood was not created in the area located inside the road, despite incessant and torrential rain. The UP also repaired infrastructure before the last flood. But the role of the NGOs and people of the community in this sector was found to be very nominal. However, GAs and NGOs also provided the villagers with training on various issues to enhance their capacity, skill and knowledge base. But participation of both men and women in training programs was found inadequate. But higher participation of men was found in awareness-building programs compared to women. Only one-quarter of the women took part in awareness-building programs while the percentage of men was 58.70. The number of women who participated in awareness-building program was significantly less than that of men.

However, practice of *purdah,* religious restriction and gender ideology acted as barrier to women's participation in training and awareness-building program. Traditional gendered roles sometimes created overburden for women in preparedness phase as they had to perform these additional roles along with doing other regular jobs. For instance, they had to preserve fuel anddry food; make moveable ovens, assist men in raising plinth of their homestead and floor of the dwelling house,along with doing other regular household chores. Despite playing pivotal roles in preparedness phase, women had minimum power to make decision alone although they had participation in most of the cases. Therefore, it might be said that they were not merely follower of men's decision. However, the above discussion shows that GAs, NGOs and individuals at household level adopted various types of structural and non-structural measures as preparedness to combat flood. But to what extent was the study area disaster-resilient and the people were able to combat flood-induced disaster? The next chapter will deal with this issue.

Chapter VII
Response to Flood: Coping Strategies of the Affected People and Services Provided by GAs and NGOs

7.1 Introduction

The main focus of this chapter is to analyze the mode of daily life during flood and nature of response to flood of the affected people; and contribution of GAs and NGOsin assisting them in coping with flooding. Disaster response, in general, covers the indispensable services and activities that are initiated during the initial impact or in the immediate aftermath of a disaster to save lives and to prevent further damage to property (Bhatti, 2003:59; Kreps et al. 2006:20; Kapucu, 2008:244). On the other hand, coping strategies include the combination of activities and choices that households opt for in order to survive (Blaikie et al., 1994 cited in Palmino-Raganit, 2005). However, previous studies (Begum, 1995; BCAS, 2010; Juthi, 2003; Nino, Smith and Roy, 2004) related to natural disasters showed that people of the flood-affected area had to suffer from various types of problems during flood. But what did happen to the study area? What was the real feature related to daily life of the affected people? To seek the answer to these questions, the present study has investigated the daily living style of and problems faced by the affected people during flood, and the means of absorbing the situation and coping with it. Accordingly, this chapter presents the responses of the respondents to the above queries. More specifically, it narrates the problems experienced by flood victims; highlights thenature of assistanceoffered by neighborsand relatives; coping mechanismsof local people at household level and nature of assistance offered by GAs and NGOs. Finally, it sheds light on the state of resiliency of the study area on the basis of absorbing and coping capacity of the local people. Nonetheless, the discussion of this chapter is based on primary data collected by employing interview, FGD and observation methods. Data collected from key informants (KIs) have alsobeen analyzed here for getting a distinct understanding about coping strategies of the affected people and contribution of GAs and NGOs.

7.2 Problems Faced by People during Flood

Flood creates adverse effects on affected community. Flood-affected people have to face multiple problems during flood. Data show thatthe situation of the study villages was no

exception. The people of the study area were found to face various kinds of problems during flood. The highest number of the respondents (93.87 percent) was found to suffer from food shortage during flood followed by illness (89.71 percent). The major portion of the respondents (86.27 percent) was also found to be facing serious problem moving from here to there as the roads and paths are inundated during flood (Table 7.1).

Table 7.1: Distribution of Problems Faced by People during Floods by Sex and Village

Problems faced by people during flood	Male		Female		Total (n=408)
	Ajogara (n=102)	Chinaduli (n=102)	Ajogara (n=102)	Chinaduli (n=102)	
Food shortage/crisis	100 (98.04)	91 (89.22)	101 (99.02)	91 (89.22)	383 (93.87)
Illness	97 (95.10)	90 (88.24)	93 (91.18)	86 (84.31)	366 (89.71)
Problem of movement	95 (93.14)	68 (66.67)	98 (96.08)	91 (89.27)	352 (86.27)
Scarcity of fuel	96 (94.12)	24 (23.53)	98 (96.08)	93 (91.18)	311 (76.23)
Problem of defecation	97 (95.10)	45 (44.12)	96 (94.12)	53 (51.96)	291 (71.32)
Menace of mosquito	94 (92.16)	5 (4.90)	93 (91.18)	80 (78.43)	272 (66.67)
Fear of snake biting	87 (85.29)	7 (6.86)	86 (84.31)	88 (86.27)	268 (65.69)
Scarcity of drinking water	87 (85.29)	21 (20.59)	84 (82.35)	92 (90.20)	265 (64.95)
Problem of keeping livestock	84 (82.35)	15 (14.71)	70 (68.63)	76 (74.51)	245 (60.05)
Fear of drowning	77 (75.49)	9 (8.82)	77 (75.49)	59 (57.83)	222 (54.41)
Lack of employment	92 (90.20)	16 (15.69)	90 (88.24)	16 (15.69)	214 (52.45)
Scarcity of baby food	84 (82.35)	13 (12.75)	84 (82.35)	25 (24.51)	206 (50.49)
Absence in school	81 (79.41)	26 (25.49)	80 (78.43)	19 (18.63)	206 (50.49)
Lack of shelter	85 (83.33)	10 (9.81)	83 (81.37)	24 (23.53)	202 (49.51)
Environment pollution	72 (70.59)	22 (21.57)	70 (68.63)	29 (28.43)	193 (47.30)
Destruction of crops	42 (41.18)	55 (53.92)	20 (19.61)	57 (55.88)	174 (42.65)
Absence in work	70 (68.63)	16 (15.69)	61 (59.80)	24 (23.53)	171 (41.91)
Scarcity of cattle food	71 (69.61)	17 (16.67)	68 (66.67)	11 (10.78)	167 (40.93)
Increase in stealing	68 (66.67)	5 (4.90)	68 (66.67)	9 (8.82)	150 (36.76)
Loss of fish	26 (25.49)	10 (9.81)	23 (22.55)	10 (9.81)	69 (16.91)

*More than one answer has been accepted. Figures within parenthesis show the percentage.

Table 7.1 further reveals that more than three-quarters of the sample households (76.23 percent) suffered from cooking food due to fuel crisis. The respondents reported that their dry fuels got wet and they could not dry them due to incessant rain. This problem changed the eating behavior of the people in the study area. However, a large number of the respondents (72.32 percent) reported that they faced acute problem in defecating as

their latrines were either damaged or become unusable because of submerging or for being washed away by flood water. On the other hand, two-thirds of the respondents (66.67 percent) replied that they faced menace of mosquito. Mosquitoes increased during flood as congenial environment was created for its larva. However, psychological problems such as fear of snake-biting (65.69 percent) and fear of drowning (54.41 percent) were created among the villagers, especially among the women. However, the study also finds that about two-thirds of the respondents (64.95 percent) suffered from scarcity of pure drinking water as most of the tube-wells were inundated. They also faced problem keeping their livestock as the homestead and surroundings of their house were submerged (60.05 percent).

However, more than half of the respondents (52.45 percents) reported that they suffered from employment scarcity both in agricultural and non-agricultural sectors. On the other hand, absenteeism in school (50.49 percent) and workplace (41.91 percent) was created in the study area. The guardians of the school-going children reported that their children could not attend school during flood due to problem in movement and fear of drowning. They also could not read at home due to absence of congenial atmosphere. Sometimes flood water even washes away their books and reading materials that leave negative consequences on them.

About half of the respondents (49.51 percent) said that they faced lack of safe shelter during flood as their houses were submerged, broke down or were washed away by flood water. Some of them also reported that tendency of stealing was also increased in their locality (36.76 percent), *Ajogara* in particular (66.67 percent). It should be noted that although both men and women reported that they faced various kinds of problems, the number ofrespondentswas varied from village to village. For example, more people of Ajogara were found to face the problem of stealing, scarcity of cattle-food, lack of shelter, lack of employment etc. than that of *Chinaduli* (Table 7.1).

7.3 Rescuing Marooned People from Disastrous Situation

Data collected through Focus Group Discussions (FGDs) with men and women, interview with key informants and direct observation show that the study villages, both *Ajogara* and *Chinaduli*,are seriously vulnerable to various types of flood, barring storm-surge flood, due to their geographical location. The study villages are very often submerged by flash

flood or monsoon flood. The residents of this area become marooned within very short time due to sudden flood. As a result, rescue operation becomesa matter of utmost necessity for salvaging the flood victims in order to save their lives and properties. Consequently, the respondents were asked whether anybody came to rescue them from danger during catastrophic flood. In response to the question, most of the respondents (84.80 percent) provided affirmative answer (Table 7.2). The findings indicate that response phase was started with efforts to save lives and properties of the affected people that complies with the findings of study of Paul and Routray (2010), Rashid and Paul(1987), and Thomson and Tod (1998).

Table 7.2: Distribution of Opinion about RescuingMarooned People

Anybody came to rescue	Male			Female			Grand Total
	Ajogara	Chinaduli	Total	Ajogara	Chinaduli	Total	
Yes	76 (74.51)	99 (97.06)	175 (85.78)	72 (70.59)	99 (97.06)	171 (83.82)	346 (84.80)
No	26 (25.49)	3 (2.94)	29 (14.22)	30 (29.41)	3 (2.94)	33 (16.18)	62 (15.20)
Total	102 (100)	102 (100)	204 (100)	102 (100)	102 (100)	204 (100)	408 (100)

Percentage has been shown in parenthesis.

Traditionally, the rural people ofBangladesh are sympathetic and bear cooperative attitude. They help each other in disasters as well as in dangers and difficulties. Data show that the study area was not different in this regard. Neighbors, relatives, and rescue operation team of GAs and NGOs came to rescue the unfortunate people from catastrophic situation evolved due to flood. But who did come first to rescue them?

Table 7.3: Distribution of Responses about Rescuers by Sex

Rescuers	**Male (n=175)**		**Female (n=171)**		**Total (n=346)**	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Neighbors	119	68.00	137	80.12	256	73.99
Relatives	142	81.14	95	55.56	237	68.50
Local Govt. (UP)	28	16.00	23	13.45	51	14.74
NGOs	11	6.29	13	7.60	24	6.94

The interviews with the selected samples revealed that in most of the cases neighbors came first to rescue them as mentioned by about three-quarters of the respondents (73.99 percent), of whom 80.12 percent are women, compared to 68 percent men. On the other hand, more than two-thirds of the respondents (68.50 percent) opined that relatives came first to rescue them from danger during flood, of whom 81.14 percent were men, compared to 55.56 percent women (Table 7.3). It should be noted that more than one answer to the above questionwas possible. In addition, a person might be simultaneously relative and neighbor of another person, that is why it is difficult to articulate whose contribution was more than others and who came first to rescue the victims. One of the respondents' comment might be pertinent here, who explained the situation in the following way:

> *"It is difficult to say who come first to rescue from danger during flood. It depends upon the location of relatives or neighbors. If my relative lives near me then he/she is also my neighbor and no doubt he/she will come first to rescue me. If I have no relation near me then the neighbors will rescue me first,"* Faijul (a 43-year-old farmer of *Ajogara*).

One of thefemale respondents of *Ajogara* stated:

"Neighbors come first to rescue flood victims. Because at first they come to know that their neighbors have fallen into risk before the relatives. Therefore, neighbors come first to rescue from danger,"Jarina (a 35-year-old housewife).

It appeared from focus group interviews with local people and from interviews with KIs that local administration (UP) and NGOs also operated rescue operations. But the number of rescue services received by flood-affected people from neighbors and relatives was greater than that of the local administration and NGOs (Table 7.3).

7.4 Cooperation of Neighbors during Emergency

People of Bangladesh use their indigenous knowledge, methods and strategy to cope with disaster for a long time. They try to combat disastrous situation with the help of their own resources, knowledge and experiences.Basically, people of the community are the first victims of any hazard and they respond first to that hazard (Ritchie, 2003:102) and they help each other to combat the crisis (Islam, 2008:45).The people of the flood affected area offer their assistance to each other to cope with catastrophic situation that is the excellent

instance of community feeling (Hossain, 2012).However, the interviews with respondents revealed that people of the study area also extended their cooperation with each other to cope with disastrous situation with some exceptions. Majority of the respondents (62.75 percent) mentioned that their neighbors provided them with various kinds of supports so that they could survive during flood. The respondents also helped their neighbors. It was the mutual cooperation between each other. On the other hand, more than one-third of the respondents (37.25 percent) stated that they did not get any support from their neighbors (Table 7.4).

Table 7.4: Opinion about Cooperation Offered by Neighbors during Flood

Types of Opinion	Male		Female		Total	
	Number	Percent	Number	Percent	Number	Percent
Yes	119	58.33	137	67.16	256	62.75
No	85	41.67	67	32.84	152	37.25
Total	**204**	**100**	**204**	**100**	**408**	**100**

7.4.1 Types of Supports Offered by Neighbors during Emergency

The previous section shows that the majority of the respondents received supports from their neighbors. The response of the neighbors aimed at helping the victims survive the flood. The neighbors assisted the victims in different ways during flood such as providing shelter; supplying food, drinking water, and medicine; preserving valuable goods, providing information and transportation facilities; taking victims away to safe place, and looking after the children and elderly as their social responsibility (Table 7.5).

The majority of the respondents (86.72 percent) reported that their neighbors provided the flood-affected people with shelter supports who could not stay at their houses due to inundation. Data indicate that a little less than two-thirds of the respondents (62.89 percent), of whom 72.26 percent women, compared to 52.10 percent men, received food items from their neighbors. They also received supports from their neighbors to preserve their valuable goods such as paddy, rice, and other crops as per opinion of about one-third of the respondents (31.25 percent).

Table 7.5: Distribution of Supports Offered by Neighbors during Flood

Types of Services	Male (n=119)		Female (n=137)		Total (n=256)	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Providing shelter	99	83.19	123	89.78	222	86.72
Supplying food	62	52.10	99	72.26	161	62.89
Preserving valuable goods	12	10.08	68	49.64	80	31.25
Taking to safe places	32	26.89	45	32.85	77	30.08
Supplying drinking water	26	21.85	35	25.55	61	23.83
Supplying medicine	30	25.21	24	17.52	54	21.09
Looking after the children	29	24.37	22	16.06	51	19.92
Providing transportation	23	19.33	22	16.06	45	17.58
Providing information	30	25.21	13	9.49	43	16.80
Looking after the elderly	19	15.97	7	5.11	26	10.16
Protecting crops	17	14.29	9	6.57	26	10.16
Protecting fish of ponds	7	5.88	3	2.19	10	3.91

However, the neighbors were found to supply drinking water (23.83 percent) and medicine (21.09 percent) that was crying need to cope with the situation immediately. Some of the respondents opined that theneighbors also provided them with necessary information related to weather and flood forecast, safe places, relief and other services and transportation facilities. In addition, they helped each other by taking care of children and elderly people, protecting crops (by harvesting), and fish of the pond. The findings indicate that the social bondage and fellow feelings still exist in rural Bangladesh although the altruistic attitude is on the wane gradually that has been discussed in the following section.

7.4.2 Reasons for Non-cooperation of Neighbors

It is found earlier that a significant number of the respondents (37.25 percent) did not get any assistance from their neighbors during flood. As per opinion of the respondents,the neighbors neither came to rescue them nor provided them with any supports. Consequently, a question was placed before them about the reasons for non-cooperation of the neighbors.Majority of the respondents (88.16 percent), who did not receive any supports from their neighbors, said in response to this questionthat the neighbors also

remained in danger during flood; therefore, they could not come forward to rescue them and provide other supports. However, poverty was found as another reason for non-cooperation by the respondents. About 31.00 percent of the respondents reported that because of abject poverty, most of the neighbors could not fulfill their basic needs during floods. Then how would they offer supports to others. Socioeconomic background information indicates that really they were not a position to offer food, medicine or shelter because of their economic hardship. In addition, a few of the respondents mentioned in a disappointing tone that because of loosing social bondage (9.21 percent) and decline in beneficial attitude (8.55 percent), the neighbors' cooperation is rare now (Table 7.6).

Table 7.6: Distribution of Reasonsfor Non-cooperation of Neighbors

Reasons for non-cooperation	Male (n=85)		Female (n=67)		Total (n=152)	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Neighbors remain at risk	68	80.00	66	98.51	134	88.16
Poverty	24	28.24	23	34.33	47	30.92
Loosing social bondage	12	14.12	2	2.99	14	9.21
Declining beneficial attitude	4	4.17	9	13.43	13	8.55

Comment of one of the respondents(Malek, a 50-year-old farmer of *Ajogara*)is remarkable here that presents the whole situation of the study area. He states:

> *"The neighbors also remained in danger during floods. They were busy protecting their own lives and valuable goods from the catastrophe. So they could not think about others' matter. Besides this, the social bondages among the villagers and feelings for each other have become weaker than before. Nobody now thinks deeply for others. The matter is like 'self-preservation is one's foremost duty.' Therefore, neighbors' assistance is not remarkable now."*

Golam (a 45-year-old rickshaw-puller of *Chinaduli*) replies in the following way with regard to non-cooperation of the neighbors:

> *"When floods start, dwelling houses and surroundings are submerged very rapidly. The people become puzzled. All of them become very busy to protect their own valuable assets and resources. They look for safe place. So it is very*

difficult to think for others during that time. Moreover, most of the people of our locality live under poverty line. Therefore, in spite of having good wishes to help others they could not provide their neighbors with financial and other support services."

Hamida (a 39-year-old housewife of *Ajogara*) replied:

"I had to manage all things from taking clothes and cooking utensils to poultry and livestock during leaving house for safe place. So it was not possible for me to help others."

7.5 Services Provided by the Union *Parishad* during Floods

The Union *Parishad* (UP), as one of the organs of local government, has been given some duties and responsibilities to solve the local problems and development of the local area. Some roles have also been assigned to the UP to assess the needs and provide services to the disaster victims. The UP does this job through the Union Disaster Management Committee in association with other government agencies such as Department of Public Health Engineering, Ministry of Health and Family Welfare etc. The respondents were asked whether they got services from the UP during last flood. Although more than half of the respondents (55.39 percent) replied in the positive, the responses varied by places and sex (Table 7.7).

Table 7.7: Distribution of Opinion on Services Provided by the UP by Sex and Village

Types of opinion	Male			Female			Grand Total
	Ajogara	Chinaduli	Total	Ajogara	Chinaduli	Total	
Yes	33 (32.35)	88 (86.27)	121 (59.31)	23 (22.55)	82 (80.39)	105 (51.47)	226 (55.39)
No	69 (67.65)	14 (13.73)	83 (40.69)	79 (77.45)	20 (19.61)	99 (48.53)	182 (44.61)
Total	102 (100)	102 (100)	204 (100)	102 (100)	102 (100)	204 (100)	408 (100)

Percentage has been shown in parenthesis.

Table 7.7 shows that about two-thirdsof male (67.65 percent) and more than three-quartersof female (77.45 percent) respondents of *Ajogara* did not get any service provided by the UP during last flood. Only one-third of the (32.35 percent) male and less than one-quarter (22.55 percent) of the female respondents were found to have received services provided by the UP during flood.In contrast, the largest number of respondents

(male 86.27 percent and female 80.39 percent) of *Chinaduli*was found to have received various types of services provided by the UP during last flood. Only a few of them (male 13.73 percent and female 19.61 percent) were unfortunate who did not get services of the UP.

Table 7.8: Types of Services Provided by the UP during Flood

Types of services	Male (n=121)		Female (n=105)		Total (n=226)	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Providing information	69	57.02	73	69.52	142	62.83
Supplying medicine	55	45.45	60	57.14	115	50.88
Supplying food grains	77	63.63	32	30.48	109	48.23
Assisting in taking shelter	12	9.92	53	50.48	65	28.76
Providing transportation	14	11.57	38	36.19	52	23.01
Arranging shelter	15	12.40	14	14.33	29	12.83
Supplying cooked food	13	10.74	7	6.67	20	8.85
Supplying water purifying tab.	12	9.92	6	5.71	18	7.96
Supplying pure drinking water	8	6.61	7	6.67	15	6.64

The respondents, who said that the UP provided them with services during last flood, were asked aboutthe types of services. As per the opinion of about two-thirds of the respondents (62.83 percent), the UP aimed at helping the people ensure access to necessary information (Table 7.8). The UP was found to provide necessary information among the people related to hygiene, health and other services. Data further show that half of respondents (50.88 percent) received medicine for their treatment. Slightly less than half of them (48.23 percent) received food grains as test relief during flood. On the other hand, more than one-quarter (28.76 percent) of the respondents got assistance from the UP to take shelter in safe place. Among other services provided by the UP were transportation (23.01 percent), arranging shelter (12.13 percent); andsupplying cooked food (8.85 percent), water purifying tablet (7.96 percent) and pure drinking water (6.64 percent).

7.6 Services Provided by NGOs during Flood

Like GAs, NGOs are also involved in response phase of disaster management. They provide various types of services among the flood victims during flood so that they could cope with the situation. Out of the total respondents, two-thirds (66.18 percent)

acknowledged the fact that they received various types of services provided by the NGOs. However, the large majority of the respondentsof *Chinaduli,* both male (74.51 percent) and female (78.43 percent) and about two-thirds of male (63.73 percent) of *Ajogara*were found to have received various types of services of NGOs during last flood. But more than half of the female respondents of *Ajogara*(51.96 percent) alleged that they did not get any services from NGOs during flood (Table 7.9).

Table 7.9: Distribution of Responses about Whether Services Provided by NGOs

Types of answer	Male			Female			Total
	Ajogara	Chinaduli	Total	Ajogara	Chinaduli	Total	
Yes	65 (63.73)	76 (74.51)	141 (69.12)	49 (48.04)	80 (78.43)	129 (63.24)	270 (66.18)
No	37 (36.27)	26 (25.49)	63 (30.88)	53 (51.96)	22 (21.57)	75 (36.76)	138 (33.82)
Total	102 (100)	102 (100)	204 (100)	102 (100)	102 (100)	204 (100)	408 (100)

However,about three-quarters of the respondents (73.70 percent) were found to have received medicine during flood as NGO support for their treatment. The number of women beneficiaries (82.17 percent) was found to be higher than that of men (65.96 percent) in receiving medicine. It was significantly beneficial for women as they got it at their doorstep during flood. However, more than half of the respondents (52.22 percent) were found to have received food grains from NGOs as test relief, of whom 59.57 percent were men, compared to 44.19 percent women (Table 7.10).

Table 7.10: Distribution of Types of Services Provided by NGOs during Flood

Types of services	Male (n=141)		Female (n=129)		Total (n=270)	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Supplying medicine	93	65.96	106	82.17	199	73.70
Supplying food grain	84	59.57	57	44.19	141	52.22
Providing information	19	13.48	38	29.46	57	21.11
Supplying drinking water	18	12.78	21	16.28	39	14.44
Assi. in going to safe place	19	13.48	14	10.85	33	12.32
Arranging shelter	15	10.64	10	7.75	25	9.26
Providing transportation	11	7.80	12	9.30	23	8.52
Supplying cooked food	15	10.64	8	6.20	23	8.52
Others (water purify tab.)	8	5.67	7	5.43	15	5.55

It should be mentioned that as members of a patriarchal society, women's movement is limited compared to men in rural Bangladesh. In most of the cases, they are not allowed to go outside the home for receiving relief, thus, their number might be less than that of men. However, among other remarkable services provided by NGOs were provide necessary information, supplying pure drinking water, assistance in going to safe place,arrange shelter for shelterless people, provide transportation facilities, supplying cooked food and water purifying tablets (Table 7.10).

7.7 Indigenous Coping Strategies of the Respondents at Household Level

Coping strategies are the range and combination of activities and choices that households choose for survival in any crisis (Blaikie et al. 1994 cited in Palmino-Raganit, 2005). These strategic options may include short-term considerations such as ways of earning a living, coping with shocks and managing risks (Aasoglenang and Boney, 2013). The flood-affected people in the study area adopted a range of mechanisms to cope with flood. About two-thirds of the respondents (65.20 percent) were found to take various strategies to make the houses habitable. They repaired houses during flood. They also raised the bed so that they could stay at their homestead and keep their goods on that bed. However, slightly less than two-thirds of the respondents (62.25 percent) were found to take various strategies to ensure availability of dry fuel so that despite the existing difficulties they could cook food. It is important to mention that the number of women (80.39 percent) was found to be higher than that of men (44.12 percent) to manage dry fuel. A significant number of the respondents (60.05 percent) were found to collect pure drinking water from distance to fulfill the household demand of drinking wateras their tube-wells became unusable due to flood. Like managing dry fuel, more women (75.98 percent) than men (44.12 percent) were found to be involved in collecting water.

However, more than half (55.15 percent) of the respondents were found to purify water by boiling and more than one-third (38.97 percent) by using water purifying tablets for household consumption as most of sources of pure drinking water became unusable. Actually, it was not possible for them, even if they wanted to collect water from distant places because of violent weather. Therefore, they had to purify water along with collecting from distant areas. However, changing eating behavior was found as one of the strategies to cope with flood. More than half of the respondents (52.21 percent) were found to eat sub-standard food items in order to cope with food crisis. Even a significant

number of them (45.10 percent) were found to reduce the number of meal from three to two per day. Nonetheless, a great concern about drowning was there during floods among the parents of minor children. Thus they had to pay due attention to the children. The study area was no exception in this regard. A significant portion of the respondents (42.40 percent) reported that they paid more attention to their children so that none of the children drowned (Table 7.11).

Table 7.11: Distribution of Strategies Adopted by Respondents in Coping with Floods

Coping strategies adopted by people during flood	Male (n=204)		Female (n=204)		Total (n=408)	
	F	P	F	P	F	P
Making house habitable	141	69.12	125	61.27	266	65.20
Collecting dry fuel	90	44.12	164	80.39	254	62.25
Collecting water from distance	90	44.12	155	75.98	245	60.05
Purifying water by boiling	102	50.00	123	60.29	225	55.15
Eating sub-standard food	70	34.31	143	70.10	213	52.21
Reducing amount of food	93	45.59	91	44.61	184	45.10
Paying attention to children	75	36.76	98	48.04	173	42.40
Purifying water by tablet	58	28.43	101	49.51	159	38.97
Borrowing	84	41.18	74	36.27	158	38.73
Using non-hygienic toilet	56	27.45	96	47.06	152	37.75
Keeping Awake & watching	66	32.35	82	40.20	148	36.27
Searching for alternative work	65	31.86	67	32.84	132	32.35
Taking shelter in safe place	63	30.88	55	26.96	118	28.92
Receiving relief	61	29.90	55	26.96	116	28.43
Using boat for movement	75	36.76	27	13.24	102	25.00
Using alternative baby-food	26	12.75	36	18.63	62	15.20
Others (selling valuable goods)	22	10.78	26	12.75	48	11.76)

N.B. F= Frequency, P= Percent

A significant portion of the respondents (38.73 percent) were found to borrow food items or money from non-institutional sources such as relatives or neighbors to meet the food shortage or other needs. Sometimes,they were compelled to borrow money from money lenders with high interest that further threw them into economic vulnerability. However, defecation became acute problem in the study area during flood as most of the toilets

were either washed away or submerged. The respondents were found to use non-hygienic defecation system (37.25percent). They made temporary (hanging or pit) toilet for the emergency period. Some of them, especially men, used to go to distant areas by boat to defecate. They generally defecate on water from boat that creates water pollution.Other measures adopted by the respondents were: remaining awake at nigh and watching jointly (36.37 percent), searchingfor alternative works for earning money (32.25 percent), receiving relief for mitigating food crisis (28.43 percent), taking shelter in safe places (28.92 percent),using boat or raft (made of banana trees) for movement (25.00 percent), using alternative baby food (15.20cpercent), and selling out valuable goods (11.76 percent).

7.7.1 Factors Influencing Coping Strategies

Non-parametric correlation measures were applied to explore the relationship between some independent variables and coping strategies adopted by the respondents. Household income and landownership as well as educational attainment and sex of the respondents were found to be associated with adopting some strategies to cope with deluge.

Household Income and Coping Strategy

Household income is the conglomerate indicator that reflects assets, occupation, savings etc. thus, it is assumed to have an influence on response of an individual to the act of coping with disasters (Haque, 1997 cited in Paul & Routray 2011). Households with higher income, who live above poverty line, help themselves in a flood event (Green et al. 1994) and could take necessary measures to combat the situation. They do not have to depend on others' assistance. On the other hand, poor people have to depend on external aid and cooperation of other stakeholders (Table 7.12).

However, borrowing was found significantly associated with household status based on monthly income, χ^2 (2, N=408) =13.852, p. =.001,φ_c =.185). Flood affected small-income households (44.44 percent) were found in greater number than middle-income (37.77 percent) and high-income households (19.67 percent) borrowing during flood to cope with the situation. On the other hand, ability to use alternative baby-food was found greater among the high-income households (27.87 percent) than middle-income (12.99 percent) and small-income households (13.70 percent), χ^2 (2, N=408) = 8.072, p=.018,φ_c=.141).

Table 7.12: Relationship between Household Income and Coping Strategies

Coping strategies	Household Categories*			Pearson Chi-square	Sig. value	Cramer's V
	Small income (%)	Middle income (%)	High income (%)			
Borrowing	44.44	33.77	19.67	13.852	.001	.184
Receiving relief	27.78	32.67	26.23	.0.818	.664	.045
Coll. water from distance	62.96	54.55	54.10	2.828	.243	.083
Purify water by tablet	36.30	41.59	47.54	2.913	.233	.084
Purify water by boiling	51.48	58.44	67.21	5.395	.067	.115
Eating sub-standard food	55.19	49.35	42.62	3.457	.178	.092
Reducing No. of meal	45.19	46.75	42.62	.237	.888	.024
Searching alternative job	32.96	32.47	29.51	.272	.873	.026
Using alternative baby food	13.70	12.99	27.87	8.072	.018	.141
Watching at night	39.26	36.36	22.95	5.725	0.57	.118

* Small income household (yearly income up to BDT 4,000, n=270), Middle income household (yearly income BDT 4,001-6,000, n=77), High income household (yearly income more than BDT 6,000, n=61), Total (n=408), df. 2.

Other strategies, such as collecting water from distant sources, eating sub-standard food items, reducing number of meal were also found higher among the small-income households than among middle- and high-income households, although that were not significant. On the other hand, purifying water by using tablet and boiling were positively (but not significant) associated with incomes of the households.Purifying water by using tablets and boiling werefound higher among thehigh-income households than among middle and small-income households(Table 7.12).

Landownership and Coping Strategy

More than one-third households of the respondents (40.44 percent) were found completely landless. They had no land at all to make a dwelling house. They lived at others' homesteads. In addition, the households owning up to .50 acre of land, were also considered as landless as per rules of micro-credit disbursement since they had to depend upon non-farm activities for their livelihoods.

Table 7.13: Relationship between Household Landownership and Coping Strategies

Coping strategies	Household Categories*			Pearson Chi-square	Sig. value	Cramer's V
	Landless (%)	Small farm (%)	Large farm (%)			
Borrowing	43.43	21.82	15.38	15.639	.000	.196
Receiving relief	29.66	25.45	19.23	1.565	.457	.062
Coll. water from distance	60.68	54.55	61.54	.807	.668	.044
Purifying water by tablets	37.61	40.00	53.85	2.696	.260	.081
Purifying water by boiling	54.74	50.91	69.23	2.506	.286	.078
Eating sub-standard food	55.66	38.18	38.46	7.865	.020	.139
Reducing No. of meal	47.09	34.55	42.31	3.082	.214	.087
Searching for alternative job	35.74	16.36	26.93	8.230	.016	.142
Using alternative baby food	14.68	16.36	26.72	2.752	.253	.082
Watching at night	37.92	30.91	26.92	2.052	.358	.071

*Landless (up to 0.50 acre of land, n=327), Small farm (0.51-2.00 acre of land, n=55), Large farm (More than 2.00 acre of land, n=26), Total (n=408), df. 2.

However, previous studies (Haque, 1997; Paul & Routray, 2011) revealed that landless households were vulnerable to disaster. Therefore, they were compelled to borrow money or materials for their survival during emergency. The present studyalso finds similar relationship between borrowing and landlessness, that is,borrowing was positively and significantly associated with landlessness, $\chi^2(2, N=408) = 15.639$, $p<.001$, $\varphi_{c=}.196$. The number of landless households (43.43 percent) was found higher than small farm (21.82 percent) and large farm (15.38 percent) households in borrowing during floods. In addition, eating sub-standard food was positively and significantly associated with landlessness,$\chi^2(2, N=408) = 7.865$, $p=020$, $\varphi_{c=}.139$. Eating sub-standard food was found higher among the landless households (55.66 percent) than among small farm (38.18 percent) and large farm (38.46 percent) households. Moreover, searching for alternative work was also found higher among the landless (35.76 percent) and large farm (26.93) households than among small farm (16.38 percent) households, $\chi^2(2, N=408) = 8.230$, $p=.016$, $\varphi_{c=}.142$. Apart from this, receiving relief, and watching at night were positively associated with landlessness although that were not significant [receiving relief, $\chi^2(2, N=408) = 1.565$, $p=.452$, $\varphi_{c=}.062$ and watching at night, $\chi^2(2, N=408) = 2.052$, $p=.358$, $\varphi_{c=}.071$]. The trend of receiving relief and watching at night were found higher among the

landless households (29.66 percent & 37.92 percent) than small farm (25.45 percent & 30.91 percent) and large farm (19.23 percent and 26.92 percent) households (Table 7.13).

Educational Attainment and Coping Strategy

Education is considered as one of the crucial indicators that enhances coping capacity and quality of life of an individual (D'Oley et al., 1994). Educated persons are aware about consequences of any hazard. They take preparation in advance (Paul & Routray, 2011) to face unavoidable circumstances and they do not have to depend on others. This study also finds significant association between attainment of education and coping strategies of the respondents (Table 7.14). It is found that educated respondents (SSC and above) were less dependent on borrowing (23.26 percent) than the less educated (grade 1-10, 30.56 percent) and illiterate (43.00 percent) respondents, χ^2 (2, N=408) =8.622, p=.013, $\varphi_{c=}$.145).

Table 7.14: Relationship between Educational Attainment and Coping Strategies

Coping Strategies	Educational Attainment			Pearson Chi-Square	Sig. Value	Cram-er's V
	*Illiterate (%)	Grade 1-10 (%)	SSC& above (%)			
Borrowing	43.00	30.56	23.26	8.622	.013	.145
Receiving Relief	30.00	26.39	20.93	1.707	.426	.065
Coll. Water from distance	64.51	56.94	34.88	14.066	.001	.186
Purifying water by boiling	51.54	59.72	72.03	7.146	.028	.132
Eating sub-standard food	55.63	51.38	30.23	9.718	.008	.154
Reducing meal	46.76	41.67	39.53	1.206	.547	.054
Searching for alternative job	33.11	31.94	27.90	0.470	.791	.034
Collecting fuel	64.16	65.27	44.19	6.709	.035	.128
Taking shelter in safe place	29.69	31.94	18.60	2.631	.268	.080
Using alternative baby food	14.00	22.22	16.28	2.972	.226	.085
Non-hygienic defecation	39.25	38.89	20.93	5.483	.064	.116

*Some of them could write their name but had no formal education (n=293), Grade 1-10 (n=72), SSC & above (n=43), Total (n=408), df=2.

However, collecting water from distant sources was higher among the illiterate respondents (64.51 percent). It was decreased along with increasing educational attainment (grade 1-10, 56.94 percent and SSC and above, 34.88 percent) that indicates the significant relationship between educational attainment and collecting water from distant sources, χ^2 (2, N=408) =14.066, p=.001, $\varphi_{c=}$.186). Similarly, eating sub-standard food was also significantly associated with level of education of the respondents,χ^2 (2, N=408) =9.718, p=.008, $\varphi_{c=}$.154). It is found that eating sub-standard food was higher among the illiterate respondents (55.63 percent), while it gradually decreased among less educated (51.38 percent) and educated respondents (30.23 percent). In addition, collecting fuel was also higher among less educated (65.27 percent) and illiterate (64.16 percent) respondents than educated (44.19 percent) respondents, χ^2 (2, N=408) =6.709, p=.035, $\varphi_{c=}$.128). Actually educated respondents had no need to collect fuel during catastrophe as they were aware about consequences of flood and preserved fuel earlier. Apart from this, receiving relief, reducing number of meals, searching for alternative work and non-hygienic defecation system were found higher among the less educated respondents although that were not significant (Table 7.14).

Sex of the Respondents and Coping Strategy

Traditionally, women's role in community is not formally recognized in a patriarchal country like Bangladesh. Women are also poorly represented in the decision-making process in climate change policies.Their less participation was also found in training and awareness-building programs and decision-making processes at the household level (Climate Change Cell [CCC], 2009), rather they were involved in daily household chores such as collecting water; collecting, preparing and distributing food; taking care of family members etc. (BCAS, 2010)that are related to their traditional gender roles. However, the findings of the present study also show that nature of coping strategies was significantly associated with the gender identity of the respondents (see Table 7.15). It is found that slightly more than three-quarters of the female respondents (75.98 percent) collected water from distant sources, while less than half of the male respondents (44.18 percent) were found to collect water from distance to meet the scarcity of pure drinking water, χ^2 (2, N=408) =43.165, p<.001, $\varphi_{=}$-.325). In addition, participation in purifying water by using water purification tablet, χ^2 (2, N=408) =19.055, p<.001, $\varphi_{=}$-.216), purifying water by boiling,χ^2 (2, N=408) =4.370, p=.037, $\varphi_{=}$-.103) and eating sub-standard food,χ^2 (2, N=408) =52.347, p<.001, $\varphi_{=}$-.358) were significantly associated with sex of the

respondents. The findings show that participation of women in purifying water by tablet, purifying water by boiling, and eating sub-standard food was higher among women (49.91,60.29 and 70.10 percent respectively) than among men (28.33, 50.00 and 34.31 percent respectively).

Table 7.15: Relationship between Sex of the Respondents and Coping Strategies

Coping Strategies	Sex of the Respondents*		Pearson Chi-Square	Sig. Value	Phi Coefficient
	Male (%)	Female (%)			
Borrowing	41.18	36.27	1.033	.309	.050
Receiving Relief	29.90	26.96	.434	.510	.033
Coll. Water from distance	44.18	75.98	43.165	.000	-.325
Purifying water by tablets	28.33	49.91	19.055	.000	-.216
Purifying water by boiling	50.00	60.29	4.370	.037	-.103
Eating low standard food	34.31	70.10	52.347	.000	-.358
Reducing meal	45.59	44.61	.040	.842	.010
Searching for alternative job	31.86	32.84	.045	.832	-.010
Collecting fuel	44.12	80.39	57.117	.000	-.374
Taking shelter in safe place	30.88	26.96	.763	.382	.043
Using boat for movement	36.76	13.23	30.118	.000	.272
Using alternative baby food	12.75	18.63	2.669	.102	-.081
Remaining awake at night	43.14	29.41	8.313	.004	.143
Using non-hygienic sanitation	27.45	47.06	16.776	.000	-.203

*Male (n=204), Female (n-204), Total (n=408).

Again, collecting fuel, χ^2 (2, N=408) =57.117, p<.001, $\varphi_=$-.374), and using non-hygienic defecation,χ^2 (2, N=408) =16.776, p<.001, $\varphi_=$ -.203) were also significantly associated with sex of the respondents. Data show that participation in collecting fuel and using non-hygienic sanitation system were higher among female respondents (80.39 and 47.06 percent) than male (44.12 and 27.45 percent). On the other hand, using boats for movement, χ^2 (2, N=408) =30.118, p<.001, $\varphi_=$.272) and remaining awake at night and

watching, χ^2 (2, N=408) =8.313, p=.004, φ_c=-.143) were significantly higher among men (36.76 and 43.14 percent) than women (13.23 and 29.41 percent) (Table 7.15).

7.8 Nature of Problems Faced by Women during Flood

The previous section shows that flood-affected people, both male and female, faced some common problems during floods. The question was placed before the respondents during interviews and FGD sessions whether women facedany problem that was different in nature from men. The respondentsexpressed a variety of opinions about nature of problems faced by women during flood that were related to their traditional gender-specific roles and physical condition. The respondents of both of the villages cited almostthe same problems faced by women during flood (Table 7.16).

Table 7.16: Opinions on Problems faced by Women during Flood

Problems faced by women during flood	Male (n=204)		Female (n=204)		Total (n=408)	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Cooking	167	81.86	192	94.12	359	87.99
Collecting fuel	125	61.27	196	96.08	321	78.68
Collecting drinking water	128	62.75	190	93.14	318	77.94
Maintaining *purdah*	111	54.41	169	82.84	280	68.63
Managing reproduct. health	109	53.43	170	83.83	279	68.38
Defecating	108	52.94	141	69.12	249	61.03
Insecurity	90	44.12	139	68.14	229	56.13
Defecating by children	84	41.18	97	47.55	187	44.36
Too much stress of work	69	33.82	44	21.57	113	27.70
Others	5	2.45	8	3.92	13	3.19

The largest number of the respondents (87.99 percent, of whom 94.12 percent women, compared to 81.86 percent men) reported thatwomen faced problem in cooking food during flood as the ovens and surroundings of their houses were inundated. Mazid (a 56-year-old farmer of *Ajogara*) said:

> *"It was very difficult for women to cook food during flood as the kancha oven became wet. It was very difficult for women to make a fire in those ovens. Second, dry fuel such as leaves, straw or cow-dung also got wet. Therefore, women faced difficulty inpreparing food during flood."*

However, nearly all of the female respondents (96.08 percent) and slightly less than two-thirds of the male respondents (61.29 percent) said that women had to face problem in collecting fuel during flood. One of the respondents, Amena (a 55-year-old housewife) of *Chinaduli*, stated the problem of collecting fuel in the following way:

"The compound of our house was inundated. The shed of fuel was also submerged. All of the fuels got wet. It became difficult to get dry fuel such as dry leaves, straw, and cow-dung. Again it was very difficult to dry the wet fuel due to rain."

The third-highest number of the respondents (77.94 percent), of whom 62.75 percent were men, compared to 93.14 percent women, pointed out that womenalso facedproblems in collecting water during floods as most of the tube-wellswere inundated. On the other hand, more than two-thirds of the respondents (68.63 percent) reported that women faced problem in maintaining *purdah*. Actually, they had to collect water from distance in spite of various difficulties. They had to collect fuel, dry fuel on road or others' houses and move from here to there for various purposes. Therefore, it was difficult for them to maintain *purdah*. However, problem of managing reproductive health also emerged during flood as to the opinion of more than two-thirds of the respondents (68.38 percent). The respondents expressed that the surroundings of the house were sub-merged and water was polluted, thus women had to face difficulty in managing reproductive health. It is significant to mention that flood also created problem for women related to their security. As per opinion of more than half of the respondents (56.13 percent), women felt insecure during flood because of snake biting, disturbance of frogs and insects as well as disturbance of thieves. Apart from this, more than one-quarter of the respondents (27.70 percent) reported that workload on women increased as they had to collect water from distant sources, collect fuel, cook for the family members, and look after the children and elders and so on. They also faced other problems such as collecting rice or food, drying paddy etc.

7.9 Services Provided by GAs in AddressingWomen's Problems

Previous sections show that both men and women were seriously affected by flood. But womenwere found to face some extraordinary problems that were related to their gender specific needs and roles. The problemof women, therefore, should be taken into consideration with utmost sincerity in order to combat the flood situation successfully as they bear the major portion of familial burden during flood. Both GAs and NGOs are

assigned to provide support services to solve the problem of women under the purview of community-based disaster management program and disaster management policy of the GoB. But what was the situation of the study area? Did the GAs (the UP, Department of Public Health Engineering etc.) provide services to solve the problems of women?In response to this question,only a few of the respondents (13.24 percent) of*Ajogara*replied in the positive. On the other hand, the majority of the respondents of the same village (86.76 percent) replied that GAsdid not provide any service to solve the problem of women. In contrast,almost all of the respondents of *Chinaduli* (93.63 percent) stated that GAs provideda variety of services in response to the problems of women (Table 7.17).

Table 7.17: Opinion on Services Provided GAs Addressing Women's Problems

Types of Opinion	Ajogara			Chinaduli			Grand Total
	Male	Female	Total	Male	Female	Total	
Yes	15 (14.71)	12 (11.76)	27 (13.24)	95 (93.14)	96 (94.12)	191 (93.63)	218 (53.43)
No	87 (85.29)	90 (88.24)	177 (86.76)	7 (6.86)	6 (5.88)	13 (6.37)	190 (46.57)
Total	**102 (100)**	**102 (100)**	**204 (100)**	**102 (100)**	**102(100)**	**204 (100)**	**408 (100)**

7.9.1 Types of Services Provided by GAs in Addressing Women's Problems

The GAs such as Local Government (the Union *Parishad*),Department of Public Health Engineering (DPHE), Ministry of Health and Family Welfare (MoHFW) etc. providedthe flood affected women with various kinds of services during flood to combat their problems. The key informants (chairmen and members of the UP, and UNO) claimed that the Union *Parishad* supplied food grains, water purification tablet, pure drinking water, and medicine under test-relief operation in emergency phase to assist women to combat the problems evolved due to flood. The respondents also acknowledged the fact that they got the above mentioned services during flood. Rahima (a 41-year-old housewife of *Ajogara*) replied:

"I got some water purifying tablets to purify water along with 20 kgs of rice from the UP during flood. It was very helpful for me as water of tube-wells was not useable and dry fuel was not available to boil the water for purification."

Khaleda (a 38-year-old housewife of *Chinaduli*), reported in the following way:

"I got 20 kgs of rice and 20 kgs of wheat during flood from the UP as test-relief. It was essential for me to mitigate food crisis. If I had not got these food grains I would have to suffer more with my children for food crisis."

However, Ministry of Health and Family Welfare provided various types of health services among the flood victims. They organized special arrangement for women. For example, they checked up the health of the pregnant mothers, children and other people through mobile medical teams and community clinics, supplied medicine and advisedthe people to abide by health rules during flood. Rebeka (a 27-year-old young lady of *Chinaduli*) said in this regard:

"It was very difficult to go to the hospital for regular check-up during flood. But a mobile medical team came to our village and examined my health during my pregnancy period. It was very fruitful for me."

The DPHE ensured the available sources of pure drinking water. They set up new tube-wells in high place andjoined additional new pipe with the old tube-well to ensure supply of safe drinking water. Jabbar (a 35-year-old handloom worker of *Ajogara*) said:

> *"Almost all of the tube-wells of our locality were submerged during flood. We were suffering from scarcity of pure drinking water. Then the Upazila engineering office set up a new tube-well on a high place that solved the problem of scarcity of pure drinking water."*

7.10 Services Provided by NGOs in AddressingWomen's Problems

Like GAs, NGOs play a pivotal role in disaster management in terms of providing the flood-affected people with financial and other supports services for mitigating the flood induced problems (Joseph, 2006). But what did they do to address women's problem as they face special types of problems? The respondents were asked whether NGOs provided any service to solve the problem faced by women during flood. Almost similar answers were found to the question, whether services were provided by GAs during flood. Table 7.18 shows thatthe majority of the respondents of *Ajogara* (82.35 percent) replied that NGOs provided no service at all to address the problems faced by women during flood. Only a few of respondents(117.65 percent) of this village replied in the positive with regard to NGO servicesto address the problems of women. In contrast, most of respondents of *Chinaduli* (92.65 percent) replied positively in this regard.

Table 7.18: Opinion on Services Provided by NGOs in Addressing Women's Problems

Types of Opinion	Ajogara			Chinaduli			Grand Total
	Male	Female	Total	Male	Female	Total	
Yes	17 (16.67)	19 (18.63)	36 (17.65)	92 (90.20)	97 (95.10)	189 (92.65)	225 (55.15)
No	85 (83.33)	83 (81.37)	168 (82.35)	10 (9.80)	5 (4.90)	15 (7.35)	183 (44.85)
Total	**102 (100)**	**102 (100)**	**204 (100)**	**102 (100)**	**102(100)**	**204 (100)**	**408 (100)**

7.10.1 Types of NGO Services Providedfor Solving Women's Problems

Some NGOs such as *Manobmukti Sangstha, Souhardo* and National Development Program (Food Security for Ultra Poor project) were found to work in *Ajogara* during field work of the study. On the other hand, the first two organizations, mentioned above, that is, *Manobmukti Sangstha* and*, Souhardo* and another NGO, Eco-social Development Organization (ESDO), were found to work in *Chinaduli* during data collection. As to the opinion of the respondents, the above-mentioned NGOs provided the flood-affected women with various types of services that include supplying drinking water, water purifying tablet, cooked food, fuel, health services for women and others, and supplying materials for managing menstruation. Momena (a 25-year-old housewife of *Chinaduli*) reported: "*Manobmukti Sangstha (a local NGO) gave us cooked food during last flood. They also distributed medicine among the flood affected-people*." Shima (a 35-year-old school teacher of *Chinaduli*) replied: "*NGOs gave us medicine and sanitary materials for managing menstruation."*

However, women of *Ajogara* alleged that NGOs were not attentive to solve their problems. Key informants also acknowledged the fact andopined that the study village *Ajogara* was separated from mainland by water body, and its communication was not favorable to frequent movement during flood. Therefore, services of GAs and NGOs were not available in this village during emergency phase. One of the key informants, Hamid (UP member), explained the situation in the following way:

> *"All the roads and paths of Ajogara village were submerged during flood. It was not easy to move from here to there in this village. Moreover, torrential rain, gusty wind, and high wave created panic among the people. Therefore, in spite of goodwill, it was not possible to provide services instantly among Ajogara people during flood."*

7.11 Mechanisms Adopted by Women in Coping with Floods

Women of the study area are very much familiar withflood situation as they were born and grew up in flood-prone area. They havea long experience to live with floods that usually stay for nearly two to three months in each year. But unpredicted and prolonged floodas well as high flow of water appeared to women as devastating because those createdmultifarious problems, of which someare related to women's gender-specific roles. Consequently, they adopt some tactics to cope with the situation although they have no easy way. Women of the study area were found to adopta variety of mechanismsin accordance with the nature of problems to cope with catastrophic situation. It has been mentioned earlier that women were found to face severe problem in collecting drinking water since almost all of the tube-wells went under water. They had to collect water for drinking and other household uses from distance. They had to go for collecting water by boat or raft. Even some of them, who did not have boat or raft, had to go on foot to fetch water that conforms to the findings of Begum (1995). However, it was very difficult for them that is echoed in the following statement:

> *"During last flood, tube-well of my house went under water. We could not use the water of this tube-well as it was mixed with polluted water of flood. As a result, I had to go to Afzal's house to fetch water. I used to go there on foot through water as we had no boat. It was very difficult to cover a long distance by wearing sari because sometimes it got entangled",* Khadiza (a 40-year-old housewife of *Ajogara*).

Halima (a 47-year-old housewife of *Chinaduli*) replied in the following way with regard to coping with flood situation:

> *"All of the tube-wells of our locality went under water during flood. Only nozzles of some tube-wells were outside of the water. We had to collect water from those tube-wells. It was very difficult for us as there was no place to put 'kolshi' (earthen water jar).We (women who used to go to fetch water) helped each other to collect water byapplyinga special technique. One used to put our kolshi under the nozzle and another started to pump. When we saw that fresh water came out that was different in color from flood water, then we threw away the previous water and filled the kolshi again with fresh water. Then we brought it."*

It is found through FGDs and interviews that women of the study area severely faced fuel crisis during flood. The key informants also mentioned this problem during interviews. Actually, women were acquainted with this situation for a long time and they preserved some fuel (dry wood, straw, cow-dung etc.) in advance for using in emergency period. But problem became acute while flood was prolonged. After exhausting stored fuel, they had to face severe fuel crisis. They had to use jute-stalk of house fences and old pillars of the house as fuel to meet the fuel crisis. In addition, it became difficult for women to cook food as the ovens got submerged. Sometimes, they had to pass the night by eating only husked-paddy (rice) and water as they could not cook. Rahima (a 50-year-old housewife of *Ajogara*) explained her coping strategy in the following way:

> *"My oven got wet during flood. It became difficult to make a fire in that oven. Then I had to use moveable oven (alok/alga chula). Even sometimes we did not get a piece of dry place to set up the moveable oven for cooking. Consequently we used to set moveable oven on one corner of chowki (a four-legged bedstead or platform) for cooking. It was very difficult to cook in this way. Again, if there was gusty wind, it became more difficult to cook. Therefore, sometimes we were compelled to stop cooking and pass the night by eatingonly husked-paddy with water."*

Problem of sanitation also became acute for women during flood as most of the toilets were submerged. It was a serious problem for all, butwomen had to face more difficulties in defecating by maintaining*purdah*. Although men could defecate on water sitting from raft or boat going far from their house, it was not possible for women. Hence, some of them made a little space by surrounding it with old cloth or leaves of palm tree for defecation.However, women also felt insecure during flood, especially at night. They suffered from fear of snakes, frogs, and theft. The male members of the family kept vigil by being awake throughout the night. The participants in focus group discussionsand key informants also spoke of the same strategy to combat flood situation.

7.12 Mechanisms of Solving Food Shortage

Most of the respondents, both male and female (93.63 and 94.12 percent respectively) of the study area reported that they facedacute food shortage during flood. Even sometimes

they were compelled to pass the night without dinner. Accordingly, they adopted different types of strategies to cope with the situation. The majority of the respondents (81.20 percent) were found to reduce the amount of food consumption to adapt to the situation. They reduced amount of food intake in various ways. For example, they used to eat their full meal for breakfast and dinner, but partial for lunch. Sometimes they used to eat only rice and vegetable, but no fish or meat. Sometimes they ate only rice with mashed potato. On the other hand, two-thirds of the respondents (66.58 percent) were found to consume cheap food items during flood. For example, they bought cheap rice, small fishes instead of big fish. However, about one-third of the respondents (32.90 percent) reported that they borrowedmoney and food items (rice, paddy) from friends, or relatives. Sometimes they borrowedmoney from money lenders with high interest to cope with the situation (Table 7.19).

Table 7.19: Mechanism to Cope with Food Shortage during Flood by Sex

Mechanisms	Sex of the Respondents		Total (n=383) Frequency (%)
	Male (n=191) Frequency (%)	Female (n=192) Frequency (%)	
Reducing amount of food	156 (81.67)	155 (80.73)	311 (81.20)
Eating cheap food	109 (57.07)	146 (76.04)	255 (66.58)
Reducing number of meals	112 (58.64)	96 (50.00)	208 (54.31)
Borrowing	66 (34.55)	60 (31.25)	126 (32.90)
Eating only vegetable	39 (20.42)	45 (23.44)	84 (21.93)
Receiving relief	45 (23.60)	33 (17.19)	78 (20.37)

However, one-fifth of the respondents (20.37 percent) reported that sometimes they passed the danger period by eating only vegetables (potato, arum) and green leaves. They may have consumed this type of food items once or twice during flood. But it was very pathetic for them. Few of them (20.37 percent) were found to manage the situation by receiving relief materials distributed by GAs and NGOs (Table 7.19).Amjad (a 35-year-old rickshaw-puller of *Ajogara*) explained his adopted mechanisms to cope with food shortage during flood in the following way:

"During the last flood we (my family) severely suffered from food shortage. We reduced the number of meals from three to two per day. Even I used to buy low-standard rice that was comparatively cheap."

Mofij (a 44-year-old day laborer of *Chinaduli*) confessed:

> *I had to suffer fromsevere foodshortage during last flood. I once had no money to buy rice and other food items. I collected some greens from my neighbors' land on request. We passed the night by eating the greens. Then on the next day I got relief goods from an NGO. In this way I passed the disastrous day with my family members.*

12.1 Gender Differentials in Consuming Less Amount of Food

It is found in a previous section that the majority of the respondents (81.20 percent) were compelled to consume less amount of food to cope with food shortage during flood. But the question is who consumed the less amount of food? Is there any difference between men and women in consuming lesser amount of food?

Table 7.20: Distribution of Percentage of Having Less Amount of Food

Sex of the Respondents	Who consumed less amount of food	Household Category			Total
		Small income	Middle income	High income	
Male	Only women	11 (10.78)	1 (5.26)	5 (14.29)	17 (10.90)
	Only men	0	0	0	0
	Both	91 (89.22)	18 (94.74)	30 (85.71)	139 (89.10)
	Total	102 (100)	19 (100)	35 (100)	156 (100)
Female	Only women	5 (4.76)	4 (20.00)	5 (16.67)	14 (9.03)
	Only men	0	0	0	0
	Both	100 (95.24)	16 (80.00)	25 (83.33)	141 (90.97)
	Total	105 (100)	20 (100)	30 (100)	155 (100)

Percentages have been shown in parenthesis.

The largest number of the respondents(89.10 percent male and 90.97 percentfemale)reported that both men and women consumed lesser amount of food due to

food crisis. Only a few of the male (10.90 percent) and female (9.00 percent) respondents stated that only women consumed lesser amount of food. But none of the respondents reported that men consumed lesser amount of food (Table 7.20). Although there were no major differences among the number of male respondentsof small-income, middle-income, and high-income households in consuming less amount of food, in case of female respondents, major differences were found. Among the female respondents, 4.76 percent from small-income, 20.00 percent from middle-income and 16.67 percent from high-income households mentioned that they reduced the amount of food consumption as part of saving food for future days (Table 7.20). But why did only women consume lesser amount of food? In response to this question,female respondents replied that they (male members of family) worked hard outside the home, so they needed more food. Male respondents also replied almost in the same way. One of male respondents of *Ajogara* from poor category, Bazlu (a 35-year-old laborer), replied:

> *"I had to do hard workoutside the home for the whole day and I needed more food. If I did not eat enough food that I needed I could not work hard. So my wife requested me to eat required amount of food. But she usually ate lesser amount of food during food crisis."*

One of the female respondents of *Chinaduli* (Rafija, a 32-year-old housewife) says:

> *"My husband is a rickshaw-puller. He works hard the whole day. So he needs enough food. If he eats lesser amount of food, he would not be able to pull rickshaw the whole day. Therefore, I requested him to have required amount of food. It also happened during flood."*

It should be mentioned that the participants of FGD also cited the same reasons regarding eating lesser amount of food.

7.13 Men'sRole in Combating the Flood Situation

Both men and womenreported that male members of the family playedmultifarious roles during flood to combat the situation. More than three-quarters of the respondents (78.43 percent) informed that male members of the family made*machang* (platform) in courtyard for staying or keeping valuable goods given that their houseswere submerged.

Table 7.21: Distribution of Roles Played by Male in Combating Flood

Roles played by male	Male (n=204)		Female (n=204)		Total (n=408)	
	Freq.	**Percent**	**Freq.**	**Percent**	**Freq.**	**Percent**
Making platform	152	74.51	168	82.35	320	78.43
Collecting food	127	62.25	186	91.18	313	76.72
Repairing house	141	69.12	125	61.27	266	65.20
Preserving valuable goods	119	58.33	132	64.71	251	61.52
Raising bed	105	51.47	118	57.84	223	54.66
Taking shelter	75	36.76	74	36.27	149	36.52
Protecting children	53	25.98	69	33.82	122	29.90
Feeding the cattle	45	22.06	67	32.84	112	27.45
Collecting medicine	47	23.04	53	25.98	100	24.51
Protecting the elderly	41	20.10	53	25.98	94	23.04
Collecting fodder	50	24.51	44	21.57	94	23.04
Others	11	5.92	2	0.98	13	3.19

Like making platform, more than three-quarters of the respondents (76.72 percent) added that male members of the family collected food during flood as food shortage became a serious problem during the disaster. The interview data revealed that the male members also repaired houses (65.10 percent) as they became worn-out (Table 7.21). They also played a pivotal role in preserving valuable goods (61.52 percent) on higher place of their house or at other places such as house of friends or relatives or academic institutions.

Data further revealed that male members of the family raisedthe bed during flood (54.66) by putting bricks under legs of wooden cot after inundation of floor of the house. They were found to use this bed for staying, keeping valuable goods andcooking food in moveable earthen oven. Other roles performed by menwere: taking shelter in safe place (36.52 percent), protecting children (29.90 percent), feeding the livestock (27.75 percent), collecting medicine (24.51 percent), protectingthe elders (23.04 percent), collecting fodder (23.04 percent), and others (setting toilet, joining additional pipe with tube-well and soon).

7.14 Women's Rolein Combating the Flood Situation

Women, in general, remain involved in different types of work at household level in daily livelihood process. They do not get exemption from performing their role during flood. Rather they areto do more jobs in addition to daily household works. The large majority of the respondents (84.31 percent), 88.24 percent of women, compared to 80.39 percent of men, cited that like in the normal period preparing food for the family members was the most essential job of womenduring flood. They were found to prepare meal for the family members bearing all kinds of suffering since the situation was not favorable to do this job. However, data revealed that women had major responsibility during flood to take care of the children along with other family members. They put enormous attention to look after their children, especially to ensure their safety,as per opinion of more than three-quarters of the respondents, i.e., 78.43 percent (Table 7.22).They did this job along with doing their daily household chores such as preparing and distributing food, collecting water, washing cooking utensils etc. They also shouldered a critical responsibility to fulfill the other daily needs of the family members.

Table 7.22: Distribution of Roles Played by Women during Flood

Roles played by women during flood	Male (n=204)		Female (n=204)		Total (n=408)	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Preparing food	164	80.39	180	88.24	344	84.31
Looking after children	139	68.14	181	88.73	320	78.43
Collecting water	124	60.18	147	72.06	271	66.42
Collecting fuel	115	56.37	155	75.98	270	66.18
Collecting food	113	55.39	144	70.59	257	62.99
Preserving dry food	122	59.80	102	50.00	224	54.90
Looking after ill people	95	46.57	99	48.53	194	47.55
Looking after the elderly	80	39.22	86	42.17	166	40.69
Taking care of livestock	51	25.00	85	41.67	136	33.33
Taking care of poultry	78	38.24	51	25.00	129	31.62
Preserving seed	46	22.55	53	25.98	99	24.26
Feeding the livestock	41	20.10	51	25.00	92	22.55
Collecting fodder	33	16.18	47	23.04	80	19.61
Others	15	7.35	21	10.10	36	8.82

Nonetheless, two-thirds of the respondents (66.42 percent) opined that women collected water for drinking, cooking and washing utensils. Sometimes, they collected it from distance ignoring the various kinds of hazards. They also collected fuelto mitigate the fuel crisis as per the opinion of two-thirds (66.18 percent) of the respondents, of whom 75.98 percent women, compared to 56.37 percent men. Actually, severe fuel crisis was created during flood as the fuels got wet because of submerging of fuel sheds or fuel stack. Therefore, very often they had to dry wet fuel for using in crisis period. However, a significant number of the respondents (62.99 percent), 55.39 percent men and 70.59 percent women, added that women were involved in collecting food items. Sometimes they collected relief provided by GAs and NGOs or collected green leaves from others' farms to fulfill food shortages that were very difficult jobs for them.

However, interview data revealed that they also preservedsome dry food for disastersituation apprehending that if it remains for longer period (54.90 percent).They also took care of sick (47.55 percent) and elder people of the family (40.69 percent). Among other roles played by women to combat flood were: taking care of cattle, feeding the cattle, collecting fodder, rearing poultry and doing other jobs (collecting medicine etc.). The findings show that roles played by women during flood such as preparing food, collecting water, food and fuel; looking after children, elders and sick people (Table 7.22) are related to their gender-specific roles.On the other hand, rolesplayedby men that include repairing house, raising floor of the house, making platform, and so on (Table 7.21)are traditionally considered as men's role.

However, women were also found to assist their male counterparts in combating flood along with performing their own roles that conforms to the following statement:

> *"Workload increased for me during floods. I had to manage everyday household works such as procuring and preparing food, collecting water, taking care of children, elders, and sick people and so on. In addition, I helped my husband in repairing house (to post a pole), raising floor of the house, making platform, feeding cattle and collecting fodder,"* Hasina(a 46-year-old housewife of *Ajogara*).

7.15 Taking Shelter during Flood

According to the respondents and key informants, almost all of the houses in the study villages were submerged during floods of 1998, 2004 and 2007, and most of the houses were inundated during the last flood in 2011. As a result, to have a safe shelter became a great concern for most of the respondents during that catastrophic situation.

Table 7.23: Distribution of Responses of Taking Shelter by Sex

Place of taking shelter	Male		Female		Total	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Relatives' house	10	4.90	10	4.90	20	4.90
Neighbors' house	31	15.20	61	29.90	92	22.55
Academic institutions	26	12.75	10	4.90	36	8.82
Flood control dams	20	9.80	12	5.88	32	7.84
Roads	43	21.08	38	18.63	81	19.85
Own house	74	36.27	73	35.78	147	36.03
Total	**204**	**100**	**204**	**100**	**408**	**100**

It is found from the Table 7.23 that a little less than two-thirds of the respondents (63.97 percent)were compelled to leave their residence due to over-flood. In contrast, slightly more than one-third of them (36.03 percent) stayed at their residence. They took shelter at neighbors' house (22.25 percent), relative's residence (4.90 percent), academic institution (8.82 percent), flood control dam (7.84 percent), and the high road thatwas little bit far from the residence (19.85 percent). It should be mentioned that those who stayed back at their own houses during flood had to suffer from dreadful conditions that comply with the following statement:

"We stayed at our house during last flood. But it was very difficult to stay as the surroundings of the house; toilet and tube-well were inundated. We had to collect water from distant sources. We had to go to far-away places for defecation," Afzal (a 47-year-old day laborer of *Ajogara*).

Table 7.23 also shows that women were more likely to take shelter at neighbors' houses (29.90 percent) rather than at academic institutions (4.90 percent) or on flood control dams (5.88 percent) considering the matter of maintaining *purdah* and sanitation facilities. In contrast, some of the men took shelter at academic institutions (12.75

percent) and flood control dams (9.80 percent) as maintaining *purdah* was not matter of concern for them.

7.16 Reasons for Not Offering Shelter by Neighbors

It is found in earlier section that a significant number of the flood victims took shelter on flood control dam, high road or at academic institutions. They were asked why they took shelter at these places. Some of the respondents asserted that the neighbors were not eager to provide shelter during flood. Consequently, the study investigated the reasons for not offering shelter by the neighbors. Multifarious reasonswere found in this regard. Space constraint was found as one of the causes behind not offering shelter by the neighbors. Basically, most of the neighbors had no additional room or house to shelter others. Moreover, the flood victims naturally take shelter with poultry, livestock and other belongings that need more space and seem to be troublesome for owner of the house that conforms to the following statement:

> *"Actually, nobody hasadditional houses more than their requirement in our locality. Despite this limitation, many neighbors are eager to share their houses with shelterless people. But the fact is that the sheltered people themselves create problems. Generally, they take shelter along with their poultry, livestock and other belongings. The poultry and livestock of sheltered people damagethe vegetable garden, saplingsandother valuable goods of the house owner. That is why the neighbors have lost their eagerness to offer shelter during flood,"* Khadiza(a 51-year-old shelterless woman of *Ajogara*).

Another respondent of *Chinaduli* said:

> *"Most of the people of our locality are very poor. They live in great difficulty with their family members at a single house. They have no additional house to offer others. The situation becomes deplorable during flood. In addition, the persons whose house is not inundated would not like to offer shelter, rather very often they avoid the flood victims considering them as extra disturbance,"* Alif (30 year old rickshaw-puller).

However, the participants of FGDs and key informants cited almost the same reasons for not offering shelter. They say that more or less, all of the people suffer from negative

consequences of floods. They become mentally shocked. Besides, ifthey offer shelter, they are compelled to share all things such as kitchen, bedroom, cow-shed, etc. Nobody would like to bear such types of disturbance now. Therefore, the neighbors avoid the flood victims.

7.17 Experience of Staying at Flood Shelters

They respondents were asked whether they have ever stayed at flood shelter during flood. A few of them (14.71 percent, 18.63 percent of men, compared to 10.78 percentof women) replied that they stayed at flood shelter at least one time in past five years (Table 7.24). Actually, no flood shelterwas found during field work in the study area. But some people took shelter at academic institutionsduring floods that were considered by them as flood shelters. However, GAs and NGOs provided some support servicessuch as medicine, water, cooked food, other food grains, primary health care etc.among the sheltered people. On the other hand, they had to face some problems at these centers. Among those the problems of overpopulation,absence of separate rooms and toilets for men and women, dirtiness, problem of cooking, rough behavior of men with women wereremarkable.

Table 7.24: Distribution of Responses about Ever Staying at Flood Shelters

Types of Responses	Male			Female			Grand Total
	Ajogara	Chinaduli	Total	Ajogara	Chinaduli	Total	
Yes	15 (14.71)	23 (22.55)	38 (18.63)	12 (11.76)	10 (9.80)	22 (10.78)	60 (14.71)
No	87 (85.29)	79 (77.45)	166 (81.37)	90 (88.26)	92 (90.20)	182 (89.22)	348 (85.29)
Total	102 (100)	102 (100)	204 (100)	102 (100)	102 (100)	204 (100)	408 (100)

Percentages have been shown in parenthesis.

7.18 Public Health Situation

Although it is difficult to quantify the consequences and effects of flood on public health (Kolsky, 1999 cited in Few, 2003), it might be said that flood can increase the risk of different types of diseases, especially water-borne pathogen along with threat of sinking

and flowing away. People of the flood-affected areas suffer from different types of diseases during flood that might be caused by polluted water (Ahern et al., 2005). The situation of the study villages was not different in this regard (Table 7.25). The large majority of respondents(79.66 percent) were found to suffer from diarrhea during flood, of whom 74.51 percent were men, compared to 84.80 percent women. But the data indicate thatthe number of diarrhea-affectedmen was greater in*Ajogara* than that of *Chinaduli*. Thelargest number of themale respondents (88.24 percent) of *Ajogara* was found to be affected by diarrhea during floods in last five years whereas the percentage of *Chinaduli* was 60.78, who suffered from the same. Other diseases that became public health concern in the study villages were dysentery, fever, skin disease and others (cough, headache, jaundice etc). However, slightly more than two-thirds (66.40 percent) people of the study villages were found to suffer from fever during flood. In addition, more than half of the people were found to suffer from skin disease (58.09 percent) and dysentery (57.11 percent).

Table 7.25: Distribution of Percentage of Attack by Various Diseases

Name of the Diseases	Male			Female			Grand Total (n=408) F (%)
	Ajogara (n=102) F (%)	Chinaduli (n=102) F (%)	Total (n=204) F (%)	Ajogara (n=102) F (%)	Chinaduli (n=102) F (%)	Total (n=204) F (%)	
Diarrhea	90 (88.24)	62 (60.78)	152 (74.51)	87 (85.29)	86 (84.31)	173 (84.80)	325 (79.66)
Fever	87 (85.29)	90 (88.24)	177 (86.76)	80 (78.73)	18 (17.65)	98 (48.04)	275 (67.40)
Skin disease	71 (67.82)	40 (39.22)	111 (54.41)	70 (68.73)	56 (54.90)	126 (61.76)	237 (58.09)
Dysentery	76 (74.51)	33 (32.35)	109 (53.43)	69 (67.65)	55 (53.92)	124 (68.78)	233 (57.11)
Others	25 (24.51)	31 (30.39)	56 (27.45)	4 (3.92)	1 (0.98)	5 (2.45)	61 (14.95)

It should be mentioned that the more people, both men and women, of *Ajogara* than that of *Chinaduli* suffered from different kindsof diseases. Nonetheless, key informants, especially physician and health worker, opined that because of inundation the flood affected people could not maintain neat and cleanliness. In addition, very often they use polluted flood water for bathing, cooking and other household works that might be the cause of illness among the people.

7.18.1 Treatment Measures for Men

In spite of living in danger during catastrophic period, the people of the flood-affected areas take some measures for treatment according to their ability in order to lead healthy life.But it varies on the basis of location of the study area (Table 7.26 & 7.27). Although the majority of the respondents (79.90 percent) opined that medicine was bought after consultingdoctors (physicians) for better treatment of the male members of the family, the percentage of the respondents of *Chinaduli* (90.20 percent) was found higher than that of *Ajogara* (69.61 percent).In real sense, it was not physicians' advice as there was no physician withprofessional degree (e.g. MBBS or higher degree) in the study villages. Basically, they took advice of salesmen of drugstores, a quack and community health workers who were familiar to them as physicians. However, the number of respondents of *Ajogara* (25.98 percent) was found higher than that of *Chinaduli* (6.86 percent) to buy medicine from drugstore without having consultation with doctors for treatment**.** In fact, doctors as well as local medical assistants and community health workers were not available at *Ajogara*during flood as the village was surrounded by water and far from the mainland. The physicians as well as community health workers were not willing to stay there. Therefore, the people of *Ajogara* sometimes were compelled to buy medicine without consulting doctors.

Table 7.26: Treatment Measures Taken for Recovery of Men

Types of Treatment	Ajogara (n=204) Frequency (%)	Chinaduli (n=204) Frequency (%)	Total (n=408) Frequency (%)
Doctors' consultation & medicine	142 (69.61)	184 (90.20)	326 (79.90)
Homeopathic treatment	13 (6.37)	68 (33.82)	81 (19.85)
Buying only medicine	53 (25.98)	14 (6.86)	67 (16.42)
No treatment	3 (1.47)	3 (1.47)	6 (1.47)
Herbal treatment	0	1 (0.49)	1 (0.24)
Others *(jhar-fuk, pani- pora)*	5 (2.45)	3 (1.47)	8 (1.96)

The respondents received more than one type of treatment.

However, one-third of the respondents (33.82 percent) of *Chinaduli* and a small number respondent (6.37 percent) of *Ajogara* reported that they took advice of homeopathic doctors for treatment of cold, fever etc. The variation in having consultation with homeopathic doctors depends upon their availability. The study finds that there were two

chambers of homeopathic doctors at *Chinaduli* bazaar but none at *Ajogara*. The people of *Ajogara* had to go to mainland even for homeopathic treatment. Therefore, some of them were disinterestedto go to the doctors. It should be noted that a few of them were found to depend on *jhar-fuk,pani-pora*etc. (curing a disease by means of faith-healing).

7.18.2 Treatment Measures for Women

Data show that almost the same measures were taken for treatment of women likewise the men (Table 7.26 and 7.27). They bought medicine after consultingdoctor for better treatment (70.34 percent), bought only medicine without having consultation with doctors (19.85 percent), took advice of homeopathic doctors(10.29 percent) for treatment of cold, fever, etc. and some of them still depend on *jhar-fuk*, *pani-pora*, etc. But it is worth mentioning that 9.07 percent respondents reported that no measures were taken for the treatment of women in case of their illness, whereas the percentage for men was only 1.47, that indicates that women are still neglected in the study area in case of having treatment in their illness.

Table 7.27: Treatment Measures Taken for Recovery of Women

Types of Treatment*	Ajogara (n=204)	Chinaduli (n=204)	Total (n=408)
Doctors' consultation & medicine	122 (59.80)	165 (80.88)	287 (70.34)
Buying only medicine	53 (25.98)	28 (13.73)	81 (19.85)
Homeopathic treatment	14 (6.86)	28 (13.73)	42 (10.29)
No treatment	19 (9.31)	18 (8.82)	37 (9.07)
Herbal treatment	-	1 (0.49)	1 (0.24)
Others *(jhar-fuk, pani-pora)*	7 (3.43)	8 (3.92)	15 (3.68)

* The respondents received more than one types of treatment. Percentages have been shown in parenthesis

It should be mentioned that nowadays the respondents of the study area do not wait for doctors' advice if they are affected by diarrhea.Butthey seek help from doctor or get admission into hospital if the condition of patient becomes critical. Primarily they use oral saline for combating dehydration.It is now available at any pharmacy, even at any shop in rural areas. Usually, they buy it from pharmacy/shop. Sometimes they make it at home. In

fact, almost all of the people of Bangladesh now know how to make oral saline by pure drinking water, sugar/gur and salt. They have learnt it through awareness building program of mass media and from field-level health workers of GAs and NGOs. Participants of FGD narrated this matter in a good manner. But it is a matter of irony that sometimes they have neither sugar/gur nor money in their possession during flood. Then they really remain in danger. However, the above-mentioned treatment measures are taken for ordinary diseases such as fever, dysentery, cold, headache, skin disease etc. But if they are affected by acute disease, then they visit the hospital or private practitioners.

7.18.3 Special Medical Services Provided by GAsfor Women

It is found earlier that women were confronted with different types of problems related to health and reproductive health during flood. Women, in general, were found to suffer from diarrhea, dysentery, skin diseases etc. and face problem to manage menstruation. Moreover, pregnant mothers could not move freely and could not go to hospital for regular check-up. In these circumstances, the respondents (both male and female) were asked whether GAs and NGOs provided any service to solve women's problemsrelated to health. The answer was not palatable. The large majority of the respondents (86.52 percent) alleged that GAs provided no special health service for women at all.Opinion of Rafija (a 25-year-old housewife of *Ajogara*) is pertinent here. She said:

> *"Medical services for women were rare in our village during flood. One of my neighbors suffered from difficulties related to pregnancy but she could not neither go to the hospital nor get services at home. But it is true that mobile medical team distributed some medicine among the villagers."*

However, some of the key informants (women members of the UP) also admitted this limitation. But they argued that it was not possible for them to provide special services for women as they had to think about many other problems, in general, such as food crisis, scarcity of pure drinking water, lack of safe shelter, illness etc. On the other hand, some key informants (UP chairmen and members) claimed that they opened temporary health center in the flood affected area during flood. Similarly, a few of the respondents (13.48 percent) reported that GAs provided women with special health services during flood. But the prevalence of medical services provided by GAs was higher in *Chinaduli* than that of *Ajogara* (Table 7.28).

Table 7.28: Opinion on Special Medical ServicesProvided by GAs for Women

Opinion	Male			Female			Grand Total
	Ajogara	Chinaduli	Total	Ajogara	Chinaduli	Total	
Yes	7 (6.86)	20 (19.61)	27 (13.24)	5 (4.90)	23 (22.55)	28 (13.73)	55 (13.48)
No	95 (93.14)	82 (80.39)	177 (86.76)	97 (95.10)	79 (77.45)	176 (86.27)	353 (86.52)
Total	102 (100)	102 (100)	204 (100)	102 (100)	102 (100)	204 (100)	408 (100)

Figures in parenthesis show percentage

As per the opinion of the respondents (13.48), GAs provided various types of services to address health-related problems of women. For instance, health workers checked-up the health condition of women, especially pregnant women, gave advice and distributed medicine among them for primary healthcare. One of the respondents remarked:

> *"Health workers of community clinic used to provide women with health services at temporary health center during flood. I went to that center for check-up my blood pressure, and weight. They told me after examining that my blood pressure was OK but I was suffering from malnutrition. They suggested me to take care of myself and eat nutritious food such as fish, meat and vegetable to ensure my required amount of weight at advanced stage of pregnancy. But it was not possible for my family to buy fish, meat, and fruits due to economic hardship,"* Ajiba (a 44-year-old housewife of *Chinaduli*).

7.18.4 Special Medical Services Provided by NGOsfor Women

NGOs are one of the stakeholders in CBDM approach. The government has assigned some duties and responsibilities to NGOs through disaster management policy and plan to make success its CBDM program at local level. Consequently NGOs respond to flood victims aiming to help them survive the floods by ensuring public health protection by supplying food and non-food items such as medicine, oral saline, sanitary latrines etc. (Oxfam, 2005). But what was the actual situation in the study villages? The question whether special health services were provided for women by NGOs was placed before the respondents to seek the answer to the above question.

Table 7.29: Opinion on Special Medical ServicesProvided by NGOsfor Women

Opinion	Male			Female			Grand Total
	Ajogara	Chinaduli	Total	Ajogara	Chinaduli	Total	
Yes	8 (7.84)	22 (21.57)	30 (14.71)	7 (6.86)	30 (29.41)	37 (18.14)	67 (16.42)
No	94 (92.16)	80 (78.43)	174 (85.29)	95 (93.14)	72 (70.59)	167 (81.86)	341 (83.58)
Total	102 (100)	102 (100)	204 (100)	102 (100)	102 (100)	204 (100)	408 (100)

Figures in parenthesis show percentage

A large number of the respondents (83.58 percent) replied in the negative in response to the above question.In contrast, only a few of them (16.42 percent) replied in the positive in this respect (Table 7.29). Data indicate that the prevalence of special health services for womenprovided by NGOs was higher in *Chinaduli*than that of *Ajogara*in terms of number of beneficiaries (Table 29). However, the respondents expressed that NGOsaimed at helping the flood-affected women to ensure public health protection by providing some special health services for women such as consultation on the ordinary disease, check-up of the pregnant mother, and distribution of medicine, materials for managing menstruation and so on.One of the female respondents of *Chinaduli* acknowledged:

> *"Health workers of NGOscame to our locality during flood. They distributed water purifying tablets, medicine for fever and dysentery, and oral saline for diarrhea. They also distributed birth control pills, sanitary pad and other essential materials. Thanks them for distributing these essential materials, otherwise it would have been difficult for us to manage all things,"* Aklima(a 35-year-old housewife).

7.19 Decision-maker in Coping with Flood Situation

Similar to other countries in South Asia, Bangladesh society is dominated by patriarchy (Quisumbing and Maluccio, 2000), where women have limited power in decision-making (Sultana, 2020). But what happened in the study area during flood in respect of making decision? Did women make any decision independently? The findings show that although women have little power to make decision alone, their participation was found in decision-making process in making decisions related to coping with flood situation.

Table 7.30: Opinion on Decision-making in Coping with Flood

Decision-maker in Response Phase	Male		Female		Total	
	Number	Percent	Number	Percent	Number	Percent
Husband alone	29	14.22	11	5.39	40	9.80
Wife alone	4	1.96	5	2.45	9	2.21
Husband-wife jointly	97	47.55	90	44.12	187	45.83
Family members jointly	74	36.27	98	48.04	172	42.16
Total	204	100	204	100	408	100

Table 7.30 shows that 47.55 percent men, compared to 44.12 percent women, took their decisions jointly (husband-wife) in coping with flood. On the other hand, slightly less than half of the female (48.04 percent),compared to more than one-third (36.27 percent) of the male respondents, reported that all family members took their decisions together in response phase, which indicates that at least women had participation in deliberation at household level. On the other hand, information given by 9.80 percent respondents (14.22 percent men, compared to 5.39 percent women), the researcher confirmed that husband (or male member of the family) made the decisions alone in coping with flood.In contrast, only 2.21 percent of the respondents reported that women took their decisionsalone related to coping with flood (Table 7.30) that indicates women's minimum authority to make decision alone.

7.20 Reasons for Not Taking Women's Opinion in Decision-making

It has been found that in some cases (about 10 percent), husbands (or male members of the family) took decisions alone in coping with floods. Even they did not ask women for their opinions. Consequently, those respondents, who said that husbands (or male members of the family) took decisions alone, were asked why opinion of women was not sought in the decision-making process. Contrasting opinion was found in response to this question. Male respondents said that menwere efficient enough to make appropriate decision in coping with flood situation. Besides, women were not a position to make decision as they became bewildered due to catastrophic situation, that why women's opinion was not taken in making decisions. Although a few women reported the same, many of them alleged that men would not like to lose their authority and control over

women. Besides, they are not eager to recognize women's intellectuality and competency that is why they did not seek women's opinion in decision-making process.

7.21 Summary and Conclusion

The main purpose of this chapter is to analyze the nature of vulnerability and coping capacity of the flood victims in the study villages as well as to analyze the contribution of GAs and NGOs in assisting the flood-affected people in coping with the unexpected situation created by flood. The findings show that in spite of taking various measures in advance, the individual households were vulnerable to the flood situation in terms of food shortage, lack of shelter, economic hardship, fuel crisis, lack of pure drinking water, problem of defecation and so on. Although both men and women were found to face a lot of problems, women faced some additional problems that were related to their gender-specific roles such as problem in collecting water, fuel and food; problem in cooking, preserving fuel, keeping household utensils, defecation and managing menstruation. However, both men and women were found to play a pivotal role to cope with the situation. But the nature of roles played by women, like the nature of problems faced by them during flood, was also related to their traditional gender roles. For example, women had to collect water, prepare food, distribute food, take care of children, elders and sick people, feed the livestock and collect fodder and so on. In addition, they were also found to assist their male counterparts in various jobs. For example, they helped the male members of their family to put poles to the house, to build platform, to raise ceiling of the house and so on, along with doing their regular household works that created double burden on them. On the contrary, none of the respondents claimed that men helped women to do their work.

However, GAs and NGOs were found to assist the flood victims to cope with the situation in various ways. They provided various types of services among the flood victims to ensure their survival. They operated rescue operation to salvage the marooned people, took them away to safe place, distributed food, medicine and other essential items. But their contribution to solving women's problem was found very minimal. Neither GAs nor NGOs paid adequate attention to solve women's problems. The study also finds that the prevalence of both government and non-government services varied depending on the location of study villages. The prevalence of services was found greater in *Chinaduli* than that of *Ajogara* in terms of number of beneficiaries. It might be due to the disadvantaged

location of Ajogara village. The findings indicate that in spite of having various services provided by GAs and NGOs in preparedness phase and adopting a variety of measures in advance at household level, the people of the study area were vulnerable to flood. They continued their livelihoods with great difficulty during flood. But how did they adapt to the post-flood situation? Did they become further vulnerable to flood or could combat the situation effectively? The next chapter deals with this issue.

Chapter VIII
Recovery from Flood: Adaptation Strategies of the Affected People in Post-flood Situation

8.1 Introduction

Recovery is one of the important phases of community-based disaster management. It refers to the activities, taken after the impact, related to the re-establishment of pre-disaster social and economic routine provision of financial and other services for the victims, as well as repair of the properties that are destroyed by disasteraimed at achieving return to normality(Kapucu, 2008:244; Kreps et al., 2006:20). On the other hand, adaptation involves the action that people take in response to reduce adverse impact or to take advantage of any benefits associated with that impact (Jones & Preston, 2010). Adaptation also means adjustment in natural or human ecosystem in response to actual or expected climate stimuli or their effect, which moderate harm (United Nations, 2006). This chapter analyzes the post-flood situation in the study area andadaptation strategies of the affected people at household level to reduce adverse impact of flood. It also discusses the roles of GAs and NGOsto re-establish pre-disaster social and economic condition to return to normality. However, this chapter also highlights the gender-specific roles played by men and women to adapt to the post-flood situation. Discussion of this chapter is based on primary data collected through interview, FGD and observation. Data collected from key informants (KIs) have alsobeen analyzed here. Data show that the flood-affected people adopted a variety of indigenous mechanismsalong with receiving assistance from GAs and NGOs to adapt to the post-flood situation.

8.2 Aftermath of Flood and Problems Faced by the Affected People

It is found in previous chapters that flood caused unprecedented human sufferings and damaged growing crops and other properties. Many people were displaced because of damage done to their residences. They were also found to suffer from various kinds of problems such as food crisis, scarcity of drinking water, lack of fuel, illness, problem of sanitation and so on. The legacy continued even after receding of flood water. Food crisis was found as the most severe problem followed by illness in the study villages (Table 8.1).

Table 8.1: Distribution of Problems Faced by Men and Women after Flood

Types of Problems*	Male			Female			Grand Total (n=408)
	Ajogara (n=102)	Chinaduli (n=102)	Total (n=204)	Ajogara (n=102)	Chinaduli (n=102)	Total (n=204)	
Food Crisis	95 (93.14)	75 (73.53)	170 (83.33)	97 (95.10)	80 (78.43)	177 (86.76)	347 (85.05)
Illness	85 (83.33)	59 (57.84)	144 (70.59)	91 (89.22)	84 (82.35)	175 (85.78)	319 (78.19)
Problem of shelter	75 (73.53)	71 (69.61)	146 (71.57)	83 (81.37)	81 (79.41)	164 (80.39)	310 (75.98)
Financial Crisis	87 (85.29)	69 (67.66)	156 (76.47)	81 (79.41)	62 (60.78)	143 (70.19)	299 (73.28)
Problem of sanitation	92 (90.20)	42 (41.18)	134 (65.69)	88 (86.27)	60 (58.82)	148 (72.55)	282 (69.12)
Lack of hea-lth services	81 (79.41)	55 (53.92)	136 (66.67)	79 (77.45)	60 (58.82)	139 (68.14)	275 (67.40)
Problem of movement	77 (75.49)	61 (59.80)	138 (67.65)	72 (70.59)	65 (63.73)	137 (67.16)	275 (67.40)
Problem related to edu.	62 (60.78)	76 (74.51)	138 (67.75)	57 (55.88)	73 (71.57)	130 (63.73)	268 (65.69)
Scarcity of dinking water	79 (77.45)	20 (19.61)	99 (48.53)	82 (80.39)	70 (68.63)	152 (74.51)	251 (61.52)
Lack of fuel	05 (4.90)	09 (8.82)	14 (6.86)	95 (93.14)	90 (88.24)	185 (90.69)	199 (48.77)
Problems of cooking	09 (8.82)	11 (10.78)	20 (9.80)	98 (96.08)	62 (60.78)	160 (78.43)	180 (44.12)
Lack of employment	76 (74.51)	47 (46.08)	123 (60.29)	15 (14.71)	05 (4.90)	20 (9.80)	143 (35.05)
Lack of agric-ultural inputs	15 (14.71)	59 (57.84)	74 (36.27)	11 (10.78)	40 (39.22)	55 (26.96)	129 (31.62)
Problem of repro. health	0 (0)	0 (0)	0 (0)	38 (27.45)	35 (34.31)	73 (35.78)	73 (17.89)
Others	15 (14.71)	12 (11.76)	27 (13.24)	17 (16.67)	20 (19.61)	37 (18.14)	64 (15.68)

* More than one answer has been accepted. Percentages have been shown in parenthesis.

Table 8.1 reveals that a large number of the respondents (85.05 percent) were found to face food crisis. The main cause of food crisis was damage of growing paddy (*amon* and *aush*). But unemployment (45.05) and financial crisis (73.28 percent) further aggravated the situation. However, more than three-quarters of the respondents (78.19 percent) were found to suffer from illness. Water-borne diseases spread out in an epidemic form.

Although both men and women were found to be affected by various diseases, the number of women (85.78 percent) was higher than that of men (70.59). The reasons for illness of more women might be rooted in the nature of their involvement in daily works. They had to keep in touch with polluted flood water for various reasons such as doing household works, feeding livestock and so on. Therefore, they were more likely to be affected by water-bore diseases such as diarrhea, dysentery, jaundice, and skin disease. But health services/medical facilities as well as reproductive health services were not available as per the opinion of more than two-thirds of the respondents (67.40 percent).

It is further found in previous chapters that a significant portion of the households left their houses as those were not habitable due to inundation. Moreover, other houses were also affected by flood in one or another way. Some houses were completely damaged, some were dilapidated and rests of the houses were comparatively in good condition. But they were not fit for habitation as per the opinion of three-quarters of the respondents (75.98 percent). Especially women (80.39 percent) mentioned that lack of safe shelter was one of the barriers to retaining regular livelihood as well as maintaining *purdah.* However, sources of water were severely affected by flood. Most of the tube-wells, the main source of drinking water, were out of order due to inundation. Consequently, the people of the study area (61.52 percent) had to suffer from lack of pure drinking water right after flood until the affected tube-wells were repaired. Like the sources of water, sanitation systems were badly affected by flood. Many toilets were washed away, some broke down and some were unusable due to over-flow, and breaking down of enclosure walls (fences). Thus, more than two-thirds of the respondents (69.12 percent), women in particular (72.55 percent), mentioned that they had to face problem in defecation. Actually, men used to go to places far from their homestead for defecation in open space on an urgent basis, but it was not possible for women.

However, difficulties in movement existed even after flood in the study area. A significant portion of the respondents (67.40 percent) mentioned that it was difficult for them to move from here to there as the roads were damaged and fields were not suitable to across. Actually, the situation was even worse than the situation existed during flood. For example, the people could use boat or raft during flood. But now they could use neither boat nor other vehicles (van, cart etc.). Therefore, movement of the people was severely hampered immediately after flood. Moreover, the total education system was

disrupted due to flood. The minor students could not go to school regularly due to water, mud, and damaged of road on the one hand; the school infrastructure was completely or partially damaged on the other. Besides, because of damaged books and other educational materials, the students could not continue their studies at home too. Again, due to financial crisis, their guardians were not in a position to buy them new books and other material immediately after flood.

Unemployment was found as another problem in the study area as per the opinion of more than one-third of the respondents (35.05 percent). Actually, demand of labor decreased sharply for harvesting as the growing crops were damaged. On the other hand, post-flood agricultural work did not resume right after flood. Therefore, unemployment was created severely. Again, the farmers were found to suffer from lack of agricultural inputs (31.62 percent). They were not in a position to buyagricultural inputs such as seeds, fertilizer, pesticide etc. due to adverse financial condition. However,the flood severely affected the availability of fuel. About half of the people (48.77 percent) were found to face fuel crisis even after flood, since their stored fuel was either finished or got wet. Even some participants cited in FGDs that their stored dry fuel washed away by flood water. Therefore, they were facing fuel crisis. On the other hand, their cooking arrangement was also destroyed. For instance, *kancha chula* (oven made of mud) was damaged and kitchen became damp that caused problem for cooking as per the opinion of 44.12 percent respondents.

It should be mentioned that gender differential was found in the case of problems faced by men and women that was also related to their gender-specific roles. For example, the number of women was found higher than that of men who mentioned that they suffered from scarcity of drinking water (74.51 percent of women, compared to 48.53 percent of men), lack of fuel (90.89 percent of women, compared to 6.86 percent of men) and problem of cooking (78.75 percent of women, compared to 9.80 percent of men). On other hand, the number of men was found higher than that of women who mentioned that they suffered from agricultural inputs (36.27 percent men, compared to 26.36 percent women) and lack of employment (60.29 percent men, compared to 9.80 percent women). It should be further mentioned that in most of the cases, *Ajogara* people suffered more than that of *Chinaduli* in the context of various types of problems (Table 8.1).

8.3 Getting Back to Normal Life after Floods: Roles Played by Men and Women

The main concern of the flood-affected people is to get back to regular life after flood. It starts with returning homeby those who leave their residence due to inundation. Both men and womenperformvarious kinds of roles to get back to normal life.

8.3.1 Men's Roles in Getting Back to Normal Life after Floods

At first men concentrate to repair damaged dwelling houses to make it habitable so that they could stay there. Table 8.2 shows that the large majority of the men (91.67 percent) were found to repair the damaged houses as early as possible, since they became unusable due to flood. The large majority ofwomen (88.24 percent) also reported that male members of their family took necessary action to repair damaged houses. The repairing works include posting new pillars, surrounding the house area, repairing roof etc. However, cleaning surroundings and repairing sources of water were the second and third-most preferred adaptation strategies for men to get back to regular life as per the opinion of about three-quarters (72.06 percent) and about half (47.30 percent) of the respondents. Other strategies of men were to pay attention to agricultural works (22.55 percent),to make new houses (16.42), and to look for works (fishing, selling labor, running small business etc.)

Table 8.2: Opinion of the Respondents on Roles Played by Men after Flood

Roles Played by Men	Male (n=204)		Female (n=204)		Total (n=408)	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Repairing houses	187	91.67	180	88.24	367	89.95
Cleaning surroundings	131	66.22	163	79.90	294	72.06
Repairing sources of water	92	45.10	101	49.51	193	47.30
Starting agricultural works	72	35.29	20	9.08	92	22.55
Making new houses	41	20.10	26	12.75	67	16.42
Searching for work	34	16.67	25	12.25	59	14.46
Others	22	10.78	21	10.29	43	10.54

8.3.2 Women's Roles in Getting Back to Normal Life after Floods

Like the men, women also performed various roles after flood in order to get back to normal life. According to the large majority of the respondents (83.58 percent), of whom

90.69 percent were women and 76.47 percent were men, womenfirst concentrated to clean surroundings of their houses after flood as the surroundings of their houses were dirty and inhabitable. The second-highest number of the respondents (63.48 percent) reported that women played a pivotal rolein repairing their damaged houses that includes washing, leveling and coating of the floor, and repairing the *kancha* oven. They also participated in kitchen gardening (55.15 percent) to fulfill the future demand and planted seedlings beside their houses (45.59 percent) as investment for future resource that will also be helpful in protecting environment degradation. They also helped their male counterparts in agricultural works (24.02 percent) by preparing seed, drying crops, irrigating water etc. They also did other jobs as agricultural laborer, maid servants, earth cutting workers etc. for survival (Table 8.3).

Table 8.3: Opinion of the Respondents on Roles Played by Women after Flood

Roles Played by Women	Male (n=204)		Female (n=204)		Total (n=408)	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Cleaning surroundings	156	76.47	185	90.69	341	83.58
Repairing houses	107	52.45	152	74.51	259	63.48
Kitchen gardening	115	56.37	110	53.92	225	55.15
Plantation beside houses	97	47.53	89	43.63	186	45.59
Help in agricultural works	71	34.80	27	13.24	98	24.02
Others	26	12.73	28	13.73	54	13.24

Although both men and womenplayed important roles in repairing the damaged house, the nature of their works was different from each other. For example, men set the new pole to the house, surrounded the house with fence, repaired the roof of the house etc. On the other hand, women's roles comprisedwashing, leveling and coating the floor, repairing the *kancha* oven and so on. They also assistedtheir male counterparts in this phase to adapt to the situation. One of the male respondents explained the women's jobs after flood in the following way:

> *"My wife did tremendous works after flood. After passing away of the flood water, she cleaned the surroundings of the house. She did various work to repair the damaged house such asshe coated the floor of the house, repaired the stairs,*

washed the utensils etc. She also assisted me while I was setting the pole to the house," Rahim (a 39-year-old day laborer of *Ajogara*).

It should be mentioned that women performed their above-mentioned roles along with doing other daily households works. One of the female respondents replied in this regard:

"I did everything to regain regular life. First, I washed the surroundings of my residence. I coated the floor and stairs. I also helped my husband in fencing the house. I did all these jobs along with doing my daily duties including preparing food, collecting water and taking care of my two babies," Kajoli (a 56-year-old housewife of *Chinaduli*).

It is obvious that although both men and women played vital roles after flood, women had to bear double burdens for adaptation.

8.4 Strategies Adopted in Repairing Damaged Houses

It is found in the above section that the flood-affected people of the study villages started to repair their houses with utmost priority to lead regular life because they could not concentrate to other jobs until ensuring their habitation. But what types of strategies did they adopt to repair their damaged houses as they suffered from financial crisis due to damage of crops and other properties? A significant portion of the respondents (40.41 percent), about half of the women (47.37 percent), compared to slightly more than one-third of men (34.76 percent), were found to repair their houses themselves to make them fit for habitable (Table 8.4) which indicates that repairing houses by themselves had a close link with sex of the respondents, χ^2 (1, N=339) =5.536, p=.019, φ_c=-.128.

However, one-third of the respondents (33.33 percent) were found to repair their damaged houses by helping each other that indicates the existence of the feelings of cooperation and social bondage among the villagers. On the other hand, a little portion of them (15.63 percent) were found to repair house immediately after flood by hiring labor along with doing some works done by themselves and only a few of them (3.54 percent), who were comparatively better financially, reported that they repaired their houses by hiring labor. Rest of them (2.65 percent) took assistance of GAs, NGOs and relatives in repairing their houses. Data show that men were more likely than women to hire labor and take assistance of GA-NGO to repair their house, but that were not statistically significant. On

the other hand, women were more likely than men to do their jobs by helping each other, it was also not statistically significant (Table 8.4).

Table 8.4: Relationship of Strategies to Repair Houseswith Sex

Strategies	Opinion	Sex		Total
		Male	Female	
By self	Yes	65 (34.76)	72 (47.37)	137 (40.41)
	No	122 (65.24)	80 (52.63)	202 (59.59)
	Total	187 (100)	152 (100)	339 (100)
	Pearson Chi Square: 5.536, df 1, Sig. value .019, phi -.128			
By helping each other	Yes	59 (31.55)	54 (35.53)	113 (33.33)
	No	128 (68.45)	98 (64.47)	226 (66.67)
	Total	187 (100)	152 (100)	339 (100)
	Pearson Chi Square: 0.596, df 1, Sig. value .440, Phi -.042			
By hiring labor along with self	Yes	34 (18.18)	19 (12.50)	53 (15.63)
	No	153 (81.82)	133 (87.50)	286 (84.37)
	Total	187 (100)	152 (100)	339 (100)
	Pearson Chi Square: 2.052, df 1, Sig. value .152, Phi .078			
By only hiring labor	Yes	9 (4.81)	3 (1.97)	12 (3.54)
	No	178 (95.19)	149 (98.03)	327 (96.46)
	Total	187 (100)	152 (100)	339 (100)
	Likelihood Ratio: 2.095, df 1, Sig. value .148, Phi .076			
Others (assistance of relatives, GAs and NGOs)	Yes	8 (4.28)	1 (0.66)	9 (2.65)
	No	179 (95.72)	151 (99.34)	330 (97.35)
	Total	187 (100)	152 (100)	339 (100)
	Likelihood Ratio 4.956, df 1, Sig. value .026, Phi .112			

Percentage has been shown in parenthesis.

8.5 Services Provided by Government Agencies after Flood

It is found earlier as well as in different studies (Islam, 2006, Morshed, 2007 and Nasreen, 2001)) that the people of the flood-affected area encounter various kinds of problems after flood that extensively hampers their daily lives. Very often it becomes difficult for them to combat the situation without having outside assistance. In this circumstance, the government agencies take some rapid actions to rebuild the community as well as provide the flood victims with some services to restart the livelihood process. The respondents were asked whether they receivedany service of government agencies (GAs) after flood to get back to normal life.Themajority of the respondents of all

categories gave affirmative answer to this question (Table 8.5 & 8.6). But a significant difference was found between the number of the respondents receiving services based on location of the study villages as well as sex of the respondents. The large majority of therespondents (91.67 percent) of *Chinaduli* were found to receive various types of services of GAs after last flood. In contrast, less than two-thirds of the respondents (62.75 percent) of *Ajogara* were found to receive the services of the same agencies that indicates the association of location of the villages with receiving services, χ^2 (1, N=408) =48.481, p<.001, $\varphi_{=}$-.345.

Table 8.5: Relationship of Receiving Services of GAs after Flood with Location ofthe Study Villages

Whether received services	Ajogara (Isolated from mainland)		Chinaduli (Mainland)		Total	
	Number	Percent	Number	Percent	Number	Percent
Received	128	62.75	187	91.67	315	77.21
Didn't receive	76	37.25	17	8.33	93	22.79
Total	**204**	**100**	**204**	**100**	**408**	**100**

Pearson Chi-Square: 48.481, df 1, Sig. value .000, Phi -.355

However, the number of respondents who were benefited from services provided by GAs significantly varied by sex. The number of men was significantly higher than that of women, χ^2 (1, N=408) =5.028, p=.025, $\varphi_{=}$.111, who received various kinds of services of GAs. Table 8.6 shows that more than three-quarters of men (81.86 percent) received government services while the percentage of women was 72.55.

Table 8.6: Relationship of Receiving Services with Sex Provided by GAs after Flood

Whether services received	Male		Female		Total	
	Number	Percent	Number	Percent	Number	Percent
Received	167	81.86	148	72.55	315	77.21
Didn't receive	37	18.14	56	27.45	93	22.79
Total	**204**	**100**	**204**	**100**	**408**	**100**

Pearson Chi-Square: 5.028, df 1, Sig. value .025 Phi .111.

8.5.1 Types of Government Services Provided after Flood

It is found that the government agencies took some rapid actions to rebuild the community and also provided the flood victims with some services to restart their livelihood process. Among the services some wererelated to the benefit of the whole community and others were provided for the well-being of individual households. The GAs such as the UP, LGED repaired the *kancha* roads, bridges and culverts that were destroyed by flood to revive the communication system from which the whole community had been benefited. On the other hand, the respondentswere found to receive a variety of services provided by GAs from which individual households had been benefited.

Table 8.7: Types of Services Received by the People after FloodProvided by GAs

Types of service received	Male (n=167)		Female (n=148)		Total (n=315)	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Distributing Seed	51	30.54	103	69.59	154	48.89
Aid to repair house	69	41.32	81	54.23	150	47.62
Distributing CI sheet	58	34.73	65	43.92	123	39.05
Repairing tube-well	38	22.75	84	56.76	122	38.73
Distributing Medicine	27	16.17	84	56.76	121	38.41
Distributing food grains	40	23.75	65	43.92	105	33.33
Supplying Pesticides	33	19.76	71	47.97	104	33.02
Supplying Fertilizer	28	22.75	64	43.24	102	32.38
Credit with low interest	25	14.97	55	37.16	80	25.40
Health service	36	21.56	32	21.62	68	21.59
Dist. new tube-well	19	11.38	40	27.03	59	18.73
Interest free credit	9	5.39	27	18.24	36	11.43
Distributing Net	16	9.58	3	2.03	19	6.03
Aid to make new house	6	3.59	8	5.41	14	4.44
Distributing goat	5	2.99	7	4.73	12	3.81
Distributing boat	2	1.20	2	1.35	4	1.27

Table 8.7 shows that about half of the respondents (48.89 percent), who said that GAs provided various types of services after flood, received seed after flood as agricultural assistance from the UP that was helpful for the affected people to start post-flood cultivation. A significant portion of households were fund to receive aid in cash money

(47.62 percent) to repair their damaged houses. On the other hand, more than one-third (39.05 percent) of affected households reported that they received CI sheet for making a tiny house, and a few of them (4.44 percent) were found to receive aid to make a new house. However, more than one-third of the respondents (38.73 percent) received services from Department of Public Health Engineering (DPHE) to repair their tube-wells that were out of order. The DPHE also distributed new tube-wells among the poor villagers through the UP. The DPHE provided this service aimed at ensuring available source of pure drinking water that was also related to protecting public health.

A significant portion of the respondents (38.41 percent) were found to receive medicine provided by GAs after flood for treatment of various ordinary diseases. GAs also gave other health services along with distributing medicine through local community clinic and mobile medical team. Among the services checking blood pressure and weight, providing advice for ordinary disease and distributing medicine for fever, cold, cough, dysentery, skin disease and oral saline for diarrhea were remarkable. However, one-third (33.33 percent) of the respondents reported that their households received food grains (rice and wheat) under test relief program. It was essential for them to mitigate food crisis as they suffered from severe food shortage after flood.

It was found earlier that households of about three-quarters of the respondents (73.28 percent) experienced severe financial crisis. They faced difficulties in continuing their livelihoods. It was really difficult for the small farm households to restart their post-flood cultivation. They needed agricultural supports. In response to this crying need, The UP in assistance with Agricultural Extension Department distributed fertilizer and pesticides among the farmers and one-third of the respondents reported that they received pesticides (33.02 percent) and fertilizer (32.38 percent). They also received loan with low interest (25.40 percent) for recovery from flood. It is important to mention that GAs also distributed net and boat among the people, whose livelihood depended on fishing. A few of the respondents were found to receive nets (6.03 percent) and boats (1.27 percent). It was very helpful for them to survive after flood.

8.6 NGO Assistance for Post-flood Adaptation

NGOs provide essential services to combat flood like other disasters. It plays an important role in every phase of disaster management from preparedness to recovery

(Joseph, 2006), especially to cope with flood (Akter, 2004; Khandker, 2007). Local NGOs in association with international aid agencies (e.g. DFID, International Red Cross Society) also provided some services for the adaptation to post-flood situation.Majority of the respondents (79.90 percent) were found to receive NGO services after flood for better adaptation but significant difference was found between the numbers of beneficiaries in accordance with the location of the study villages (Table 8.8).

Table 8.8: Relationship of Receiving NGO Services after Flood with the Location of Study Villages

Opinion on receiving services	Ajogara (Isolated from mainland)		Chinaduli (Mainland)		Total	
	Number	Percent	Number	Percent	Number	Percent
Received	143	70.10	183	89.71	326	79.90
Didn't receive	61	29.90	21	10.29	82	20.10
Total	**204**	**100**	**204**	**100**	**408**	**100**

Pearson Chi-Square: 24.420, df 1, Sig. value .000, Phi -.245

The prevalence of NGO assistance after flood was found higher in *Chinaduli* village (situated in mainland) than that of *Ajogara* village (isolated from mainland),χ^2 (1, N=408) =24.420, p<.001, $\varphi_{=}$-.245. The large majority of the respondents (89.71 percent) of *Chinaduli* village were found to receive various types of services provided by NGOs after flood, while the percentage of *Ajogara* village was 70.10. The reasons for less prevalence of NGO service in *Ajogara* might be the distance of this village from mainland and inconvenient communication system.Like during flood, it was very difficult to reach this village by crossing the river even after flood. Some key informants acknowledged this backdrop as being behind less prevalence of NGO service in this village.

8.6.1 Types of Post-flood NGO Assistance

Like GAs, NGOs extended their cooperation in different ways to assist the flood victims to adapt to the post-flood situation and also repaired destroyed infrastructure to reinstate the pre-flood provisions. A significant number of the respondents (43.25 percent) reported that NGOs took necessary measures to repair *kancha* roads to restore communication and transportation system of the study villages from which the people, in general, got positive result. However, distributing medicine among the flood-affected

people was the major support of the NGOs, from which individual households were benefited. More than one-third of the respondents (37.42 percent), of whom 59.60 percent were women, compared to 18.29 percent men, reported that they received medicine after flood distributed by NGOs. The NGO efforts played a pivotal role in helping the people lead a healthy life.

Table 8.9: Distributionof Types of Post-flood NGO Assistance

Types of NGO assistance	Male (n=175)		Female (n=151)		Total (n=326)	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
Repairing road	53	30.29	88	58.29	137	42.02
Supplying medicine	32	18.29	90	59.60	122	37.42
Aid to repair house	22	12.57	75	49.69	97	29.75
Supplying seed	40	22.86	39	25.83	79	24.23
Distributing food grains	39	22.29	29	19.21	68	20.86
Distributing CI sheet	24	13.71	34	22.52	58	17.79
Supplying fertilizer	27	15.43	23	15.83	50	15.33
Aid to make new house	42	24.00	7	4.64	49	15.03
Repairing tube-well	20	11.23	29	19.21	49	15.03
Supplying pesticides	22	12.57	20	13.25	42	12.88
Distributing tube-well	18	10.29	24	15.89	42	12.88
Providing health services	19	10.86	19	12.58	38	11.66
Distributing net	30	17.14	1	0.66	31	9.51
Dist. interest-free credit	12	6.86	14	9.27	26	7.98
Distr. credit at low interest	6	3.43	13	8.61	19	5.83
Distributing cash money	8	4.57	0	0	8	2.45
Supplying boat	1	0.57	0	0	1	0.31

However, the second highest number of the respondents (29.75 percent) was found to receive financial aid to repair their damaged houses. They also received CI sheet (17.79 percent) and financial aid (15.03 percent) as relief to build/make a new house. However, the NGOs distributed seeds of various types of vegetables, wheat and paddy. They also distributed other agricultural inputs such as fertilizer, pesticides etc. among the people of

the study villages. Slightly more than 15 percent and about 13 percent of the sample households were found to receive fertilizer and pesticides respectively.

The NGOs distributed agricultural inputs aimed at enhancing post-flood agricultural activities to compensate for the loss during flood. The NGO intervention contributed in two ways to the livelihood process of flood-affected people. It created job opportunity for unemployed people in agriculture sector and enhanced production in agricultural sector. They distributed food grains among the flood victims. Both distribution of food grains and food production inputs contributed to mitigation of food crisis after flood.

However, the NGOs put enormous attention to mitigate water crisis evolved after flood due to disorder of tube-wells. In response to water crisis, the NGOs took measures to repair the disordered tube-wells and distributed new tube-wells under joint ownership of the people to ensure access to pure drinking water. Fifteen percent of the sample households were found to receive services from the NGOs to repair their disordered tube-wells. Another thirteen percent reported that the NGOs set up tube-wells for common use.They also distributed fishing nets and boats among the people so that they could continue their livelihood by fishing.

8.7 Special Services for WomenOffered by GAs after Flood

Women of the study area were found to experience some problems that were related to their gender-specific needs. Those problems severely constrained their normal livelihood process after flood. In the circumstances, specific actions were immensely needed to combat these problems. Consequently, women were asked whether GAs provided them with special service to overcome the post-flood situation.Although majority of the respondents (61.76 percent) replied in the positive to this question, prevalence of government service for women was found significantly higher in *Chinaduli* than that of *Ajogara*,χ^2 (1, N=204) =26.901, p<.001. More than three-quarters of sample women of *Chinaduli* (79.41 percent) were found to receive special service of GAs, while the percentage of *Ajogara* was only 44.12 that indicate the significant association of location of the study villages with availability of government service (Table 8.10). However, the women who did not get special services of GAs were asked why GAs not offered special service to them. Multiple answers were found in this respect. Some of them alleged that GAs were not eager to address the problems of women, officials do not want to come this

area by crossing the river and muddy road. In addition, women were not eager to go to health center. Again some of them could not go to health center due to stress of work.

Table 8.10: Relationship of Receiving Special Services of GAs after Flood with Location of the Study Villages

Whether received services	Ajogara (Isolated from mainland)		Chinaduli (Mainland)		Total	
	Number	Percent	Number	Percent	Number	Percent
Received	45	44.12	81	79.41	126	61.76
Didn't receive	57	55.88	21	20.59	78	38.26
Total	**102**	**100**	**102**	**100**	**204**	**100**

Pearson Chi-Square: 26.901, df 1, Sig. value .000.

8.7.1 Types of Special Services of GAs for Women after Flood

Data show that out of the total female respondents, who received government services, more than three-quarters of them (76.98 percent) mentioned that GAs provided them with medical/health services. Mobile medical team and health workers did their medical checkup (measured the weight and blood pressure) and advised them about medication (Table 8.11).

Table 8.11: Special Services Provided by GAs for Womenafter Flood

Types of Services*	Ajogara (n=45)	Chinaduli (n=81)	Total (n=126)
Medical checkup & advice	36 (80.00)	61 (75.31)	97 (76.98)
Medicine supply	35 (77.78)	55 (67.90)	90 (71.43)
Relief distribution	10 (22.22)	15 (18.52)	25 (19.84)
Food for work	6 (13.33)	10 (12.35)	16 (12.70)
VGF	0 (0)	45 (55.56)	45 (35.71)
Stipend for girl students	0 (0)	25 (30.86)	25 (19.84)
Reproductive health services	0 (0)	20 (24.69)	20 (15.87)

*More than one answer has been accepted. Percentage has been shown in parenthesis.

However, the second highest number of women (71.43 percent) was found to receive various types of medicine for fever, cold, cough, diarrhea and other common diseases distributed by the GAs. About 20 percent of them were found to receive relief goods (rice and wheat). The local government (UP) created job opportunity for destitute women under food for work program as per the opinion of a few of the sample women (12.70 percent). Other services provided by GAs were distributing food grains under Vulnerable Group Feeding (VGF) program, awarding stipend to female/girl students at secondary level and providing reproductive health services. But none of the women of *Ajogara* mentioned VGF, stipend and reproductive health services as they did not get these services.It is found after discussion with local UP member of Ajogara that some of the females of this village got assistance after flood under VGF program. But the women think that it is a regular program, not for flood.

8.8 Special Services Provided by NGOs for Womenafter Flood

Like GAs, NGOs also provided some services for women to cope with post-flood situation.The large majority of the women reported that NGOs provided them with some services after flood, but widespread difference was found between the number of women of *Ajogara* and *Chinaduli* who received services, χ^2 (1, N=204) =15.141, p<.001.Table 8.12 shows that the large majority ofthe women of *Chinaduli* (80.39 percent) received services of NGOs, while only 54.90 percent women of *Ajogara* received the same after flood. Table 8.13 shows that the highest number of women (47.10 percent) received relief goods distributed by NGOs. They also received medicine and reproductive health services (40.58 percent).Health workers of the NGOs also examined the health condition of women and pregnant women.

Table 8.12: Relationship of Receiving Special Services Provided by NGOs after Flood with Location of the Study Villages

Whether received services	Ajogara (Isolated from mainland)		Chinaduli (Mainland)		Total	
	Number	Percent	Number	Percent	Number	Percent
Yes	56	54.90	82	80.39	138	67.65
No	46	45.10	20	19.61	66	32.35
Total	**102**	**100**	**102**	**100**	**204**	**100**

Pearson Chi-Square: 15.141, df 1, Sig. value .000.

Table 8.13: Types of Special Services Provided by NGOs for Women after Flood

Types of Services*	Ajogara (N=56)	Chinaduli (N=82)	Total (N=138)
Relief distribution	10 (17.86)	55 (67.07)	65 (47.10)
Medicine supply	15 (26.70)	41 (50.00)	56 (40.58)
Reproductive health services	25 (44.64)	31 (37.80)	56 (40.58)
Medical checkup & advice	16 (28.57)	15 (18.29)	31 (22.46)

*More than one answer has been accepted. Percentage has been shown in parenthesis.

8.9 Measures Taken in Agricultural Sector to Cope with Post-flood Situation

Flood adversely destroysthe standing crops. On other hand, prolonged flood makes delay in resuming post-flood cultivation. Therefore, people of the flood-affected area adopt various tactics after flood to overcome the loss (Younus, 2010). The male respondents were asked what types of measures were taken in agricultural sector to overcome the loss as well as to be prepared for coping with next flood (if it occurs). In response to this question, most of the respondents (*Ajogara* 71, *Chinaduli* 60, and Total 131) replied that they had no arable land, that is why they were not further asked any question[3]. However, it is found that out of the total respondents, who had cultivatable land, more than half of them (58.90 percent) 85.71 percent of *Chinaduli*, compared to 22.58 percent of *Ajogara*,cultivated flood-tolerant paddy (Table 8.14) so that the paddy could survive in flood water after remaining submerged for 5-7 days.

However, slightly more than half of the men having cultiviable land (53.42 percent), 83.33 percent of *Chinaduli*, compared to 12.90 percent of *Ajogara*, were found to cultivate jute in place of paddy as preventive measure, since flash floods completely destroy the growing paddy before ripening but they could harvest the jute before maturity although it yields less production. More than one-third of the respondents (39.73 percent) reported that they cultivated short-term crops (short-term leguminous seeds of pulses, short-term paddy etc.) that fulfilled their immediate needs. They also (39.73 percent) produced various types of vegetables (cabbage, cauliflower, potato, tomato, beans, bottle-gourd, cucumber etc.). However, many of them cultivated mustard (38.89 percent),

[3]It was found in FGD and informal discussion that some landless people cultivate vegetable and other crops as share-croppers.

various types of pulses (24.66 percent), sweet potato (15.07 percent) and spices (garlic, onions 20.55 percent).

Table 8.14: Distribution of Measures Taken in Agricultural Sector

Measures*	Ajogara (n=31)	Chinaduli (n=42)	Total (n=73)
Cultivate flood-tolerant paddy	7 (22.58)	36 (85.71)	43 (58.59)
Cultivate short-term crops	9 (29.03)	20 (47.62)	29 (39.73)
Cultivate jute in place of paddy	4 (12.90)	35 (83.33)	39 (53.42)
Cultivate mustard after flood	14 (45.16)	14 (33.33)	28 (38.89)
Cultivate pulses after flood	9 (29.03)	9 (21.43)	18 (24.66)
Cultivate sweet potato after flood	6 (19.35)	5 (11.90)	11 (15.07)
Cultivate spices after flood	4 (12.90)	11 (26.19)	15 (20.55)
Cultivate vegetables after flood	14 (45.16)	15 (35.71)	29 (39.73)

*More than one answer has been accepted. Percentage has been shown in parenthesis.

It should be noted that flood victimswere found to suffer from fund crisis. They spent almost all of their savings during flood. Therefore, it became difficult for them to invest in agricultural sector andwere compelled to lease (temporary) their land to sharecroppers.

8.10 Means of Adaptation to Post-flood Situation

Flood creates various types of problemin the affected area that hinder the everyday life of the people (Bilo, 2013; Islam et al., 2012; Khandker, 2007; Paul & Routray, 2010). Its adverse impact on livelihood pattern of the affected people remains even after flood. Therefore, flood-affected people adopt various types of tactics, apart from receiving GA-NGO supports,for the better adaptation to post-flood situation. However, the main problem, faced by the people in the study area, was financial crisis. It (financial crisis) deteriorated as they had to spend from savings, had to face unemployment, spend for medication and so on. Because of pecuniary hardship they had to depend on relief; assistance of relatives, neighbors, or friends. Some of them did other jobs apart from their main occupation to earn extra money to overcome the financial crisis as well as to continue their livelihoods. They also borrowed from relatives, neighbors and/or moneylenders.

Table 8.15: Means of Adaptation to the Post-flood Situation by Household Category

Means of Adaptation	Household Category			Total (n=408)	Chi-Square	Sig. value
	Small income (n=270)	Middle income (n=77)	High income (n=61)			
Assistance of relatives	175 (64.81)	49 (63.63)	33 (54.10)	257 (63.00)	2.468	.291
Changing occupation	123 (45.56)	29 (37.66)	13 (21.31)	165 (40.44)	12.447	.002
Selling valuable goods	61 (22.59)	33 (42.86)	37 (60.66)	131 (32.11)	38.102	.000
Receiving relief	86 (31.85)	26 (33.77)	18 (29.51)	130 (31.88)	.284	.867
Borrowing from relatives friends	80 (29.63)	30 (38.96)	18 (29.51)	128 (31.37)	2.539	.281
Assistance of neighbors	68 (25.19)	22 (28.57)	17 (27.87)	107 (26.23)	.455	.796)
Assistance of friends	67 (24.81)	15 (19.48)	18 (29.51)	100 (24.51)	1.890	.389
Borrowing from NGO	54 (20.00)	17 (22.08)	8 (13.11)	79 (19.36)	1.959	.376
Borrowing from money lender	40 (14.81)	14 (18.18)	4 (6.55)	58 (14.22)	4.006	.135
Selling land	3 (1.11)	2 (2.60)	3 (4.92)	8 (1.96)	3.951	.139
Leasing out land	2 (0.74)	0 (0)	2 (3.28)	4 (0.98)	4.241	.120

Figure in parenthesis shows percentage.*More than one means was taken by respondents. ** Monthly income up to Tk. 4000/- (Small income), Tk. 4001/- to Tk. 6000/- (middle income) and more than Tk. 6000/- (high income).

Note: Assistance of relatives, neighbors and friends refers to assistance in cultivation, repairing or making house, repairing source of water. It also includes borrowing daily essential goods. Borrowing includes cash money

Table 8.15 shows that about two-thirds of the sample households (63.00 percent) received assistance from their relatives for cultivation, repairing or making houses, repairing source of water and so on. However, respondents of all categories were found to take assistance from relatives. They also received the above-mentioned assistance from neighbors (26.23 percent) and friends (24.51 percent) that conform to the following statements:

"It was very difficult to complete all the works by me alone. So I took assistance of my friend to repair the roof of my house. I also helped him to plough his land," Rahim (a 30-year-old farmer of *Chinaduli*).

"My nephew helped me to repair my tube-well. Actually, I did not know how to repair tube-wells. So I sought his cooperation," Lalu (45-year-old handloom worker of *Ajogara*).

However, the second-highest number of the respondents (40.44 percent) was found to do other jobs, apart from their main occupation (Table 8.15). Actually, they changed their occupation temporarily to earn money as means of livelihood. Although respondents from all categories changed their occupation, the prevalence of changing occupation was found higher among the respondents of small-income households (45.56 percent) than that of middle-income (37.66 percent) and high-income households (21.31 percent), χ^2 (2, N=408) =12.447, p=.002. However, about one-third of the respondents (32.11 percent) opined that they sold out their valuable goods as a strategy for adaptation to the post-flood situation. Selling valuable goods as adaptation strategy was found higher among the high-income households (60.66 percent) than that of middle-income (42.86 percent) and small-income (22.59 percent) households, χ^2 (2, N=408) =38.102, p<.001. Actually, the people of small-income household had little amount of goods to sell after flood.

Receiving relief was found as another adaptation strategy among the sample households of all categories. About one-third of the respondents (31.88 percent) were found to receive relief distributed by GAs and NGOsfor their survival after flood. Data indicate that respondents of small income (31.85 percent) and middle income households (33.77 percent) were comparatively more likely to receive relief than high-income household (29.51).However, slightly less than one-third of the respondents (31.37 percent) opined that they borrowed cash money or material from non-institutional sources such as relatives or friendsto survive. They borrowed cash money from their relatives or friends with no interest, especially from those who lived in other villages and were not affectedby flood. They also borrowed from NGOs (19.36 percent) with low interest and from moneylenders (14.22 percent) with high interest rate at 5.00 percent per month that made them further vulnerable to the situation. Khasru (a 55-year-old farmer of *Chinaduli*) said:

"It was very difficult to continue daily lives after flood due to financial crisis. Flood destroyed almost everything of my household. It was not possible for me to collect relief because of my social status. So I borrowed money from a moneylender of Islampur Bazaar with high interest rate"

However, it is a matter of irony that a few of the respondents (1.96 percent) mentioned that they were compelled to sell land for their survival after flood. Anda few of the respondents (0.98 percent) kept their land mortgaged to collect money.

8.11 Changing Occupation as an Adaptation Strategy

It was found in chapter seven and earlier as well as in some previous studies (Bilo, 2013; Islam et al., 2012; Khandker, 2007; Paul & Routray, 2010) that flood createdsevere economic crisis among the flood victims. Consequently, some people change their occupation to overcome the economic crisis (Codjoe, Atidoh & Burkett, 2011; Paul & Routray, 2010). The situation of the study area was no different in case of changing occupation after flood. Some of them (40.44) were compelled to do other jobs apart from their main occupation for their survival after flood that had close link with location of the study area (Table 8.16).

Table 8.16: Opinion on Changing Occupation after Flood by Study Villages

Whether changed occupation	Name of the Village		Total
	Ajogara	Chinaduli	
Changed	123 (60.29)	42 (20.59)	165 (40.44)
Didn't change	82(39.71)	162 (79.41)	243 (59.56)
Total	**204 (100)**	**204 (100)**	**408 (100)**

Pearson Chi-Square: 66.764, df 1, Sig. value .000, Phi .405. Percentage has been shown in parenthesis.

Table 8.16 shows that majority of the respondents (60.29 percent) of *Ajogara*did other works apart from their main occupation for earning money to cope with post-flood situation. On the contrary, a small number of the respondents of *Chinaduli* (20.59 percent) changed their occupation to cope with post-flood situation, that is,doing other jobs apart from their main occupation was significantly higher among *Ajogara* people

than that of *Chinaduli*, χ^2 (1, *N*=408) =66.764, *p*<.001. However, the study also examined the relationship between sex of the respondents and doing other jobs. It is found that changing occupation, that is doing other jobs, had significant association with sex of the respondents (Table 8.17). The prevalence of changing occupation was found significantly higher among men than women, χ^2 (1, *N*=408) =5.383, *p*=.020. It might be due to the bread-winner status of men. Men are responsible for bearing the expenses of a household in Bangladesh society. Thus, they have to do various types of job at crisis moments.

Table 8.17: Relationship of Changing Occupation with Sex of the Respondent

Whether changed occupation	**Sex**		**Total Number (%)**
	Male Number (%)	**Female Number (%)**	
Changed	94 (46.08)	71 (34.80)	165 (40.44)
Didn't change	110 (53.92)	133 (65.20)	243 (59.56)
Total	**204 (100)**	**204 (100)**	**408 (100)**

Pearson Chi Square: 5.383, df 1, Sig. value .020, Phi-.115.

Table 8.18: Relationship of Changing Occupation with Household Category by Sex

Opinion on changing occupation	Sex of the Respondents						Total
	Household Category of Men			Household Category of Women			
	Small income	Middle income	Higher income	Small income	Middle income	Higher income	
Changed	68 (50.37)	17 (45.94)	9 (28.13)	55 (40.74)	14 (35.00)	2 (6.90)	165 (40.44)
Didn't change	67 (49.63)	20 (54.06)	23 (71.87)	80 (59.26)	26 (65.00)	27 (93.10)	243 (59.56)
Total	135 (100)	37 (100)	32 (100)	135 (100)	40 (100)	29 (100)	408 (100)

Men: Pearson Chi-Square: 5.152, df 2, Sig. value .076, Cramer's V .159.
Women: Pearson Chi-Square: 12.051, df 2, Sig. value .002 Cramer's V .243.
Percentage has been shown in parenthesis.

However, data also indicate that doing other jobs, except main occupation, was related to the level of household income of the respondents. Table 8.18 shows that slightly more than half of the men (50.37 percent) of small-income household temporarily changed their occupation. On the other hand, less than half of the men (45.94percent) of middle-

income household and only 28.13 percent men of high-income household changed their occupation, that is, changing occupation was greater among the men of small-income group than that of middle and higher-income groups although it was not significant,χ^2 (2, *N*=204) =5.152, *p*=.076. In contrast, doing other jobs apart from their main occupation by women was significantly associated with the level of their household income.Prevalence of doing other jobs was found higher among the women of small-income household (40.74 percent) than that of middle-income (35.00 percent) and higher-income (6.90 percent) household, χ^2 (2, *N*=204) =12.051, *p*=.002. It should be mentioned that women did additional works along with doing their regular household chores.

8.11.1 Types of Works Done by Flood Victims Apart from Main Occupation

The flood victims did various types of works after flood to adapt to the situation evolved because of flood. Out of the total male respondents, who did other works apart from main occupation, 39.36 percent were found to work as agriculture laborer, of whom 48.53 percent were from small-income households, 17.65 percent were from middle-income and 11.11 percent were from high-income households (Table 8.19). More than one-quarter of them (28.72 percent) were found to catch fishes as means of livelihood of which most of them (36.76 percent) were from small-income households, 5.88 percent and 11.11 percent were from middle-income and high-income households respectively. However, the same portion of the male respondents (28.72 percent) from all categories (small-income 26.47 percent, middle-income 41.18 percent and high-income households 22.22 percent) worked as labor of earth cutting. One of male respondents of *Chinaduli* (Quddus, a 45-year-old owner of a small-farm) said:

"Most of the crops my land was destroyed by flood. I had to suffer from financial crisis. So I worked as labor of earth cutting to continue my livelihood and study of my children."

Some of them worked under Food for Work programs (13.83 percent) and as construction laborer (10.64 percent) and some of them run small business (small shop, mobile shop at market/bazaar and as hawker). However, women of the study area did almost the same works done by men. In addition, some of them worked as maid servant (30.99 percent). But none of the women of high-income household category did this job. On the other hand, 32.73 percent women of small-income household and 28.57 percent of middle-income household did this job. Rokeya (a 43-year-old housewife of *Chinaduli*) replied:

"I worked as maid servant after flood. I got two meals and 50 Tk. per day. Without this work I would have to pass the day without meal."

Table 8.19: Types of Works done by Respondents to Adapt to Post-flood Situation

Types of Works *	Sex of the Respondents							
	**Household Category of Male				Household Category of Female			
	Small income (n=68)	Middle income (n=17)	High income (n=9)	Total (n=94)	Small income n=55)	Middle income (n=14)	High income (n=2)	Total (n=71)
Food for work	9 (13.24)	4 (23.52)	0 (0)	13 (13.83)	5 (9.09)	1 (7.14)	1 (50.00)	7 (9.86)
Agricultural labor	33 (48.53)	3 (17.65)	1 (11.11)	37 (39.36)	11 (20.00)	2 (14.29)	0 (0)	13 (18.31)
Construction labor	4 (5.88)	3 (17.65)	3 (33.33)	10 (10.64)	-	-	-	-
Maid servant	-	-	-	-	18 (32.73)	4 (28.57)	0 (0)	22 (30.99)
Earth cutting	18 (26.47)	7 (41.18)	2 (22.22)	27 (28.72)	29 (52.73)	7 (50.00)	0 (0)	36 (50.70)
Catching fish	25 (36.76)	1 (5.88)	1 (11.11)	27 (28.72)	4 (7.27)	2 (14.29)	0 (0)	6 (8.45)
Small business	5 (7.35)	1 (5.88)	2 (22.22)	8 (8.51)	1 (1.81)	1 (7.14)	2 (100)	4 (5.63)
Others	1 (1.47)	0 (0)	0 (0)	1 (1.06)	1 (1.81)	1 (4.17)	0 (0)	2 (2.82)

Figures in parenthesis show percentage. *More than one job was done by the respondents.

Among the women who did other works apart from main occupation, most of them (50.70 percent) were found to work as labor of earth cutting. About 53 percent women of small-income and 50.00 of middle-income household were found to do this work for their survival. One of female respondents of *Ajogara* (Jhunu, a 35-year-old housewife) said:

"I had to suffer from food crisis after flood. I worked as laborer of earth cutting for surviving with my children."

Some of them (18.31 percent) worked as agricultural labor. They worked especially in vegetable fields although a few of them worked in paddy field too. They also worked under food for work program (9.86 percent), caught fishes (8.45 percent), run small business (5.63 percent) and did other jobs e.g. spinning thread (2.82 percent) in hand made machine.

8.12 Ownership of Assets Sold

The sale of assets is a widespread strategy to combat the crisis situation. Some assets such as poultry, livestock, jewelry and others are sold to overcome the financial crisis crated by flood (Begum, 1995). The situation was no different in the study area.About one-third of the respondents (32.11 percent) were found to sell their valuable goods for adaptation to the post-flood situation. The respondents were enquired to know about the owners of the assets that were sold. In response to this question, majority of the respondents (56.49), among those who sold valuable assets to cope with post-flood situation, replied that the assets belonged to common ownership of their family. Neither husband nor wife was the absolute owner of the resources. They believe that all the family members are owners of the household resources. Hence, who is the owner of the assets is not pertinent here that contrasts with the findings of Begum's study (1995), where she found most of the assets belonged to women that were sold to cope with flood. Nonetheless, a considerable number of the respondents (35.11 percent) replied that male members of the family were the owners of the resources. And a few of them (8.40 percent) stated that the resources belonged to female members of the family (Table 8.20).

Table 8.20: Ownership of the Resources Sold after Flood

Ownership of the resources	Responses of Male		Responses of Female		Total	
	number	percent	number	percent	number	percent
Wife alone	2	4.26	9	10.71	11	8.40
Husband alone	12	25.53	34	40.48	46	35.11
Jointly	33	70.21	41	48.81	74	56.49
Total	47	100	84	100	131	100

8.13 Decision-making in Recovering

Like in other patriarchal countries, male dominance over women still exists in rural Bangladesh. Male superiority is accepted as part of the social norms. Male members of the family absolutely dominate the decision-making process related to household and extra-household affairs (Sultana, 2010). Even they are not likely to discuss the matter with women (Begum, 1995). But a little different situation was found in the study area.It is found that majority of the women (57.35 percent), compared to 44.12 percent men, took their post-flood adaptation decisions jointly with husbands. On the other hand, one-

third of both women (33.33 percent) and men (31.37 percent) reported that all family members took their decisions together for adaptation. However, information given by one-quarter of the male (24.51 percent), compared to 8.33 percent of the female respondents, it is known that husbands (or male members of the family) made the adaptation decisions alone.In contrast, only 0.98 percent women reported that they took the decisionalone related to adaptationthat was confined to repairing their houses and cleaning surroundings of their courtyard. But none of the men reported that women took the decision alone related to adaptation that indicates women's powerless position at household level in terms of decision-making authority.

Table 8.21: Decision-maker after Post-flood Situation

Sex of the respondents	Decision maker	Ajogara	Chinaduli	Total
Male	Husband alone	8 (7.84)	42 (41.18	50 (24.51)
	Wife alone	0 (0)	0(0)	0 (0)
	Husband-wife jointly	50 (49.02)	40 (39.22)	90 (44.12)
	All family members	44 (43.14)	20 (1961)	64 (31.37)
	Total	102 (100)	102 (100)	204 (100)
Female	Husband alone	4 (3.92)	13 (12.75)	17 (8.33)
	Wife alone	2 (1.96)	0 (0)	2 (0.98)
	Husband-wife jointly	59 (57.84)	58 (56.86)	117 (57.35)
	All family members	37 (36.27)	31 (30.39)	68 (33.33)
	Total	102 (100)	102 (100)	204 (100)

Figure in parenthesis shows percentage.

It is important to mention that a contrasting situation was found between the two study villages with regard to making adaptation decision. It appeared that a significant number of men (41.18 percent) of *Chinaduli* took their adaptation decision alone, while the percentage in *Ajogara* was only 7.84 (Table 8.21).Even they did not ask their wives about it, rather they imposed decision on them. On the other hand, two women of *Ajogara* were found to make decisions alone, but none of the women was found in *Chinaduli* who made adaptation decisions alone that indicates to more vulnerable position of *Chinaduli* women than that of *Ajogara* in terms of decision-making power.

8.14 Reason for not Taking Women's Opinion in Decision-making

The respondents, who said that husbands took adaptation-decision alone, were asked why the opinion of women was not sought in the decision-making process. Most of the male respondents (86.00 percent) replied that men were enough to make decision alone.No need to take opinion of women. They replied that decision-making is not the work of women (18.00 percent). They believe that women's work is to implementthe decisions made by their male partners (18.00). Besides this, they believe that women are not able to make decision.Some of the women respondents (29.41 percent) also believed that men were enough to make appropriate decision for adaptation. So, they had no need to take their opinion. On the contrary, a significant number of women (52.82 percent) believed that their husbands did not seek their opinion in the fear of losing leadership and control over them (47.06 percent). Actually, male members of rural Bangladesh are not in a position yet to accept women's leadership at household level. Rather they would like to suppress women's leadership (17.65 percent) that is why they did not take women's opinion in decision-making process (Table 8.22). Wholes the circumstances stated above indicated a patriarchal norm system, where women are socially believed to be inferior to men and this excluded women's access to decision-making regarding flood management.

Table 8.22: Reasons for not Taking Opinion of Women in Decision-making

Sex of the respondents	Reasons	Ajogara (N=8)	Chinaduli (N=42)	Total (N=50)
Male	Men are enough to make decision	4 (50.00)	39 (92.86)	43 (86.00)
	It is not women's work	1 (12.25)	8 (19.05)	9 (18.00)
	Women will implement decision	2 (25.00)	7 (16.67)	9 (18.00)
	Women could not make decision	1 (12.50)	6 (14.29)	7 (14.00)
Female	Reasons	Ajogara (N=4)	Chinaduli (N=13)	Total (N=17)
	Men are enough to make decision	2 (50.00)	3 (23.08)	5 (29.41)
	Men's control will be reduced	2 (50.00)	6 (46.17)	8 (47.06)
	Men don't want to lose leadership	2 (50.00)	8 (61.54)	10 (58.82)
	To suppress women leadership	1 (25.00)	2 (15.38)	3 (17.65)

Figures in parenthesis show percentage. More than one answer has been accepted.

8.15 Summary and Conclusion

This chapter discusses the post-flood situation in the study area and adaptation strategies adopted by the affected people. It also analyzes the nature of GA-NGO assistance provided to the affected people to recover from flood-induced crisis. The findings show that sufferings of the people in the study area continued in the months immediately after floods. The people were found to suffer from severe food crisis, lack of habitable shelter, sanitation facilities, pure drinking water, health services, educational facilities and problem of movement and cooking that hindered their regular livelihood process. Consequently, stakeholders of the affected community were found to play their respective roles to get back to normal livelihood process. The GA-NGO were found to provide material and non-material support services to the flood victims, although their contribution was not up to the desired level of flood victims. Especially women's problems were not addressed adequately.

However, individual households were also found to adopt a variety of adaptation strategies to get back to normal life. It started with repairing the damaged house, sources of water, cleaning the surroundings and looking for income-earning activities. Apart from this, the people of the study area were found to adopt a series of tactics to adapt to the prevailing situation that include receiving assistance of and borrowing from non-institutional sources such as relatives, friends, neighbors; receiving relief, changing occupation i.e. doing other jobs apart from main occupation, selling household assets and so on. However, adopting adaptation strategies was found to be associated with location of the study area, household income, and sex of the respondents. But it is important to mention that although women participated in different activities for recovering from crisis situation, their participation, especially in decision-making process, was found to be influenced by gender hierarchy. Despite the commendable contribution of women to post-flood adaptation, still they are neglected in decision-making process at household level because of the prevalent gendered norms and values of patriarchy.

Chapter IX
Summary of the Findings, Recommendationsand Conclusion

9.1 Introduction

This chapter presents the major findings of the study. It also attempts to make connection between the findings and theoretical notion of the theories employed in this study. It discusses the findings and analyzes whether these findings support the assumptions placed in chapter one. It also recommends some measure to strengthen CBDM on the basis of findings. Finally, it presents a conclusion at the end.

9.2 Summary of the Findings

The broad-spectrum of the study was to analyze gender issuesin disaster management practices embedded in rural Bangladesh by emphasizing philosophical notion of CBDM. The findings of the study indicate that natural disasters, like flood, are being managed at community level with some exceptions. Data show that government agencies (GAs) and non-government organizations (NGOs) and people in the flood-affected community follow structural and non-structural practices to combat flood. GAs have constructed various types of infrastructure such as bridges, culverts and *kancha* roads to prevent flood as preparedness activities. Some measures were also taken to repair infrastructure before the last flood, but people's participation was found very low at community level in preparedness phase that is in contrast with the findings of Juthi (2003), where she found spontaneous participation of people in draining out the stagnant water.

With regard to non-structural practices, data show that GAs andNGOs, as well as people at household level, adopt a variety of steps to combat flood. Disaster management committees at grass-root level, that is, at the Union and *Upazila* level, have been formed although meetings of these committees are held hardly. None of the members could tell about when the last meeting of the union disaster management committee was held and what had been discussed there that contrasts with the notion of Alternative Perspective and internalized goals of CBDM**.** Members of the Union Disaster Management Committee also claimed that they prepared disaster management plans to combat floods, but no clear-cut plan was found in any of the Union *Parishads*. But the UP provided some

services as their non-structural disaster mitigation efforts for better preparedness at community level apart from forming committee and adopting plan.

The GAs such aslocal government (LG – Union *Parishad*),BRDB and Social Service Office and NGOs viz. *Manobmukti Sangstha, Souhardo*, National Development Program, Eco-Social Development Organization (ESDO) provided various types of services in preparedness phase that include providing training, creating awareness, transferring cash money and technology to enhance the preparedness of the people of the study area.But widespread participation of the people was not found in training and awareness building activities. Only 41.51 percent men and 40.00 percent women were found to receive the training.The study finds moderate relationship of the age structure and organizational involvement of women with their participation in training programs. Relationship of women's participation was also found with their level of education, but it was not significant, that indicates the relevance of using Socioeconomic Background Perspective of Empowerment Theory in the present study to analyze findings. However, a variety of reasons were found responsible for not attending training programs. But the reasons differ from men to women. Men could not attend the training programs mainly due to lack of information about arranging training programs and stress of work, while most of the womencould not attend the training program because of religious and social restrictions.

With regard to building awareness among the people of the flood-prone area, the study finds that both GAs and NGOs created awareness among the villagers about the importance of preserving dry food for consumption during flood, drinking pure water,preserving seed,taking treatment in due time,eating nutritiousfood;necessity of taking care of children and elder people, necessity of taking care of livestock,importance of cleanliness, andwhat should be done during and after flood. GAs and NGOs operated awareness-building activities through community meeting, group discussion,training program;distributing leaflet and poster; showingstreet drama and short-film,announcement through microphone and loudspeaker. Althoughmajority of the men(58.70 percent) were found to attend the awareness-building program, women's participation was found very negligible (27.8 percent). Like participation in training programs, women's participation in awareness-building programs was also associated with their age structure and involvement with organizations. However, majority of the wives of the male respondents as well as female respondents did not participate in any

awareness-building programs because of religious restriction, stress of work and society-imposed and men's restrictions that indicates patriarchal dominance, that is, prevalent gendered norms affect the behavior and movement of women. The findings conform to those of Farzana et al. (2004) and justify the relevance of using Ecofeminism theory in this study. On the other hand, some of the men (17.71 percent)believed that women had no need to participate in awareness-building programs as they (men) were aware and experienced enough regarding flood management.A few of them also believed thatawareness-building programs had no usefulness to them, that is why they did not participate in these programs.

In respect of preparedness strategies/mechanisms at household level, the study reveals thatthe people of the study area took a number of measures before flood as preparedness strategy/mechanism, so that they could protect their resources and properties from the deluge and continue their livelihood in spite of difficulties created by flood. The strategies were: raising plinth of homestead,preserving food and fuel for crisis period,setting tube-well in high place, raising floor of the house, preserving seed in safe places, preserving cattle-food, moving houses to upper place, making walls of the house with materials other than mud,raising bank of pond, enclosing bank of pond by nets,cultivating flood-tolerant crops,and others (saving money, teaching children how to swim).

It appears that women play a pivotal role in various types of activities in pre-disaster (pre-flood) stage for better preparedness. They were found to preserve food for consuming during flood, fuel for using during crisis period and fodder for cattle, raising the plinth of homestead,floor of the housesand bank of the pond. They were also found to assist their male counterparts in other works such as in moving houses to upper places, setting latrines and so on, but none of the men were found to assist their female counterparts because of holding strong gender ideology that complies with the findings of Begum (1995). However, many women were also found to perform additional roles that were related to their gender specific roles, e.g. preparing dry food, dung-cake, making moveable oven etc. But they were found to enjoy limited power to make decisions alone, although most of them had participation in decision-making process. Because of strong patriarchal attitude most of the men did not accept women's opinion in making decision that complies with the findings of Begum (1995) and Farzana et al. (2004).

However, social bondage and cohesion still exist in rural Bangladesh, although there are some changes that took place in recent past. The study finds cooperative attitude of rural community in rescuing marooned people during catastrophe. Both neighbors and relatives were found to extend their supports to flood victims that conform to Nahar's (2001) study. As per the opinion of the respondents, they came to rescue the flood victims, offer lodging, food, medicine and other support services. But some of the respondents alleged that because of various reasons such as domestic sufferings, poverty, loosing social bondage and weakening destroying beneficial attitude their neighbors did not extend their cooperation**.**

The study finds that flood victims were encountered with various kinds of problems such as shortage of food, fuel, problems of movement, scarcity of pure drinking water, illness, problems of keeping livestock, lack of shelter, scarcity of cattle food, problem of defecation, lack of employment,scarcity of baby-food,fear of snake-biting, disturbance of mosquito, environment pollution, problem of schooling (absence in school), absence in work, increase in stealing, loss of fishes, fear of drowning, and damage of growing crops that also create crisis after flood. Other researchers (Bilo, 2013; CCC, 2009; Farzana et al. 2004) also found the flood victims' experience of these kinds of problems. However, both GAs (especially the UP) and NGOs provided a variety of services such as distributing food grains,medicine, oral saline, drinking water,cooked food, and water purifying tablet; providing necessary information related to hygiene and health, assisting in going to safe place, arranging shelter and providing other materials, e.g. candle, dietary biscuit etc. But some of the respondents alleged that they did not get GA-NGO assistance during flood that conforms to the findings of Bilo (2013); Khuda and Nizamuddin (2000).

With regard to coping mechanism, the flood victims were found to adopt diverse types of indigenous mechanism at household level to cope with catastrophic situation evolved due to flood. the mechanisms were: repairing house, collecting water from distance, consuming 'sub-standard' food, borrowing, using boats or rafts (made of banana trees) for movement, purifying water by tablet/by boiling,preserving fuel for using during calamity, receiving relief, searchingfor alternative works, taking shelter in safer place, using alternative baby food, remaining awake at night, keeping vigil jointly, paying attention to children, using makeshift unhygienic system for defecation. Other researchers (Begum, 1995; Bilo, 2013; Farzana et al., 2004; Morshed, 2007; Nino, Smith & Roy, 2004) also

found flood exposes people to the task of adopting more or less the same kinds of mechanisms to cope with the disaster. The findings also show that coping mechanism was associated with household income, landownership, level of education and sex of the respondents which also justifies the rationale of using Socioeconomic BackgroundPerspective of Empowerment Theory in this study. It appears that borrowing was found higher among the small-income and landless households and illiterate people. On the other hand, purifying water was found higher among the high-income and large-farm households and educated people. In contrast, eating sub-standard food was found higher among small-income and landless households and illiterate people. However, more women were found to be involved in collecting water from distant sources, purifying water by boiling or by using water purification tablets, eating sub-standard food and collecting fuel compared to men thatindicates existence of gender division of labor in the study villages that also complies with the findings of BCAS (2010); Begum (1995); and Bilo (2013).

It appears that women faced various types of problem that were different in nature from men's and related to their traditional gender-specific roles and physical condition. The problems experienced by women were: problem in cooking, collecting fueland pure drinking water,defecation of both adult women and children, maintaining *purdah*, problem of safety/feeling insecure, managing reproductive health and too much stress of work and other problems (collecting rice or other food items, drying paddy etc.). GAs distributed food grains, water purification tablets, pure drinking water, and medicine under test-relief operation in emergency phase to assist women in combating the problem evolved due to flood.On the other hand, services provided by NGOs were supplying drinking water, water purifying tablet, cooked food, fuel, health services and materials for managing menstruation to address special types of problems experienced by women. But a significant number of the respondents alleged that both GAs and NGOs did not provide services to address problems of women.

Data show that women of the study area adopteda variety of mechanismsin accordance with the nature of problems to combat flood situation. They were found to collect water from distant sources, preserve fuel (dry wood, straw, cow-dung etc.) for using in emergency period, use unhygienic sanitation system, reduce amount of food intake and number of meals, and consume less preferred and cheap food items. However, both men

and womenwere found to playmultifarious roles during flood to combat the situation. The important roles played by men were making platform, repairing houses, preserving valuable goods, raising bed, taking shelter, protecting children and elders, feeding the cattle, collecting food, medicine and fodder. On the other hand, women played a pivotal role incollecting and preparing food; looking after children, elders and ill people; collecting water, fuel and fodder, preserving dry food, seed and fuel; taking care of livestock and poultry, preserving seed, and feeding the livestock.It is important to mention that roles performed by women such as preparing food; collecting water, food and fuel; looking after children, elderly and sick people are socially viewed as women's role by gendered norms of a patriarchal society like that in Bangladesh. But they also did some additional works such as taking care of livestock, collecting fodder, and feeding the livestock that are traditionally considered as roles of men.

It is found that most of the respondents were compelled to leave their residence due to over-flood and some of them stayed at their residences. They took shelter at neighbors' house, relatives' residences, academic institutions, on flood control dams, on elevated roadsthatwas a little far from their residences. Findings show that women were more likely to take shelter at neighbors' house rather than at academic institutions or on flood control dams considering the matter of maintaining *purdah* and sanitation facilities. But some of the men took shelter at academic institutions and on flood control dams as maintaining *purdah* was not a matter of concern for them.

In respect of public health situation, the majority of the respondents were found to suffer from various types of diseasesduring flood. The highest number of the respondents was found to suffer fromdiarrhea (79.66 percent) followed by fever (67.40). Other diseases that became health concern for the people were dysentery, fever, skin disease, cough, headache, jaundice etc. Various measures were put in place for the treatment of the above-mentioned diseases such as buying medicine on physicians' advice, only buying medicine without physicians' advice, taking advice of homeopathic doctors and using herbal medicinal plants.It is worth mentioning that 6.37 percent men and 11.76 percent women reported that no initiative was taken for the treatment of women in case of their illness. In contrast, only 1.96 percent men and 0.98 percent women mentioned that no initiative was taken for the treatment of men.

With regard to special health services for women, the large majority of the respondents (86.52 percent) alleged that GAs provided no special health services for women.Some key informants (women members of the UP) also admitted that it was not possible to provide special services for women, because they had to think of mass problems in general such as shortage of food, drinking water, medicine etc. But women were under the purview of these services. On the other hand, some key informants (UP chairmen and members) claimed that they opened temporary health centers in the flood affected area during flood. Similarly, a few of the respondents reported that GAs provided women with some special health services during flood. However, almost the same responses were found that showed providing special health services for women by NGOs. The large majority of the respondents (83.58 percent) replied in the negative in response to the question whether special health services were provided for women by NGOs.

In connection with post-flood situation, the people of the study area were found to suffer from various types of problems after flood that includefood crisis, illness, lack of shelter, financial crisis, lack of sanitation facilities, lack of health services, scarcity of drinking water, lack of fuel, problem of cooking, lack of employment, lack of agricultural inputs and so on. Both men and womenwere found to concentrate onvarious kinds of jobs after floods to overcome the post-flood catastrophe as well as to get back to normal life. But their roles were influenced by prevalent gendered norms. For example, men set the new poles in the house, surrounded the house by fences, and repaired the roof. On the other hand, women repaired the floor of the house, washed the floor, and assisted in men's works. It is obvious that though both men and women played vital roles after flood, women had to play double roles for adaptation. In addition, data indicate that men were more likely to hire labor to repair their damaged house. On the other hand, women were more likely to do their jobs by themselves and helping each other.

BothGAs and NGOs provided some services to rebuild the community as well as assist the individual households to restart their livelihood process. But a significant difference was found between the prevalence of services based on location of the study villages. The prevalence of services provided by both GAs and NGOs was found higher in *Chinaduli* (mainland) than in *Ajogara* (isolated from mainland). Besides, it is worth mentioning that more than one-quarter and more than one-fifth of respondents alleged that GAs and NGOs did not provide the flood-affected people with services at all for post-flood

adaptation. However, both GA and NGO authorities claimed that they paid attention to fulfill the needs of the women after flood but a significant number of the sample women (39.24 percent) alleged that did not receive any service from GAs. On the other hand, although majority of the sample women (61.76 percent) were found to receive government services after flood, the prevalence of services was found higher in *Chinaduli* than in *Ajogara*. Like the assistance of GAs, more than two-thirds of the sample women (67.65 percent) were found to receive NGO supports, but prevalence of support services was found higher in *Chinaduli* than in *Ajogara.* Among other services, provided by GA-NGO, medical check-up, distribution of medicine, food grains, and reproductive health services were remarkable.

In respect of adaptation, flood-affected people in the study area were found to adopt a mixture of tactics, apart from receiving GA-NGO supports, in accordance with the degree of flood-induced problemsfor the better adaptation to post-flood situation.It is found that the main problem of the flood victims was financial crisis. It (financial crisis) deteriorated as they had to spend from savings, face unemployment, and spend for medication and so on. Because of pecuniary hardship, they had to depend on receiving relief, assistance of relatives, neighbors, or friends. They were also found to change occupation, borrow from non-institutional sources such as relatives, neighbors or moneylenders; sell valuable goods and arable land that were also found in other studies (Morshed, 2007; Nino, Smith & Roy, 2004; Siddika, 2008).

However, the study finds close association of adaptation mechanisms/strategies with household income, location of the study area and sex of the respondents. The prevalence of changing occupation was found higher among the respondents of small-income households than that of middle-income and high-income households. On the other hand,selling valuable assets as adaptation strategy was found higher among the high-income households than with middle-income and small-income households. However, changing occupation was significantly higher among *Ajogara* people than *Chinaduli*.In addition, a significant association was also found between changing occupation and sex of the respondents. The prevalence of changing occupation was found significantly higher among men than with women.It might be due to breadwinner status of men. Traditionally, men are responsible for bearing the expenses of a household in Bangladeshsociety. Thus,

they have to do various types of jobs in crisis moment and the study area was no exception to this.

With regard to decision-making process, it is found that majority of the women (57.35 percent), compared to 44.12 percent of men took their post-flood adaptation decisions jointly(husband-wife). On the other hand, one-third of both women (33.33 percent) and men (31.37 percent) reported that all family members took their decisions together for adaptation. However, according to information given by one-quarter of men (24.51 percent), compared to 8.33 percent of women, it is known that husbands (or male members of the family) made the adaptation decisions alone.In contrast, only 0.98 percent women reported that they took the decisionalone related to adaptationthat was confined within repairing their houses and cleaning surroundings of their courtyards. But none of the men reported that women took the decision alone related to adaptation, which reflects women's powerless position at household level in terms of decision-making power that complies with the findings of CCC (2009). Therefore, the study concluded that patriarchal system existed in the study area, where women are socially believed to be inferior to men and this excluded women's access to decision-making regarding flood management.

However, the findings indicate that people of the flood-affected area are, in general, encountered with various types of problems. But the problems experienced by women are different in nature than that of men. For example, both men and women were found to experience some problems such as shortage of food, scarcity of drinking water, illness, problem of movement etc. But women were found to face some unique types of problems that were related to their gender-specific roles in view of patriarchy. For example, women were found to face problem in collecting water and fuel; preparing food, and feeling insecure. Consequently, both men and women adopted some measures to survive the flood. But women's participation in disaster management activities, especially in training, awareness-building program and decision-making process, is constrained by prevalent gendered norms. The findings further indicate that their participation is also influenced by socioeconomic factors.

9.3 Examining the Assumptions of the Study

We have five assumptions in the study which are examined below:

Assumption-1: The first assumption of this study was ***GA-NGO collaboration is an attempt to shift disaster management paradigm from conventional emergency response to disaster risk management***, where collaboration is considered as a partnership of parties rooted in the acceptance of their shared vision and responsibilities for the delivery of social services for the attainment of common goals within policy and legislative frameworks governing a country's response to its social needs and problems (Hasan, 2011). However, it is found that the GoB has prepared its draft Disaster Management Policy, National Plan for Disaster Management 2010-2015 and Standing Order on Disaster, and formed institutional framework embracing the philosophical notion of Alternative Perspective and Hyugo Framework for Disaster Management (DMB, 2008, 2010 & 2010a). The government has also introduced comprehensive disaster management program (CDMP) for mainstreaming disaster management in development plans and programs. CDMP is participation oriented 'bottom-up' approach where enormous emphasis has been given on empowering at-risk people, their participation, capacity building as well as promoting livelihoodof the disaster-prone community in accordance with the philosophy of Alternative Perspective. Emphasis has also been given on collaboration of GA, NGO and other stakeholders at every level, i.e., from local level to national level, of disaster management. This study investigated whether the vision entrenched in institutional mechanism of disaster management is being implemented.

Findings show that GAs and NGOs took a variety of structural and non-structural measures to combat flood. The government agencies constructed some physical infrastructure to prevent sudden flood and repaired those infrastructure before flood as their preparedness activities. NGOs were also found to repair damaged roads. In addition, NGOs provided the flood-affected people with financial assistance to raise the plinth of their homesteads along with other support services under partnership program with the government (the UP) and DFID. However, NGOs were also found to play important role in Union Disaster Management Committee as a segment of the members of the committee as well as stakeholders of the community. GAs and NGOs also provided the flood-affected people with necessary services (e.g. training, conscientization development etc.) for their empowerment so that they could make appropriate decision to combat flood situation which indicates the relevance of using Alternative Perspective. Their activities were not confined to emergency response to flood through distributing relief items.

Rather the GAs (the UP, LGED, DPHE, MoHFW) and NGOs provided the flood victims with material and non-material services for their empowerment and better preparedness. They also mobilized resources through providing credit facilities and transferring modern technology. Moreover, GAs and NGOs were found to continue their service during and after flood for adaptation that indicates the GA-NGO collaboration/partnership in every phase of disaster management. But the services were confined within distributing relief items and repairing *kancha* roads and other infrastructure. But none of the organizations were found to organize the affected community and assess the needs, strength and weakness of the community for adopting a risk management plan for better adaptation of flood victims. Hence, the findings indicate that GA-NGO collaboration in Bangladesh has not yet achieved the goal of shifting disaster management paradigm from conventional emergency response to disaster risk management, but it is on way to attaining the defined goal.

Assumption 2: The second assumption of this study was:***Indigenous mechanisms still playing leading role in managing natural disasters, especially flood, in rural Bangladesh.*** Data show that GAs, NGOs and individual households took a variety of structural (discussed earlier) and non-structural measures to combat flood. Although GAs and NGOs took some non-structural measures such as providing training and creating awareness among the villagers to enhance their capacity so that they could cope with flooding and adapt to the post-flood situation effectively, people's participation was found very negligible in those programs. On the other hand, individual households were found to take some structural and non-structural measures to face flood situation. However, both GAs and NGOs provided the flood victims with financial and other support services during and after flood. But some of the respondents (about one-third) alleged that they did not get required services during and after flood and women's needs were not addressed adequately. But the flood victims in the study villages were found to cope with flood and adapt to the post-flood situation by adopting indigenous mechanisms as they were experienced enough in living with flooding. Although majority of the flood-affected people in the study area received GA-NGO support services, finally they were found to follow indigenous strategies such as selling assets, receiving assistance from friends, relatives and neighbors, borrowing from non-institutional sources, changing eating behavior and occupation and so on that supports the assumption.

Assumption-3: The third assumption of this study was ***rural womenof Bangladeshstill hold subordinate position with regard to participation in decision-making process***. The study finds that a few of the sample women had their own income and landownership that indicates their vulnerable condition at household level. On the other hand, majority of the women had ownership of other resources such as cow, milch-cow, goat, hen, duck, gold, silver etc. but they were found to enjoy limited power to make decisions independently to use these resources. Only a few of the women were found to exercise power to make decisions alone regarding using these resources that were confined to selling petty things such as eggs, poultry, or lending rice, lentils, onions etc. In contrast, a significant number of men were found to make decisions alone in using women's resources. In addition, women's participation was found negligible in making decisions related to combating flood. Although in some cases, women were found to put their opinion, the final decision was made by men. The aforesaid situation indicates women's powerless and voiceless position that supports the assumption.

Assumption-4: The fourth assumption was ***patriarchal norms, values and other socioeconomic factors influence women's participation in disaster management activities***. The study finds that women had active participation in preparedness, emergency and recovery phases that increases their work-load during and after flood as they had to do more works. Although they took double burdens on their shoulders at every stage of disaster management, their participation was found very minimal in decision-making process. Reasons for less participation of women in decision-making process are embedded in the existing social structure of patriarchy. A substantial number of men and women believe that men are enough to make appropriate decisions in combating any situation. Hence, what is the necessity of seeking women's opinion in making decision? On the contrary, women complained that men did not allow their female counterparts to attend skill development programs and take women's opinion in decision-making process in the fear of losing control and authority over women. On the other hand, the findings indicate that social and religious rules-regulations restrict women's participation in training and awareness-building activities as per the opinion of a considerable number of both men and women. But it is worth mentioning that despite the social and religious restrictions, some women attended conscientization development programs and contributed to decision-making process and the study finds significant relationship of some factors such as age structure, household income and organizational

involvement with women's participation in the above-mentioned activities that supports the assumption.

Assumption 5: The fifth assumption was ***social transformation in terms of gendered ideology has occurred in rural Bangladesh.*** The study finds that despite performing a pivotal role in preparedness, emergency and recovery phases, women hadlittle control over resources and minimal participation in decision-making process and training and awareness-building programs. Reasons for less participation of women were embedded in the existing social structure of patriarchy. But a substantial number of men and women reported that although women had little power to make decision alone, they played commendable roles in decision-making process by giving opinions. Although final decision was made by men, women had a scope to put forward their opinions. It is one kind of change in social structure, as they were denied this opportunity earlier (Begum, 1995). However, the study also finds that despite the barriers that sprang from existing gendered norms, some of the women attended the training and awareness-building programs. Moreover, male respondents of the study villages recognized the valuable contribution of their female counterparts to every phase of disaster management that indicates the social transformation of power-based hierarchical relationshipmaking way for reciprocity and mutuality reflecting the anticipation of Ecofeminists (Howell, 1997:233), that is,the male members of the family and society do not simply dominate women by assigning additional work-load to them during and after disaster, rather they consider their active participation in every stage of disaster management.

9.4 Recommendations

The study was entrusted with analyzing gender issues in disaster management practices in rural Bangladesh. It studied the problems experienced by the people in the flood-affected areas during and after flood, their preparedness initiatives, emergency response, coping mechanism and adaptation strategies, and the prime factors structuring their responses with special reference to gender. It analyzed the aforementioned research issues on the basis of primary data collected from two flood-prone villages of *Siarjganj* and *Jamalpur* districts. The study finds that although natural disasters like floods are being managed at community level, still there are some limitations. The study reveals that there is lack of enough initiatives in preparedness, response and recovery phases, especially in addressing gender issues. Therefore, the study recommends the following steps for further

development of disaster management initiatives that are connected with structural and non-structural measures.

1) The study finds that there was no flood shelter in the study area. As a result many of the flood victims were compelled to stay on high platforms at their homestead. They had to also face problems in keeping poultry, livestock and other valuable goods. A good number of the respondents were compelled to take shelter on high roads along with poultry, livestock and other valuable goods. They were found to pass the emergency period undergoing various kinds of sufferings. Hence, community-based flood shelters should be constructed with available sanitation, water and other facilities for multiple uses. This shelter could be used during normal period as school or community center and its compound as a playground. It will be more beneficial to *Ajogara* as there was no primary school.
2) It is found through discussion with key informants that both of the Union *Parishads* formed disaster management committee, but meeting of the committee was hardlyheld. In addition, people's representatives (chairmen, members and women members of the UP) participated in UP meetings for adopting disaster management plan, and put their judgment. But the opinion of the masses related to their needs and problems was not incorporated in disaster management plan as the community meetings were not held for this purpose. The Union Disaster Management Committee, therefore, has to be active and regular meeting should be held to review the overall situation. In addition, community meetings should be called in every village before flood and public opinions should be incorporated in disaster management plans. Working procedure of Community Organization, one of the basic methods of Social Work, may be followed in this regard to assess wear and tear, needs and requirement, and strengths and weaknesses of the community.
3) Members of the Union Disaster Management Committee were found to have a narrow understanding about the philosophical notion of community-based disaster management, especially about the necessity and importance of people's participation. As a result, very often they ignore this issue. Therefore, this study recommends that chairmen and members of the UP and *upazila* disaster management committee and other stakeholders should be provided with proper training for enhancing their active participation.

4) With regard to household income, the study finds that monthly income of the large majority of the sample households of *Ajogara* and more than half of the *Chinaduli* was only up to BDT 4000/-. Their economic base was very fragile and fluctuates during flood. In addition, post-flood support service was found negligible. Thus, income generating activities should be expanded for the poor after flood. It might be 'food for work', that will create opportunity for immediate earning. Other activities may be poultry and livestock rearing under the supervision of livestock and agricultural extension department. In addition, the poor people must be provided with interest-free loan and/or non-recurring grant. On the other hand, those who have cultiviable land; should be provided with modern technology and agricultural advice along with agricultural inputs (seed, fertilizer, pesticides), so that they could recoup the loss properly within a short time.
5) With regard to household landownership, most of the people of the study area were found absolutely landless; therefore, the study recommends that government-owned land (*khasland*) should be distributed among the landless households, so that they could at least build their dwelling houses. In addition, the government can also introduce '*ekti bari ekti khamar'* project to enhance the livelihood process of the landless people living in disaster-prone areas.
6) The study finds that micro-credit services, provided by GAs and NGOs, were not available in the study villages. Both respondents and key informants confirmed that because of river erosion the people of the study villages became displaced frequently. The service providers could not locate them for collecting installments that created additional stress on them; consequently, they were not interested to distribute credit among the residents of the study area. Therefore, the government has to take the responsibility for their rehabilitation. Special financial packages may be offered by the government from its relief fund. It might be cash or in kind. Cash may be distributed as capital for expanding handicraft and cottage industry such as products of bamboo, cane, jute etc. Sewing machine and rickshaw and rickshaw-van may also be distributed among poor women and men respectively.
7) It is observed that flood frequently washes away valuable goods along with growing crops that create economic hardship of the affected people. Furthermore, the interviewees and participants of FGDs mentioned that occasionally educational equipment such as books, *khata*, pen, pencil etc. are not excluded

from being washed away. Sometimes, the equipment is destroyed in flood water too. But many people could not buy these materials due to economic hardship that severely hinders academic life of the students. Thus, the study suggests that educational materials should be distributed among the students after flood in order to enable them to continue their educational activities.

8) Severe river erosion was observed in the study area, especially in *Chinaduli*. Some of the respondents have already lost everything whatever was in their possession including dwelling houses. Therefore, appropriate measures have to be taken to protect them from river erosion. However, there were some *kancha* roads in both the villages near embankment of the river which also served as the 'flood control dam'. But these roads were too vulnerable to protect flash floods. Very often these roads broke down and the study area, especially *Ajogara,* got inundated suddenly. It also created problems in movement. Therefore, the study suggests that a heavy flood control dam should be constructed to protect these villages from being devoured by the river.

9) It is found that both men and women's participation in training and awareness-building programs was very negligible. Some of the women alleged that they were not informed earlier about training and awareness-building programs. Despite the willingness they could not attend these programs. In addition, social and religious restrictions constrained their participation. Therefore, the message of arranging training and awareness-building programs should be circulated adequately; appropriate religious interpretation and importance of women's participation in these programs should be disseminated through the mass media and informal communication among the people.

10) Although people of the study area were found to face some problems in general, women were found to face some additional problems during and after flood that were related to their traditional gender-specific activities such as collecting water, collecting fuel, cooking etc. that made them more vulnerable. Hence, cooked food, drinking water, water purification tablets etc. should be distributed adequately during flood to address the women's problems.

11) Women were also found to suffer from problems related to their health and reproductive health. Especially pregnant women could not move easily and go to the hospital for regular check-up. They also suffered from managing menstruation.

Although a considerable number of women of *Chinaduli* reported that they received some health services, women of *Ajogara* were found to be deprived of such types of services. Therefore, adequate health and reproductive health services should be provided to women, particularly those in *Ajogara*.

9.5 Areas of Further Studies

Although the present study analyzes different aspects of disaster management with special reference to flood and gender issues, it is not possible to cover all the aspects related to natural disasters and social scenario of gendered norms in a single research. Moreover, academic research demands suggestions for further study(s), therefore, the following areas may be viable in this respect.

i) The researchers may further undertake studies on wider aspects of natural disaster management such as gender perspective in coping with cyclone, drought, arsenicosisand so on.
ii) Studies may be undertaken on the coping strategy and livelihood process adopted throughout the year by the affected people.
iii) A study may be conducted on flood victims in urban areas of Bangladesh.

9.6 Conclusion

The present study put enormous efforts to discuss and analyze the gender issues in community-based disaster management. It attempted to identify gender-specific problems and coping strategy/mechanism of the affected people, explore the nature of services provided by GAs and NGOs to strengthening of bottom-up approach to disaster management and examine the influence of the prevalent gendered norms and other socioeconomic factors on women's participation in disaster management activities. The study proposes some mechanisms to enhance the resiliency and preparedness of the flood-prone areas from pro-poor and pro-women socioeconomic development interventions. Although the study has some limitations to integrate all the aspect of disaster management in relation to flood and gender, it might be a new stepping-stone in this kind of research endeavor. A new outlook is necessary to understand the research issue better and more comprehensively as well as to devise proper adaptation plans to address natural disasters and gender issues in the disaster-prone country like Bangladesh.

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Appendices

Appendix A

Interview schedule for collecting data from Male Respondents of a research project on
Gender Issues in Community-based Disaster Management: A Study on Flood Affected People in Bangladesh
[The collected data will be used only for research work and the anonymity of data will be ensured. The questions will be asked in Bangla]

No. of the interview schedule:

Name of the Village: Ajogara- 1 Chinaduli- 2

A. Information Related to Demographic and Socioeconomic Conditions of the Respondent

1. Personal and familial information of the respondent

a.1) Name: a.2) Sex: Male-1 Female-2 a.3) Age: .... years

b) Educational qualification:

1. Illiterate 2. Only can write the name 3. Class 1- Class 5
4. Class 6- Class 10 5. SSC 6. HSC
7. Bachelor (Pass) 8. Bachelor (Honors) 9. Others

c) Occupation

1. Agricultural work 2. Agricultural Labor 3. Construction labor
4.Handloom labor 5. NGO worker 6. Health Worker
7. Rickshaw/Van puller 8. Teacher 9. Others

d) Monthly income: ..... Tk.

e) Total member of your family:..... Persons

f) Total monthly income of your family: ..... Tk.

2. No. of dependent family members: 2.1 Children..... 2.2. Old..... 2.3. Disabled ... Total:

3. Amount of land:

Type	Homestead	Agri. land	Pond	Marshland	other	Total
Amount						

4. Amount of land of your wife: 4.1. No land 4.2. ..... Decimal/ acre

5. Does your wife have other resources? 5.1 Yes 5.2 No

6. (If yes) what are these resources?

Type	Cow	Milch-cow	Goat	Duck	Hen	Gold	Silver	other
Number/ Amount								

7. Who take decision about using the resource of your wife?

7.1. Wife alone 7.2. Husband alone 3. Husband & wife jointly

8. Could you save money after familial expenditure?

8.1 Yes 8.1 No

9. (If yes) what is the medium of savings?

medium of savings	Bank	Cooperative Association	NGO	Other	Total
Amount					

10. Are you member of any government/ non-government association?

10.1 Yes 10.2 No

11. (If yes) mention the name of the associations.

Govt. Agency	**Non-govt. Agency**
Social Service department	Grameen Bank
BRDB	BRAC
Youth development	ASA
Others.....	Proshika
	Others.....

B. Information Related to Nature of Flood and Pre-flood Preparedness

12. Is your family affected by flood every year?

12.1 Yes 12.2 No

13. Has your family ever been affected by flood more than once in the same year?

13.1 Yes 13.2 No

14. What are the causes of frequent flood in your area?

14.1. Heavy rain 14.2. Increase of river water due to tide

14.3. Broken of flood control dam 14.4. No existence of flood control dam

14.5. Not to repair flood control dam 14.6. Others: .....

15. Has any physical structure been constructed for flood control as preparedness?

15.1 Yes 15.2 No

16. (If yes) what types of physical structures have been constructed for flood control as preparedness?

16.1. Construction of flood control dam 16.2. Construction of sluice-gate
16.3. Construction of bridge/culvert 16.4. Construction of flood shelter
16.5. Others.....

17. Who have constructed these physical structures?

17.1. Local Govt. (Union *Parishad*) 17.2. NGO (name)
17.3. LGED 17.4. Others.....

18. Were these physical structures repaired before the last flood?

18.1 Yes 18.2 No

19. (If yes) who repaired these physical structures?

19.1. Local Govt. (Union *Parishad*) 19.2. NGO (name)
19.3. LGED 19.4. Cooperative association
19.5. People of the community 19.6. Others.....

20. (If the answer to the question No. 18 is no) why were these physical structures not repaired before flood?

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21. (If the answer to question No. 19 is people of the community) did you participate in these works?

21.1 Yes 21.2 No

22. (If yes) in which works did you participate?

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23. Did the government and non-government organizations run other activities except constructing physical structures before flood?

23.1 Yes 23.2 No

24. (If yes) what are the names of these organizations?

24.1. Local Govt. (Union *Parishad*) 24.2. NGO (name)
24.3. Cooperative association (BRDB) 24.4. Social service Office
24.5. Others.....

25. What types of activities were run by these organizations (put √ mark in relevant box)

Name of the	Activities

Organization	Training	Awareness building	Micro credit	Technology transfer	Others
Union *Parishad*					
Social Service Office					
BRDB					
NGO (name)					

26. What were the subject-matters of training given by the above-mentioned organizations?

26.1. Food preservation
26.2. Seed preservation
26.3. Sheltering
26.4. Water purification
26.5. Should be done in snake biting
26.6. Protecting livestock
26.7. Preserving cattle food
26.8. Primary health care
26.9. Cultivate flood-tolerant crops
26.10. Poultry rearing
26.11. Tailoring
26.12. Others.....

27. Did you participate in these training programs? 27.1 Yes 27.2 No

28. (If yes) in which trades have you received training?

28.1. Food preservation
28.2. Seed preservation
28.3. Sheltering
28.4. Water purification
28.5. Should be done in snake biting
28.6. Protecting livestock
28.7. Preserving cattle food
28.8. Primary health care
28.9. Poultry rearing
28.10. Tailoring
28.11. Others.....

29. (If the answer to question No. 27 is no) what were the causes of not receiving training)?

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30. What were the subject-matters of awareness-building Program of the above-mentioned organization?

30.1. Preserving dry food
30.2. Preserving seed
30.3. Drinking pure water
30.4. Importance of treatment
30.5. Importance of having nutritious food
30.6. Which food contains nutrition
30.7. Caring of children and elder people
30.8. Caring of livestock
30.9. Neat and cleanliness
30.10. Responsibility after flood
30.11. Others.....

31. What were means of awareness building activities?

31.1. Community meeting
31.2. Group discussion
31.3. Training program
31.4. To attach poster
31.5. Distributing leaflet
31.6. To stage street drama
31.7. To show short film
31.8. Announcing through microphone
31.9. Others.....

32. Did you participate in these programs? 32.1 Yes 32.2 No

33. Did your wife participate in these programs? 33.1 Yes 33.2 No

34. (If no) why did your wife not participate in these programs?
- 34.1. Religious restriction
- 34.2. Men are enough
- 34.3. Tress of work
- 34.4. Too much age
- 34.5. Others.....

35. (If the answer to question No. 32 is yes) in which programs did you participate?
- 35.1. Community meeting
- 35.2. Group discussion
- 35.3. To watch street drama
- 35.4. To watch short film
- 35.5. Others.....

36. How have you benefited by participating in these programs?
- 36.1. Learn how to cope with flood
- 36.2. Achieving knowledge about food preservation
- 36.3. To know about preserving fodder
- 36.4. Achieving knowledge about water purification
- 36.5. To know about neat and clean
- 36.6. To know about flood prediction
- 36.7. Others.....

37. (If the answer to question No. 32 is no) Why did you not participate in these programs?
- 37.1. Do not know about these programs
- 37.2. No benefit
- 37.3. Tress of work
- 37.4. Old/more age
- 37.5. Others.....

38. What steps did you take before flood for reducing loss of flood?
- 38.1. Raising plinth of homestead
- 38.2. Raising floor of house
- 38.3. Not make wall with mud
- 38.4. To move house in upper place
- 38.5. To put/set tube-well in high place
- 38.6. To repair flood control dam
- 38.7. To preserve seed in safe place
- 38.8. To preserve food
- 38.9. To preserve cattle food
- 38.10. To raise bank of pond
- 38.11. To enclose bank of pond by net
- 38.12. To cultivate flood-tolerant crops
- 38.13. Others.....

39. In which works did your wife (or other women of your family) participate?
- 39.1. Participate in raising homestead
- 39.2. Participate in raising floor of house
- 39.3. Preserving food
- 39.4. Preserving seed in safe place
- 39.5. Preserving cattle food
- 39.6. Preserving fuel
- 39.7. Raising bank of pond
- 39.8. Surround bank of pond by net
- 39.9. Others.....

40. Who took decisions regarding preparedness in combating flood?
- 40.1. Husband alone
- 40.2. Wife alone
- 40.3. Husband-wife jointly
- 40.4. Family members jointly
- 40.5. Others.....

41. (If husband alone) what were the reasons for not taking opinion of women?
- 41.1. Male can make right decision
- 41.2. Women are not able to make decision
- 41.3. Women depend on male‘s opinion
- 41.4. Women’s decision is not acceptable
- 41.5. Others.....

C. Information Related to Problems Faced by People during Food, Coping Strategies and Services Provided by Neighbors, Government and Non-government Organizations

42. Did anybody come to rescue you from dangerous situation during the last flood?
42.1 Yes 42.2 No

43. (If yes) who came to rescue you during flood?
43.1. Neighbors 43.2. Relatives
43.3. Union *Parishad* (member, chairmen) 43.4. NGO (name)
43.5. Others.....

44. Did neighbors help you apart from rescuing during flood?
44.1 Yes 44.2 No

45. (If yes) how did your neighbors help you during flood?
45.1. Provide shelter 45.2. Food supply
45.3. Drinking water supply 45.4. Medicine supply
45.5. Providing necessary information 45.6. Transportation help
45.7. Take away in safe place 45.8. Look after the children
45.9. Look after the elderly 45.10. Help in preserving valuable goods
45.11. Help in protecting crops 45.12. Help in protecting fish of pond
45.13. Others.....

46. (If the answer to question No. 44 is no) why did your neighbors not help you?
46.1. They also remained in danger 46.2. Due to poverty
46.2. Looseness of social bondage 46.4. Destroy of beneficent attitude
46.5. Others.....

47. Did you get any service from government agencies (GAs) during the last flood?
47.1 Yes 47.2 No

48. Did you get any service from non-government organizations (NGOs) during last flood?
48.1 Yes 48.2 No

49. What types of assistance were provided by the GAs and NGOs during the last flood?

ypes of Services	Organizations			
	nion *Parishad*	GOs	ocial service Offi	thers
ransportation				
roviding information				
ake away in safe place				
ive shelter				
ood Supply				
rinking water supply				
Iedicine supply				
thers				

50. What types of problems did your family face during the last flood?

50.1. Food shortage
50.2. Scarcity of pure drinking water
50.3. Scarcity of fuel
50.4. Illness
50.5. Problem of keeping livestock
50.6. Lack of safe shelter
50.7. Scarcity of cattle-food
50.8. Problem of movement
50.9. Problem of evacuation (to stool)
50.10. Lack of employment
50.11. Scarcity of baby food
50.12. Disturbance of snake
50.13. Disturbance of mosquito
5014. Environment pollution
50.15. Absence of children in school
50.16. Absence in work
50.17. Valuable assets were stolen
50.18. Fishes of pond were lost
50.19. Drowned in water
50.20. Others.....

51. What measures did your family adopt to combat these problems?

51.1. Borrow
51.2. Receive relief
51.3. Collect pure water from distance
51.4. Water purification by using tablet
51.5. Boiling water to drink
51.6. Eating low standard food
51.7. Reducing amount of food
51.8. Searching alternative work
51.9. Preserving fuel
51.10. Take shelter in safe place
51.11. Using boat
51.12. Use alternative baby food
51.13. Remain awake at night
51.14. Watch jointly
51.15. Attentive to children
51.16. Defecation in water
51.17. Others.....

52. What types of problems did your wife (and other women) face during the last flood?

52.1. Problems of collecting water
52. 2. Problems of collecting fuel
52.3. Problems of cooking
52.4. Problems of sanitation of children
52.5. Impossible to maintain *purdah*
52.6. Problems of sanitation
52.7. Problems of managing menstruation
52.8. Problems of safety
52.9. Problems of reproductive health
52.10. Too much tress of work
52.11. Others

53. What steps were taken by women to cope with the situation?

.....
.....

54. Did GAs provide special service for solving problems of women?

54.1 Yes 54.2 No

55. Did NGOs provide special service for solving problems of women?

55.1 Yes 55.2 No

56. (If the answer to the question No. 54 & 55 is yes) what were the services?

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57. (If the answer to the question No. 54 & 55 is no) why did the government and non-government organizations not provide special services for solving the problems of women?

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58. How did you solve the problems of food shortage during flood?
58.1 Reducing amount of food
58.2. Reducing number of meal
58.3. Having/eating low-price food
58.4. Eating vegetable
58.5. By borrowing
58.6. By receiving relief
58.7. Others.....

59. (If the answer is reducing amount of food or number of meal) who did eat less amount of food?
59.1. Only female 59.2. Only male 59.3. Both male and female

60. (If only female) why did only female eat less amount of food?

---

61. What steps were taken for protecting fish of pond?
61.1. Raising the bank of pond
61.2. Surround the bank of pond by net
61.3. Surround the bank by bamboo net
61.4. Watching
61.5. Others.....

62. What steps were taken for protecting crops?
62.1 Cut the crops before time
62.2. Cut the crops very fast by others' help
62.3. Cultivate short-time crops
62.4. Others.....

63. How were food grains and seeds preserved?
63.1. In polythene bag
63.2. Earthen vase
63.3. Aluminum pot
63.4. Plastic bag/pot
63.5. Others.....

64. What roles did you (male) play to combat the situation evolved during flood?
64.1. Repairing house
64.2. Raising floor of house
64.3. Making platform (*machan*)
64.4. Collecting food
64.5. Preserving valuable goods in safe place
64.6. Taking shelter in safe place
64.7. Protecting elder
64.8. Protecting children
64.9. Feeding the cattle
64.10. Collecting cattle food
64.11. Others.....

65. What roles did your wife (women of your family) play to combat the flood situation?

65.1. Preserving dry food 65.2. Collecting water
65.3. Collecting food 65.4. Collecting fuel
65.5. Preparing food 65.6. Preserving seeds in safe place
65.7. Looking after the children 65.8. Looking after the elder
65.9. Looking after the ill people 65.10. Taking care of cattle
65.11. Feeding the cattle 65.12. Collecting food for cattle
65.13. Others.....

66. Where did you take shelter during the last flood?
66.1. Relative's house 66.2. Neighbors' house
66.3. Academic institution 66.4. On flood control dam
66.5. On high road 66.6. At own house
66.7. Others.....

67. How did you stay at house (if the residence was inundated?)

---

68. What kinds of attitude did your neighbors show when you wanted to take shelter in their house?
61.1. Provided shelter with very joy 61.2. Provided shelter with joy
61.3. Provided shelter 61.4. Provided shelter with reluctance
61.5. Disagreed to provide shelter 61.6. Showed bad attitude
61.7. Others.....

69. (If the answer to question No. 68 is showing bad attitude) what were the reasons for this attitude?

---

70. Have you ever stayed at flood shelter?
70.1 Yes 70.2 No

71. (If yes) what types of services were available at flood shelter?
71.1. Food 71.2. Drinking water
71.3. Medicine 71.4. Primary health care
71.5. Sanitation facilities 71.6. Electricity
71.7. Others.....

72. What types of problems did you face at flood shelter?
72.1. More people 72.2. No separate room for women
72.3. No separate toilet for women 72.4. Lack of drinking water
72.5. Lack of fuel 72.6. No electricity
72.7. Dirtiness 72.8. Problem of cooking
72.9. Impossible to maintain *purdah* 72.10.Bad/displease behavior to women
72.11. Others.....

73. What steps should be taken to solve these problems?

73.1. Separate room for women
73.2. Separate toilet for women
73.3. Increase the number of tube-well
73.4. Availability of electricity
73.5. Supply of cooked food
73.6. Safety measures for women
73.7. Others.....

D. Information Related to Health and Treatment System

74. By which diseases were your family members attacked during flood?

74.1. Diarrhea
74.2. Dysentery
74.3. Fever
74.4. Skin diseases
74.5. Others.....

75. Which types of treatment were taken?

ypes of treatment for male	**ypes of treatment for female**
o treatment	o treatment
onsult with doctor and bye medicine	onsult with doctor and bye medicine
ye medicine without prescription of doctor	ye medicine without prescription of doctor
omeopathic treatment	omeopathic treatment
erbal treatment	erbal treatment
thers	thers

76. Did GAs and NGOs provide women with special health service?

ypes of the agencies	Types of answer	
	es	o
As		
GOs		

77. (If yes) describe the health service facilities.

---

78. Who took the decision related to coping with flood situation?

78.1. Husband alone
97.2. Wife alone
78.3. Husband and wife jointly
97.4. All family members
97.5. Others.....

79. (If husband alone took the decision) why was women's opinion not taken?

E. Information Related to Post Flood Adaptation and People's Participation

80. What types of problems did you face after flood?

80.1 food crisis
80.2 Illness
80.3 Problem of shelter
80.4 Financial crisis
80.5 Problem of sanitation
80.6 Lack of health care services
80.7 Problem of movement
80.8 Problem related to education
80.9 scarcity of drinking water
80.10 Lack of fuel

80.11 Problem of cooking
80.12 Lack of employment
80.13 Lack of agricultural inputs
80.14 Problem of reproductive health
80.15 Others.....

81. What role did you (male) play to come back in normal life after flood?
81.1. Repair damaged house
81.2. Make new house
81.3. Repair source of water
81.4. Cleaning surrounding of the house
81.5. Attentive to agricultural work
81.6. Others.....

82. What roles did your wife (or women of your family) play to come back in normal life after flood?
82.1. Repair damaged house
82.2. Cleaning surrounding of the house
82.3. Help in agricultural works
82.4. Vegetable gardening
82.5. Plantation beside house
82.6. Others.....

83. How did you repair damaged house?
83.1. Self
83.2. Help of each other
83.3 Self along with hiring labor
83.4 Hiring labor
83.5. Help of government
83.6. Help of NGO
83.7. Others.....

84. How did women (your wife) help in agricultural works?
84.1. Prepare seed
84.2. Prepare seed bed
84.2. Sow/plant seed
84.4. Preparing field
84.5. Water irrigation
84.6. Crops processing
84.7. Others.....

85. Did GAs and NGOs help you to come back in normal life after flood?

ypes of the agencies	Types of answer	
	es	o
As		
GOs		

86. (If GAs helped)) how did GAs help you to come back in normal life after flood?
86.1. Repair damaged house
86.2. Make new house
86.3. Distribute CI sheet
86.4. Supply seed to farmer
86.5. Supply fertilizer to farmer
86.6. Supply pesticides
86.7. Interest free credit
86.8. Credit of low interest rate
86.9. Distribute food grains
86.10. Repair roads
86.11. Distribute tube-well
86.12. Repair tube-well
86.13. Health Service
86.14. Medicine supply
86.15. Supply net to fishermen
86.16. Supply boat to fishermen
86.17. Others.....

87. (If NGOs helped) how did NGOs help you to come back in normal life?

87.1. Repair damaged house
87.2. Make new house
87.3. Distribute CI sheet
87.4. Supply seed to farmer
87.5. Supply fertilizer to farmer
87.6. Supply pesticides
87.7. Interest free credit
878. Credit of low interest rate
87.9. Distribute food grains
87.10. Repair roads
87.11. Distribute tube-well
87.12. Repair tube-well
87.13. Health service
87.14. Medicine supply
87.15. Supply net to fishermen
87.16. Supply boat to fishermen
87.17. Others.....

88. How much were these activities effective to come back in normal life after flood?

88.1. Too much effective
88.2. Very effective
88.3. Effective
88.4. Moderately effective
88.5. Not effective

89. What kinds of steps did you take in agricultural sector to adjust with flood?

89.1. Cultivate flood tolerant paddy
89.2. Cultivate short term crops
89.3. Cultivate jute in place of paddy
89.4. Cultivate mastered after flood
89.5. Cultivate pulse
89.6. Cultivate sweet potato
89.7. Cultivate spices (Garlic, onion...)
89.8. Cultivate vegetable
89.9. No step (no cultivatable land)
89.10. Others.....

90. Did you do other works except your main occupation in combating flood situation?

90.1 Yes 90.2 No

91. (If yes) what were the jobs/works?

91.1. Food for works
91.2. Agricultural labor
91.3. Construction worker
91.4. Earth cutting
91.5. Catching fish
91.6. Small business
91.7. Others.....

92. Apart from these works how did you combat flood?

92.1. Receive relief
92.2. Land sell
92.3. Selling valuable goods
92.4. Help of relatives
92.5. Help of neighbors
92.6. Help of friends
92.7. Loan from relative, friend & neighbors
92.8. Loan from NGO
92.9. Loan from moneylender
9210. Land lease out
92.11. Others.....

93. (If selling goods) whose goods/ resources were sold?

93.1. Wife's goods 93.2. Husband's goods 93. Joint goods

94. (If wife's goods) mention the names of goods/resources.

94.1. Cow
94.2. Milch cow
94.3. Goat
94.4. Poultry
94.5. Ornaments
94.6. Land
94.7. Others

95. (If wife's goods) did you have any resource to sell? 95.1 Yes 95.2 No

96. (If yes) then why the goods of your wife were sold?

---

97. Who took these decisions to combat flood?

97.1. Husband alone 97.2. Wife alone
97.3. Husband and wife jointly 97.4. All family members
97.5. Others.....

98. (If husband alone) why the opinion of your wife (or women of your family) was not taken?

98.1. Male is (I am) enough 98.2. It is not women's work
98.3. Women's duty is to implement dec. 98.4. Women are not able to make dec
98.5. Others.....

99. What kind of additional steps should be taken before, during and after flood to combat the disastrous situation created by flood?

teps before flood	teps during flood	teps after flood

Thanks for your valuable opinion

Date: Signature of the investigator:

Appendix B

Interview schedule for collecting data from Female Respondents of a research project on Gender Issues in Community-based Disaster Management: A Study on Flood Affected People in Bangladesh

[The collected data will be used only for research work and the anonymity of data will be ensured. The questions will be asked in Bangla]

No. of the interview schedule:

Name of the Village: Ajogara- 1 Chinaduli- 2

A. Information Related to Demographic and Socioeconomic Conditions of the Respondents

1. Personal and familial information of the respondent

a.1) Name: a.2) Sex/gender: Male-1 Female-2 a.3) Age: .... years

b) Educational qualification:

1. Illiterate 2. Only can write the name 3. Class 1-Class 5
4. Class 6- Class 10 5. SSC 6. HSC
7. Bachelor (Pass) 8. Bachelor (Honors) 9. Others

c) Occupation

1. House wife 2. Agricultural Labor 3. Construction labor
4. Handloom labor 5. NGO worker 6. Health Worker
7. Teacher 8. Others

d) Your monthly income: ..... Tk.

e) Total number of your family member: ..... Persons

f) Total monthly income of your family: ..... Tk.

2. No. of dependent family member: 2.1 Children ..... 2.2. Old..... 2.3. Disabled ... Total:

3. Amount of land of your family:

ype	omestead	gri. land	ond	arshland	her	otal
mount						

4. Amount of your own land: 4.1. No land 4.2. ..... Decimal/ acre

5. Do you have other resources? 5.1 Yes 5.2 No

6. (If yes) what are these resources?

ype	ow	ilch-cow	oat	uck	en	old	lver	her
umber/ mount								

7. Who take decision about using your own resources?
   7.1. Wife alone 7.2. Husband alone 3. Husband & wife jointly

8. Could you save some money after familial expenditure? 8.1 Yes 8.2 No

9. (If yes) what is the medium of savings?

edium of savings	ank	ɔoperative ssociation	GO	ther	ɔtal
mount					

10. Are you member of any government/ non-government association?
    10.1 Yes 10.2 No

11. (If yes) name of the associations.

overnment Agency	**on-government Organizations**
ɔcial Service department	rameen Bank
RDB	RAC
outh development	SA
thers.....	roshika
	thers.....

B. Information Regarding Nature of Flood and Pre-flood Preparedness

12. Is your family affected by flood every year? 12.1 Yes 12.2 No

13. Has your family been affected by flood more than once in the same year?
13.1 Yes 13.1 No

14. What are the reasons/causes of frequent flood in your area?
    14.1. Heavy rain 14.2. Increase of river water due to tide
    14.3. Broken of flood control dam 14.4. No existence of flood control dam
    14.5. Others .....

15. Has any physical structure been constructed for flood control as preparedness?
    15.1 Yes 15.2 No

16. What types of physical structures have been built for flood control as preparedness?
    16.1. Construction of flood control dam 16.2. Construction of sluice-gate
    16.3. Construction of bridge/culvert 16.4. Construction of flood shelter
    16.5. Others.....

17. Who have constructed these physical structures?
    17.1. Local Govt. (Union *Parishad*) 17.2. NGO (name)
    17.3. LGED 17.4. People of the community
    17.5 Others.....

18. Were these physical structures repaired before the last flood?
    18.1 Yes 18.2 No

19. (If yes) who repaired these physical structures?
19.1. Local Govt. (Union *Parishad*) 19.2. NGO (name)
19.3. LGED 19.4. Cooperative association
19.5. People of the community 19.6. Others.....

20. (If the answer to question 18 is no) why these physical structures were not repaired before flood?

21. (If the answer to question 19 is people of the community) did you participate in these works?
21.1 Yes 21.2 No

22. (If yes) in which works did you participate?

---

23. Did the government and non-government organizations run other activities except constructing physical structures before flood? 23.1 Yes 23.2 No

24. (If yes) what are the names of these organizations?
24.1. Local Govt. (Union *Parishad*) 24.2. NGO (name)
24.3. Cooperative association (BRDB) 24.4. Social service Office
24.5. Others.....

25. What types of activities were run by these organizations as preparedness (put √ mark in relevant box)

ame of the Organization	Activities				
	raining	wareness buildir	icro edit	echnology transfer	thers
nion *Parishad*					
ocial service Office					
RDB					
GO (name)					

26. What were the subject-matters of the training given by the above-mentioned organizations?
26.1. Food preservation 26.2. Seed preservation
26.3. Sheltering 26.4. Water purification
26.5. Should be done in snake biting 26.6. Protecting livestock
26.7. Preserving cattle food 26.8. Primary health care
26.9. Cultivate flood-tolerant crops 26.10. Poultry rearing
26.11. Tailoring 26.12. Others.....

27. Did you participate in these training programs?
27.1 Yes 27.2 No

28. (If yes) what were the subject-matters (trades) of receiving training?
28.1. Food preservation 28.2. Seed preservation
28.3. Sheltering 28.4. Water purification
28.5. Should be done in snake biting 28.6. Protecting livestock
28.7. Preserving cattle food 28.8. Primary health care
28.9. Poultry rearing 28.10. Tailoring
28.11. Others.....

29. (If the answer to question No. 27 is no) what were the causes of not receiving training)?

---

30. What were the subject-matters of awareness building program of the above-mentioned organizations?
- 30.1. Preserving dry food
- 30.2. Preserving seed
- 30.3. Drinking pure water
- 30.4. Importance of treatment
- 30.5. Importance of having nutritious food
- 30.6. Which food contains nutrition
- 30.7. Caring of children and elder people
- 30.8. Caring of livestock
- 30.9. Neat and cleanliness
- 30.10. Responsibility after flood
- 30.11. Others .....

31. What were the means of awareness building?
- 31.1. Community meeting
- 31.2. Group discussion
- 31.3. Training program
- 31.4. To attach poster
- 31.5. Distributing leaflet
- 31.6. To stage street drama
- 31.7. To show short film
- 31.8. Announcing through microphone
- 31.9. Others.....

32. Did you participate in these programs? 32.1 Yes 32.2 No

33. (If the answer to the question No. 32 is yes) in which programs did you participate?
- 33.1. Community meeting
- 33.2. Group discussion
- 33.3. To watch street drama
- 33.4. To watch short film
- 33.5. Others.....

34. How were you benefited by participating in these programs?
- 34.1. To learn about coping with flood
- 34. To learn about food preservation
- 34.3. To know about preserving cattle food
- 34.4. To learn about water purification
- 34.5. To know importance of neat and clean
- 34.6. To know about flood prediction
- 34.7. Others.....

35. (If the answer to question No. 32 is no) why did you not participate in these programs?
- 35.1. Religious restriction
- 35.2. Do not know about these programs
- 35.3. No benefit
- 35.4. Tress of work
- 35.5. Take care of children and elder
- 35.6. Too much age
- 35.7. Others.....

36. What steps did you take before flood for reducing loss of flood?
- 36.1. Raising plinth of homestead
- 36.2. Raising floor of house
- 36.3. Not make wall with mud
- 36.4. To move house in upper place
- 36.5. To put/set tube-well in high place
- 36.6. To repair flood control dam
- 36.7. To preserve seed in safe place
- 36.8. To preserve food
- 36.9. To preserve cattle food
- 36.10. To raise bank of pond
- 36.11. To enclose bank of pond by net
- 36.12. To cultivate flood-tolerant crops
- 36.13. Others.....

37. In which works did you participate?
- 37.1. Participate in raising homestead
- 37.2. Participate in raising floor of house
- 37.3. Preserving food
- 37.4. Preserving seed in safe place
- 37.5. Preserving cattle food
- 37.6. Preserving fuel
- 37.7. Raising bank of pond
- 37.8. Surround bank of pond by net

37.9. Others.....

38. Who took decisions regarding preparedness to combat flood?
38.1. Husband alone
38.2. Wife alone
38.3. Husband-wife jointly
38.4. Family members jointly
38.5. Others.....

39. (If husband alone) what were the reasons for not taking opinion of women?
39.1. No value of women in family
39.2. Control of male will be decreased
39.3. Man does not want to loose leadership
39.4. To suppress women leadership
39.5. Others .....

C. Information related to problems faced by people during flood, coping strategies and services provided by neighbors, government and non-government organizations

40. Did anybody come to rescue you from dangerous situation during last flood?
40.1 Yes
40.2 No

41. (If yes) who came to rescue you during flood?
41.1. Neighbors
41.2. Relatives
41.3. Union *Parishad* (member, chairmen)
41.4. NGO (name)
41.5. Others.....

42. Did neighbors help you apart from rescuing during flood?
42.1 Yes
42.2 No

43. (If answer to the question No. 42 is yes) how did neighbors help you?
43.1. Provide shelter
43.2. Food supply
43.3. Drinking water supply
43.4. Medicine supply
43.5. Providing necessary information
43.6. Transportation help
43.7. Take away in safe place
43.8. Look after the children
43.9. Look after the elderly
43.10. Help in preserving valuable goods
43.11. Help in protecting crops
43.12. Help in protecting fish of pond
43.13. Others.....

44. (If the answer to question No. 42 is no) why did neighbors not help you?
44.1. They also remained in danger
44.2. Due to poverty
44.2. Looseness of social bondage
44.4. Destroy of beneficent attitude
44.5. Others.....

45. Did you get any service from GAs during last flood?
45.1 Yes
45.2 No

46. Did you get any service from NGOs during last flood?
46.1 Yes
46.2 No

47. What types of assistance were provided by other organizations during last flood?

ypes of Service	Organization			
	nion *Parishad*	GO	ɔcial service Office	thers
ransportation				
oviding information				
ake away in safe place				
ive shelter				
ɔod Supply				
rinking water supply				
edicine supply				
thers				

48. What types of problems did your family face during last flood?

48.1. Food shortage
48.2. Scarcity of pure drinking water
48.3. Scarcity of fuel
48.4. Illness
48.5. Problem of keeping livestock
48.6. Lack of safe shelter
48.7. Scarcity of cattle-food
48.8. Problem of movement
48.9. Problem of defecation
48.10. Lack of employment
48.11. Scarcity of baby food
48.12. Disturbance of snake
48.13. Disturbance of mosquito
48.14. Environment pollution
48.15. Absence of children in school
48.16. Absence in work
48.17. Valuable assets were stolen
48.18. Fishes of pond were lost
48.19. Drowned in water
48.20. Others.....

49. What measures did your family take to combat these problems?

48.1. Borrow
48.2. Receive relief
48.3. Collect pure water from distance
48.4. Water purification by using tablet
48.5. Boiling water to drink
48.6. Eating low standard food
48.7. Reducing Number of Meal
48.8. Searching alternative work
48.9. Preserving fuel
48.10. Take shelter in safe place
48.11. Using boat
48.12. Use alternative baby food
48.13. Remain awake at night
48.14. Watch jointly
48.15. Attentive to children
48.16. Defecation in water
48.17. Others.....

49. What types of problems did you face personally during last flood?

49.1. Problems of collecting water
49.2. Problems of collecting fuel
49.3. Problems of cooking
49.4. Problems of sanitation of children
49.5. Problems of maintaining *purdah*
49.6. Problems of sanitation
49.7. Problems of managing menstruation
49.8. Problems of safety
49.9. Problems of reproductive health
49.10. Too much tress of work
49.11. Others

50. What types of measures did you take to combat these problems?

---

51. Did government organization provide special service for solving problems of women?
51.1 Yes 51.2 No

52. Did non-government organization provide special service for solving problems of women?
52.1 Yes 52.2 No

53. (If yes) what were the services?

---

54. (If answer to the question 52 is no) why did the government and non-government organization not provide special service for solving the problems of women?

---

55. How did you solve the problems of food shortage during flood?
55.1 Reducing amount of food 55.2. Reducing number of meal
55.3. Having/eating low-price food 55.4. Eating vegetable
55.5. By borrowing 55.6. By receiving relief
55.7. Others.....

56. (If the answer is reducing amount of food to question No. 55) who did eat less amount of food?
56.1. Only female 56.2. Only male 56.3. Both male and female

57. (If only female is the answer to question No. 56) why did only female eat less amount of food?

---

58. What steps were taken for protecting fish of pond?
58.1. Raising the bank of pond 58.2. Surround the bank of pond by net
58.3. Surround the bank of pond by bamboo net 58.4. Watching
58.5. Others.....

59. How were food grains and seeds preserved?
59.1. In polythene bag 59.2. Earthen vase
59.3. Aluminum pot 59.4. Plastic bag/pot
59.5. Others.....

60. What roles did male members of your family play to combat the situation evolved during flood?
60.1. Repairing house 60.2. Raising floor of house
60.3. Making platform (*machan*) 60.4. Collecting food
60.5. Preserving valuable goods in safe place 60.6. Taking shelter in safe place
60.7. Protecting elder 60.8. Protecting children
60.9. Feeding the cattle 60.10. Collecting cattle food
60.11. Others.....

61. What roles were played by you (women) to combat the situation evolved during flood?

61.1. Preserving dry food	61.2. Preserving seeds in safe place
61.3. Looking after the children	61.4. Looking after the elder
61.5. Collecting food	61.6. Preparing food
61.7. Looking after the ill people	61.8. Looking after the cattle
61.9. Collecting cattle food	61.10. Collecting drinking water
61.11. Collecting fuel	61.12. Feeding the cattle

61.13. Others.....

62. Where did you take shelter during last flood?

62.1. Relative's house	62.2. Neighbors' house
62.3. Academic institution	62.4. On flood control dam
62.5. On high road	62.6. On high platform at own house

62.7. Others.....

63. How did you stay at house (if the residence was inundated?)

---

64. What kinds of attitude was showed by neighbors when you wanted to take shelter in their house?

64.1. Provided shelter with very joy	64.2. Provided shelter with joy
64.3. Provided shelter	64.4. Provided shelter with reluctance
64.5. Disagreed to provide shelter	64.6. Showed bad attitude

64.7. Others.....

65. (If answer to the question 64 is showing bad attitude) what were the reasons for showing this attitude?

---

66. Have you ever stayed at flood shelter? 66.1 Yes 66.2 No

67. (If yes) what types of services were available at flood shelter?

67.1. Food	67.2. Drinking water
67.3. Medicine	67.4. Primary health care
67.5. Sanitation facilities	67.6. Electricity

67.7. Others.....

68. What types of problems did you face at flood shelter?

68.1. More people	68.2. No separate room for women
68.3. No separate toilet for women	68.4. Lack of drinking water
68.5. Lack of fuel	68.6. No electricity
68.7. Dirtiness	68.8. Problem of cooking
68.9. Impossible to maintain *purdah*	68.10. Bad/displeased behavior to women

68.11. Others.....

69. What steps should be taken to solve these problems?

69.1. Separate room for women	69.2. Separate toilet for women
69.3. Increase the number of tube-well	69.4. Availability of electricity
69.5. Supply of cooked food	69.6. Safety measures for women

69.7. Others.....

D. Information Related to Health and Treatment System

70. By which diseases were your family members attacked during flood?
    70.1. Diarrhea 70.2. Dysentery
    70.3. Fever 70.4. Skin diseases
    70.5. Others.....

71. Which types of treatment were taken?

ypes of treatment for male	**ypes of treatment for female**
o treatment	o treatment
onsult with doctor and bye medicine	onsult with doctor and bye medicine
ye medicine without prescription of doctor	ye medicine without prescription of doctor
omeopathic treatment	omeopathic treatment
erbal treatment	erbal treatment
thers	thers

72. Did GAs and NGOs provide special health service to women?

ypes of agencies	Type of answers	
	Yes	No
As		
GOs		

73. (If yes) describe the treatment facilities.

---

74. Who took the decision related to coping with flood situation?
    74.1. Husband alone 74.2. Wife alone
    74.3. Husband and wife jointly 74.4. All family members
    74.5. Others.....

75. (If husband alone took the decision) why was women's opinion not taken?

E. Information Related to Post Flood Activities and People's Participation

76. What types of problems did you face after flood?
    76.1 food crisis 76.2 Illness
    76.3 Problem of shelter 76.4 Financial crisis
    76.5 Problem of sanitation 76.6 Lack of health care services
    76.7 Problem of movement 75.8 Problem related to education
    76.9 scarcity of drinking water 76.10 Lack of fuel
    76.11 Problem of cooking 76.12 Lack of employment
    76.13 Lack of agricultural inputs 76.14 Problem of reproductive health
    76.15 Others.....

77. What role did male members of your family play to come back in normal life after flood?
    77.1. Repair damaged house 77.2. Make new house
    77.3. Repair source of water 77.4. Cleaning surrounding of the house
    77.5. Attentive to agricultural work 77.6. Others.....

78. What roles did you play to come back in normal life after flood?

78.1. Repair damaged house
78.2. Cleaning surrounding of the house
78.3. Help in agricultural works
78.4. Vegetable gardening
78.5. Plantation beside house
78.6. Others.....

79. How did you repair damaged house?

79.1. Self
79.2. Help of each other
79.3 Self along with hiring labor
79.4 Hiring labor
79.5. Help of government
79.6. Help of non-government organization
79.7. Others.....

80. How did you help in agricultural works?

80.1. Prepare seed
80.2. Prepare seed bed
80.2. Sow/plant seed
80.4. Preparing field
80.5. Water irrigation
80.6. Crops processing
80.7. Others.....

81. Did GAs and NGOs provide you any help after flood?

ypes of agencies	Type of answers	
	Yes	No
As		
GOs		

82. (If GAs helped) how did GAs help you to come back in normal life after flood?

82.1. Repair damaged house
82.2. Make new house
82.3. Distribute CI sheet
82.4. Supply seed to farmer
82.5. Supply fertilizer to farmer
82.6. Supply pesticides
82.7. Interest free credit
82.8. Credit of low interest rate
82.9. Distribute food grains
82.10. Repair roads
82.11. Distribute tube-well
82.12. Repair tube-well
82.13. Health Service
82.14. Medicine supply
82.15. Supply net to fishermen
82.16. Supply boat to fishermen
82.17. Others.....

83. (If NGOs helped) how did NGOs help you to come back in normal life?

83.1. Repair damaged house
83.2. Make new house
83.3. Distribute CI sheet
83.4. Supply seed to farmer
83.5. Supply fertilizer to farmer
83.6. Supply pesticides
83.7. Interest free credit
83.8. Credit of low interest rate
83.9. Distribute food grains
83.10. Repair roads
83.11. Distribute tube-well
83.12. Repair tube-well
83.13. Health service
83.14. Medicine supply
83.15. Supply net to fishermen
83.16. Supply boat to fishermen
8317. Others.....

84. What types of services were provided by government and non-government organizations for solving the problems of women?

ervices Provided by Government Agencies	**ervices Provided by Non-government Orgs.**

85. How much were these activities effective to come back in normal life after flood?
77.1. Too much effective 77.2. Very effective
77.3. Effective 77.4. Moderately effective
77.5. Not effective

86. Did you do other works except your main occupation to cope with flood?
86.1 Yes 86.2 No

87. (If yes) what were the jobs/works?
87.1. Food for works 87.2. Agricultural labor
87.3. Worked as maid servant 87.4. Earth cutting
87.5. Catching fish 87.6. Small business
87.7. Others.....

88. Apart from these works how did you combat flood?
88.1. Receive relief 88.2. Land sell
88.3. Selling valuable goods 88.4. Help of relatives
88.5. Help of neighbors 88.6. Help of friends
88.7. Loan from relative, friend & neighbors 88.8. Loan from NGO
88.9. Loan from moneylender 88.10. Land lease out
88.11. Others.....

89. (If answer to the question 88 is selling goods) who was the owner of the goods/resources?
89.1. Wife 89.2. Husband 89.3 Family members jointly

90. (If answer to the question 89 is wife) mention the names of goods/resources.
90.1. Cow 90.2. Milch cow
90.3. Goat 90.4. Poultry
90.5. Ornaments 90.6. Land
90.7. Others

91. (If wife's goods) had your husband any resource to sell?
91.1 Yes 91.2 No

92. (If yes) then why were your goods sold?

---

93. Who took these decisions to combat flood?
93.1. Husband alone 93.2. Wife alone
93.3. Husband and wife jointly 93.4. All family members
93.5. Others.....

94. (If husband alone) why was your opinion not taken?
94.1. Men are enough to make decision 94.2. Men's control will be reduced
94.3. Men do not want lose leadership 94.4. To suppress women leadership
94.5. Others .....

95. What kind of additional steps should be taken before, during and after flood to combat the disastrous situation created by flood?

eps before flood	eps during flood	eps after flood

Thanks for your valuable opinion

Date: Signature of the investigator:

Appendix C

Interview schedule for collecting data from Chairman, Member and Women Member of the Union *Parishad* of a research project on
Gender Issues in Community-based Disaster Management: A Study on Flood Affected People in Bangladesh
[The collected data will be used only for research work and the anonymity of the data will be ensured. The questions will be asked in Bangla]

No. of the interview schedule: Name of the Union *Parishad*:

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1. Name of the respondent:

2. Address:

3. Educational Qualification: Age:

4. Description of receiving training

---

5. Is flood occurred every year in your locality?
   5.1 Yes 5.2 No

6. Has flood been occurred more than once in the same year?
   6.1 Yes 6.2 No

7. What are the causes of frequent flood in your area?
   7.1. Heavy rain 7.2. Increase of river water due to tide
   7.3. Broken of flood control dam 7.4. No existence of flood control dam
   7.5. Not to repair flood control dam 7.6. Others: .....

8. In which years flood occurred in your locality?

9. Was river erosion happened with flood?
   9.1 Yes 9.2 No

10. Is there Union Disaster Management Committee in your Union Parishad?
    10.1 Yes 10.2 No

11. Are you member of this committee?
    11.1 Yes 11.2 No

12. How frequently is the meeting of this committee held during normal period?
13. How frequently is the meeting of this committee held during flood?

14. Did you participate in the meeting of this committee?
    14.1 Yes 14.2 No

15. (If yes) what types of opinion have you given to combat flood?

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16. Is there Union Disaster Management Plan in your Union?
16.1 Yes 16.2 No

17. (If yes) was the opinion of people taken during preparing Disaster Management Plan?
17.1 Yes 17.2 No

18. (If yes) how was the opinion of people taken?
18.1 Community meeting 18.2 Community survey
18.3 informal communication 18.4 Others:.....

19. Was the opinion of women taken during preparing Disaster Management Plan?
19.1 Yes 19.2 No

20. (If No), what were the reasons for not taking opinion of women?

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21. (If the answer to the question No. 17 is yes) which issues were emphasized by people for incorporating Disaster Management Plan?

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22. (If the answer to the question No. 19 is yes) which issues were emphasized by women for incorporating Disaster Management Plan?

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23. Were these opinions taken into consideration during preparing Disaster Management Plan?
23.1 Yes 23.2 No

24. (If yes) how was the opinion of people taken into consideration?

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25. What types of program have been taken to combat the flood?
25.1 Infrastructural development 25.2 Providing training
25.3 Awareness building 25.4 Group discussion
25.5 Distributing relief 25.6 Arrangement of drinking water
25.7 Others.....

26. What steps have been taken for infrastructure development?

26.1. Construction of flood control dam 26.2. Construction of sluice-gate
26.3. Construction of bridge/culvert 26.4. Construction of flood shelter
26.5. Others.....

27. Were these infrastructures repaired before flood?

27.1 Yes 27.2 No

28 (If no) what were the reasons for not repairing these infrastructures?

---

29. In which issues/subjects training was provided among the people?

29.1. Food preservation 29.2. Seed preservation
29.3. Sheltering 29.4. Water purification
29.5. Should be done in snake biting 29.6. Protecting livestock
29.7. Preserving cattle food 29.8. Primary health care
299. Cultivate flood-tolerant crops 29.10. Poultry rearing
29.11. Tailoring 29.12. Others.....

30. How awareness was created among the people to combat flood situation?

30.1. Community meeting 30.2. Group discussion
30.3. Training program 30.4. To attach poster
30.5. Distributing leaflet 30.6. To stage street drama
30.7. To show short film 30.8. Announcing through microphone
30.9. Others.....

31. Did women participate in these programs?

31.1 Yes 31.2 No

32. (If no) what were the reasons for non-participation of women in these programs?

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33. What types of measures are usually taken by the people for preparedness?

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34. What types of problems were created due to flood in your area?

34.1. Food shortage 34.2. Scarcity of pure drinking water
34.3. Scarcity of fuel 34.4. Illness
34.5. Problem of keeping livestock 34.6. Lack of safe shelter
34.7. Scarcity of cattle-food 34.8. Problem of movement
34.9. Problem of evacuation (to stool) 34.10. Lack of employment
34.11. Scarcity of baby food 34.12. Disturbance of snake
34.13. Disturbance of mosquito 3414. Environment pollution
34.15. Absence of children in school 34.16. Absence in work
34.17. Valuable assets were stolen 34.18. Fishes of pond were lost
34.19. Drowned in water 34.20. Others.....

35. What types of services did you provide to solve these problems?

35.1 Supply of food 35.2 Supply of drinking water
35.3 Supply of medicine 35.4 Providing health services
35.5 Especial health services for women 35.6 Others

36. What types of problems were faced by women due to flood?

36.1. Problems of collecting water 36. 2. Problems of collecting fuel
36.3. Problems of cooking 36.4.Problems of sanitation of children
36.5. Impossible to maintain *purdah* 36.6. Problems of sanitation
36.7. Problems of managing menstruation 36.8. Problems of safety
36.9. Problems of reproductive health 36.10. Too much tress of work
36.11. Others

37. What types of services did you provide to solve the problems of women?

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38. What types of measures were adopted by the people to cope with the situation during flood?

---

39. What roles did women play to cope with the situation during flood?

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40. What types of problems were evolved in this area after flood?

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41. What types of services did you provide to solve these problems?

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42. What types of problems were faced by women after flood?

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43. What types of services did you provide to solve the problems of women?

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44. What types of measures did the people take to return to normal life after flood?

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45. What types of roles did women perform to return to normal life after flood?

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46. How does men-women cooperation may be increased to combat flood situation?

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47. Observation of the Investigator:

Thanks for your valuable opinion

Date: Signature of the investigator:

Appendix D

Interview schedule for collecting data from Chairman, Member and Women Member of the Union *Parishad* of a research project on
Gender Issues in Community-based Disaster Management: A Study on Flood Affected People in Bangladesh
[The collected data will be used only for research work and the anonymity of the data will be ensured. The questions will be asked in Bangla]

No. of the interview schedule: Name of the Study Area:

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1. Name of the respondent:

2. Address:

3. Educational Qualification: Age:

4. Is flood occurred every year in your locality?
   4.1 Yes 4.2 No

5. Has flood been occurred more than once in the same year?
   5.1 Yes 5.2 No

6. What are the causes of frequent flood in your area?
   6.1. Heavy rain 6.2. Increase of river water due to tide
   6.3. Broken of flood control dam 6.4. No existence of flood control dam
   6.5. Not to repair flood control dam 6.6. Others: .....

7. In which years flood occurred in your locality?

8. Was river erosion happened with flood?
   8.1 Yes 8.2 No

9. Do your organization have disaster management plan?
   9.1 Yes 9.2 No

10. (If yes) was the opinion of people taken during preparing Disaster Management Plan?
    10.1 Yes 10.2 No

11. (If yes) how was the opinion of people taken?
    11.1 Community meeting 11.2 Community survey
    11.3 informal communication 11.4 Others:.....

12. Was the opinion of women taken during preparing Disaster Management Plan?
    12.1 Yes 12.2 No

13. (If no) what were the reasons for not taking opinion of women?

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14. (If the answer to the question No. 10 is yes) which issues were emphasized by people for incorporating Disaster Management Plan?

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15. (If the answer to the question No. 12 is yes) which issues were emphasized by women for incorporating Disaster Management Plan?

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16. Were these opinions taken into consideration in preparing Disaster Management Plan?
16.1 Yes 16.2 No

17. (If yes) how was the opinion of people taken into consideration?

---

18. What types of measures did you take before flood as preparedness strategy?

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19. What types of measures did the people take before flood as preparedness strategy?

---

20. What types of problems were created due to flood in your area?

20.1. Food shortage	20.2. Scarcity of pure drinking water
20.3. Scarcity of fuel	20.4. Illness
20.5. Problem of keeping livestock	20.6. Lack of safe shelter
20.7. Scarcity of cattle-food	20.8. Problem of movement
20.9. Problem of evacuation (to stool)	20.10. Lack of employment
20.11. Scarcity of baby food	20.12. Disturbance of snake
20.13. Disturbance of mosquito	2014. Environment pollution
20.15. Absence of children in school	20.16. Absence in work
20.17. Valuable assets were stolen	20.18. Fishes of pond were lost
20.19. Drowned in water	20.20. Others.....

21. What types of services did you provide to solve these problems?

21.1 Supply of food	21.2 Supply of drinking water
21.3 Supply of medicine	21.4 Providing health services
21.5 Especial health services for women	21.6 Others

22. What types of problems were faced by women due to flood?

22.1. Problems of collecting water	22. 2. Problems of collecting fuel
22.3. Problems of cooking	22.4.Problems of sanitation of children
22.5. Impossible to maintain *purdah*	22.6. Problems of sanitation
22.7. Problems of managing menstruation	22.8. Problems of safety
22.9. Problems of reproductive health	22.10. Too much tress of work
22.11. Others	

23. What types of services did you provide to solve the problems of women?

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24. What types of measures were adopted by the people to cope with flood situation?

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25. What roles did women play to cope with the situation during flood?

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26. What types of problems were evolved in this area after flood?

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27. What types of services did you provide to solve these problems?

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28. What types of problems were faced by women after flood?

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29. What types of services did you provide to solve the problems of women?

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30. What types of measures did the people take to return to normal life after flood?

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31. What types of roles did women perform to return to normal life after flood?

32.. How does men-women cooperation may be increased to combat flood situation?

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33. Observation of the Investigator:

Thanks for your valuable opinion

Date: Signature of the investigator:

Appendix E

FGD guidelines for collecting data of a research project on
Gender Issues in Community-based Disaster Management: A Study on Flood Affected People in Bangladesh

[The collected data will be used only for research work and the anonymity of the data will be ensured. The questions will be asked in Bangla]

Name of the StudyVillage: Name of the FGD Facilitator:

Information Regarding Nature of Flood and Pre-flood Preparedness

1. Is flood occurred every year in your locality?
2. Has flood been occurred more than once in the same year?
3. What are the causes of frequent flood in your area?
4. In which years flood occurred in your locality?
5. What types of physical structures have been constructed for flood control as preparedness before flood?
6. Who have constructed these physical structures?
7. Were these physical structures repaired before last flood?
8. Who repaired these physical structures?
9. Did you participate in these works?
10. Did the GAs/NGOs inform you about what should be done before flood as preparedness?
11. How were you informed about these matters?
12. Did you participate in these programs?
13. (Id did not participate) what were the reasons for non-participation?
14. How were you benefited by participating in these programs?
15. What steps did you take before flood for reducing loss of flood?
16. What roles were performed by male?
17. What roles were performed by female?
17. Who took decisions regarding preparedness to combat flood?
18. (If decisions were made by only men) what were the reasons for not taking opinion of women?
19. Was any meeting called by the Union *Parishad* to prepare disaster management plan?
20. (If yes) did you participate in that meeting?
21 (If yes) what types of opinion did you provide to prepare disaster management plan?
22. (If case of non participation of people) what were the reasons for not participating in that meeting?

23. Did women participate in that meeting?
24. (If no) what were the reasons for non-participation of women in that meeting?

Information Related to Coping Mechanisms

25. Where did you take shelter during last flood?
26. How did your neighbors help you during flood?
27. (If neighbors did not help) what were the reasons for not providing supports?
28. What types of problems did you face during previous floods?
29. What types of measures did you adopt to combat these problems?
30. What types of problems did women face during previous floods?
31. What steps were taken to solve the problems of women?
32. What types of services did the GAs and NGOs provide to solve problems of women?
33. (If services were not provided by GA-NGO) what were the reasons for not providing services to address the problems of women?
34. How did you combat the foods crisis during flood?
35. What roles did men perform during flood to combat the situation?
36. What roles did women perform during flood to combat the situation?

Post-flood Situation & Adaptation Strategies

37. What types of problems did you face after flood?
38. How did you combat theses problems?
39. What steps did you take to come back to normal life after flood?
40. What roles did men and women perform to come back to normal life after flood?
41. (If resources or land are sold to face post-flood situation) who was the owner of the resources/land?
42. (If woman was the owner) why were woman's resources/land sold?
43. Who took the decision to combat the post-flood situation?
44. (If men alone took the decision) why was women's opinion not taken?
45. How did the GAs help you to come back to normal life after flood?
46. How did NGOs help you to come back to normal life after flood?
47. Apart from the measures taken by the GAs and NGOs what should be taken to combat flood situation?

Thanks for your valuable opinion