People's Vulnerability, Risk and coping strategies in regard to natural Disaster: A study in Sathkhira District.

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Abbreviation

ADB	Asian Development Bank
BDPC	Bangladesh Disaster Preparedness Centre.
BWDB	Bangladesh water Development Board
BMD	Bangladesh Metrological Department.
BIDS	Bangladesh Institute of Development Studies
CDMP	Comprehensive Disaster Management Studies Problem
CBDM	Community Based Disaster Management
CEGIS	Centre for Environmental Geographic Information Services
DMB	Disaster management Bureau
FGD	Focus Group Discussion.
GOs	Government organization
LGRD	Local Government for Rural Development
MC	Micro Credit
MFIs	Micro Finance Institution
NGO	Non-Government Organization
VGF	Vulnerable Group Feeding
UN	United Nations.

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Declaration

This material embodied in this thesis is original and has not been submitted in part or full for any other diploma or degree of any university of home and abroad.

Mst. Rumana Yasmin

Abstract

Bangladesh is one of the most disaster prone countries in the world. Natural disaster is common phenomenon in Bangladesh, because of the climate and geographical location. Especially the coastal areas are most disaster prone areas and the people of coastal areas are most disaster affected people. The development efforts are frequently interrupted due to natural disaster. Every disaster caused a huge damage of assets and lives, it also severely affected the environment example cyclone 'Sidr''Aila' and 'Mahasen'.

The major disaster of Bangladesh is cyclone, Flood tidal surge, riverbank erosion, drought etc., History reveals that, with in last 100 years there were 60 cyclone, 54 flood (out of them 6 were deluge) 25 earthquake. Natural disaster is an inevitable and integral part of human history it cannot be eradicated and dispelled out but awareness and preparedness can reduce the damage.

In this situation, Government organization and NGOs played very vital role at that time disaster management, especially community based disaster management, peoples coping strategy and a number of NGOs have been running long term development programs aiming for reducing the vulnerability, creating awareness and enhancement of capacities of the poor to live with disaster during the disaster period. Women are the most vulnerable group women, children and disabled person are usually at greater risk than men it is the women who make it possible for the community to cope with disaster. The role of women is absolutely central to the management of disaster coping strategy.

The present studies intend to focus on how people are coping with disaster maintaining their livelihood and return to their normal life, it is also expected that the study will also find vulnerabilities and risks in relation to natural hazard and disasters.

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Chapter One

Introduction

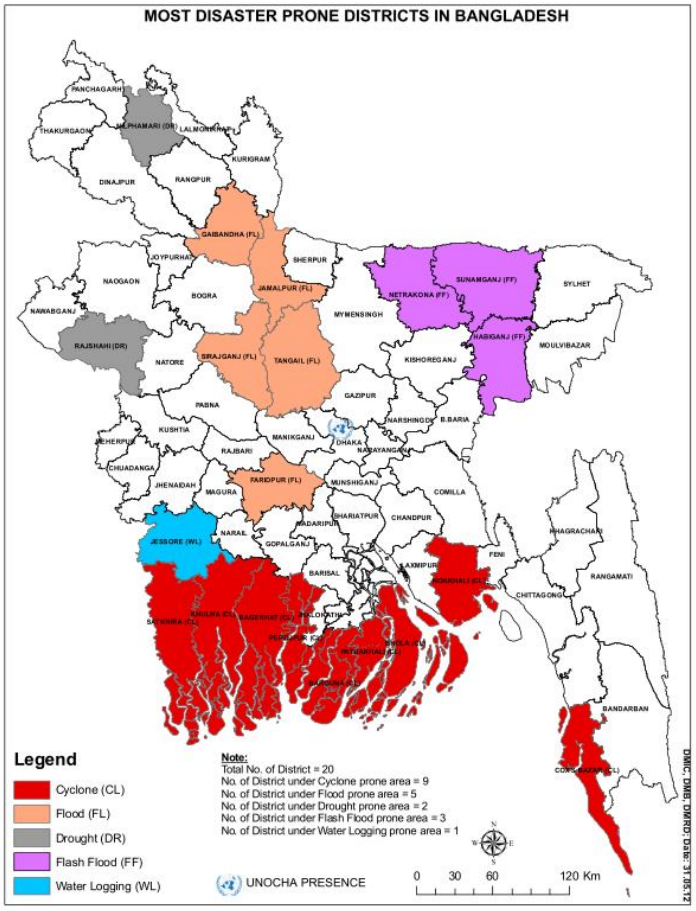
1. Introduction:

Disaster is a worldwide issue now. Various kinds of disaster occur in different countries of the world due to natural and social causes and almost all hazards turn in to disaster. The weather and climate is changing for many reason in the whole world. As a result many kinds of disaster are occurring or increasing. Each year more than 600 disaster occur globally. Disaster is an integral and inevitable part of human life and society. Bangladesh is one of the most disaster prone countries of the world. Natural disaster is common Phenomenon in Bangladesh, because of the climate and geographical location. The development efforts are frequently interrupted to the natural disaster. Every disaster causes a huge damage of assets and lives; it also severely affects the women, children and environment.

Bangladesh is a densely populated relatively poor country facing every year a number of natural and technical challenges. It is situated in the south Asian Sub continent. It is a country where disaster and the natural environment are linked. There are several factors that make Bangladesh particularly vulnerable to environmental degradation. The major ecological and environmental Problems in Bangladesh are natural disaster such as floods, cyclones, river bank erosion, drought, landslides, arsenic contamination in ground water, salinity and others etc. These natural disasters are often costly in terms of live lost and their impact on the economy. Floods and cyclones are regular visitors to the country.

Bangladesh is one of the ten most densely populated disaster prone countries of the world. Because of its unique geographical location and topography, floods, cyclone and other natural disasters occur everywhere. During the last 50 years, at last 7 series floods have occurred, affecting

about 35-75% of the land area. The economic loss due to the floods was huge e.g. 2.5 billion and US$3.00 billion respectively. Besides damages to crops and properties, severe floods also cause immense human suffering. All these mean a serious adverse impact on the national economy.



Bangladesh is a natural disaster prone country

Bangladesh experiences an almost unique environmental situation being located of the two of the world largest rivers and is one of the great flood and storm hazard zones of the earth. Cyclone and tidal surges resulting from monsoon tropical depression formally in the Bay of Bengal in the vicinity of Andaman Islands are common natural disaster have posed a constant threat to property and resource management issues of vulnerable are which lead to the determination of the general standard of living and

quality of their environment .The fatalistic people who are living in the unprotected areas term it as “an act of God” has not any complaint against the nature .But in the aftermath of disaster they undertook different types of strategies to cope with the diverted situation. For this reason it is very needed to understand people perception their coping strategies, further better planning and its implementation enable the affected people to adjust with more suitable in the post disaster period.

From historical time, Bangladesh has been subjected to different types of material disasters. Flood, Cyclone and tidal surge, tornado, earthquake and drought have often visited this country with devastating consequence. So much so that at different times this disaster took a heavy toll of human life and led to immense loss of property. These disasters adversely affect the country economy and impede its development program. The floods of 1987, 1998, 2000, 2004 and 2008 and the cyclone of 1970, 1991, 2007 and 2009 had brought destruction on a massive scale.

Any natural disaster in Bangladesh first affects the people living in the vulnerable areas. The livelihood security of the affected people becomes acute. They lose their houses, livestock, savings, food and employment opportunities.

Bangladesh is a low lying delta with very gentle slopes. It is located at the lowest end of the Gangas, Brahmaputra and Meghna Basin (Roy et al 2009). A large number of the total population of our country lives in the coastal areas. According to the population census 2001, the whole coastal area of the country has about 46 million people. The average size of the house hold is 7. The density of population is 743 per sq.km, womenfolk are 49% of the coastal population while 23% (8 million) are urban

dwellers. Size of the labor force (15-59) year's age group is 18.6 million which are about 53% of the coastal population (BBS2006).

Due to climate change most of the coastal areas of the world are at risk from natural disaster and metrological disturbances. The coastal areas of Bangladesh are not in different situation from it. Cyclone, tidal surge, flood, riverbank erosion are some of the worst type of disaster which is badly affecting the livelihood of our citizen especially in the coastal zone (Alam 2005).

1.1. Statement of the Problem:

Disaster has been an integral and inevitable pat of human history as it causes loss of human life, live stock and property. It is a recurrent phenomenon and increasing exponentially. Sizable positions of world populations in several countries are frequently subjected to various natural due to unique geo-climatic conditions. Such regions are susceptible to floods, droughts, cyclone, earthquake landslides etc.

Vulnerability risk and coping with disaster are critical issues to deal with both at micro and macro level. Every year a large number of people are cither die or missing become homeless and penniless. Also, there is a huge loss of agriculture field and products. Especially the poor people and women are highly vulnerable to the natural disaster prone areas due to poverty. Even many affluent people become poor and migrate to the cities or nearby safer places. Nonetheless some people still have to live in those hazard prone areas.

Statistics shows the picture in vicious. Since 1901 to 2010, 261 disasters have occurred in Bangladesh in which 1069960 people were killed 957867 were injured, 36556987 were become homeless and total member of

34656067 affected during the same period. In recent time in 2007, 15 Nov. 4234 people were killed and 6 million people were displaced or made homeless by cyclone SIDR. Again 1110 people were killed in flood in the same year. The figure of death and damages annunciated with different disaster in this small country is shocking. This was undoubtedly a depressing scenario for entire development of Bangladesh. People's failures to cope with hazards turns in to disaster and harmful and destructive intervention or relief response in needed. If peoples coping capacities are enhanced, disaster impacts can be minimized. Impacts of disaster can also be minimized and prevented through disaster risk reduction which will reduce people's vulnerabilities. However, enhancing people's capacity to cope with disaster is challenge. The study also aims to explore the communities which are deployed at different phases of disaster risk reduction. People's failure to cope with hazards turns in to disaster and at that eminent turns in to disaster and at that meanest turns in to disaster and at that moment intervention of relief response is needed.

1.2. Objective of the study:

General objective: The main objective of this study is focus on peoples coping strategies regarding disaster and return to their normal life.

Specific Objective:

1. To identity people vulnerabilities in disaster and factors related to disaster risk.

2. To assess the impacts of disaster on the different groups of strata of peoples particularly poor and women.

3. To highlight the coping strategies people employ in different phases of disaster.

1.3. Research Question:

01. What are the vulnerabilities?

02. What are the impacts of disaster on the victim's socio-economic condition?

03. What are the coping strategies people employ indifferent phases of disaster?

04. What factors affect their coping strategies?

05. Do the coping strategies very according to gender?

1.4. Rational of the study:

Disaster causes huge loss to the valuable human lives and economy of the country. It hampers poverty alleviation progress and washes out all development efforts. It is also threat for a achieving the target of SDGS. The development efforts will not be sustained until and unless the disaster impacts are minimized. Moreover poverty and disaster are intrinsically linked and here one cannot be tackled without addressing the other.

Coping with disaster is also key solution to many problems such as migration and Poverty etc. In recent time, the issue of climate change and global warming has added the extra concern for all. As a result, disaster risks reduction has become a challenge for GOS and NGOs. It has got the first priority along with poverty reduction. The proposed study can help policy makers. Planners and decision makers to think more effectively of community based disaster risk reduction to undertake programs for strengthening. People's capacity to copy with disaster to make self-resilient community.

1.5. Definition of the key terms:

In this study coastal areas means the places situated beside the bay of Bengal and many rivers of Bangladesh .The coastal areas of Bangladesh are facing the Bay of Bengal with an area of 4720/sqkm covers 19 districts: Bangherhat, Barguna, Barisal, Bhola, Chandpur, Chittagong, Cox's Bazar, Feni, Gopalgonj, Jessore, Thalokhati, Khulna, Laxmipur, Narail, Noakhali, Patuakhali, Pirojpur, Satkhira and Shariatpur.

Hazard:

Hazard is defined as recurring natural phenomenon such as flood, cyclone, and drought, landslides that pose a threat to lives, structures, or economic assets and which may cause a disaster.

Disaster

Disaster is a sudden, disastrous event that brings great damage, loss and devastation to life and property. It may also be termed 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 using its own resources. The present study will use the following criteria must be fulfilled for calling a natural hazard to a disaster.

Coping strategies:

The word "coping strategies" means the ways or means the people adopt by their knowledge and experiences in different phases of a disaster situation. In disaster management, coping means the trends and techniques where people gain their expected results by using their property. It is very much related with capacity. Strategies can be defined as a set of activities or mechanism by which people try to survive in disasters, recover their situation and develop their conditions after disasters.

Vulnerability:

Vulnerability means weakness, defectiveness, and less or no ability of people, community, society and its system. It is such a situation that makes or puts people at risk. Vulnerability is the condition determined by physical, social, economic and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards (UN 2009). Vulnerability is insecurity the reverse of security it reflects "the characteristics of a person or group in terms of their capacity to anticipate cope with, resist, and recover from the impact of natural hazard." It involves a combination of factors that determine the degree to which someone's life and livelihood is put at risk by a discrete and identifiable event in nature or in society. Vulnerability refers to exposure to contingencies and stress and difficulty in coping with them. It has two components: 1) an "external side of risks, shocks and stress to which a structure, individual, households, community or nation is subject, and 2) an “internal" side of lack of resources to cope without damaging loss." hossain 1994)

Risk:

Risk is the consequence of the interactions between hazard and vulnerability. Risk is called the probability of harmful consequences or expected losses that may occur in near future due to the lack of capacity to cope with natural hazards and reducing vulnerabilities.

Disaster Management:

Disaster Management is a special type of emergency management. It is an applied science, which seeks by the systematic observation and analysis of disaster to improve measures relating to prevention, mitigation, preparedness, emergency response and recovery. Management means

using men and resources to achieve the goals of an organization, a programmed, a project or a venture. In the process, a manager is to make the effective use of a number of management strategies involving men, materials, money, machines, methods, moments, movements and above all motivation. The term disaster management includes all aspects of planning for and responding to disasters.

Household:

The term household refers to all individuals who live in a dwelling having kitchen and bathroom facilities.

1.6. Scope and limitation of the study:

This research is expected to encourage future researches in this regard there is no research that is beyond limitation. The present research has also some of its limitations. Among the limitations and constrains the mentionable here are the study will be confined to the four villages of one district. - The study may not cover all disasters.

Chapter Two

Methodology of the Study

Mythodology of the Study

There are verities of research methods utilize in social sciences and suitable for a particular research. There are varieties of research methods available to the social scientist. Each of those methods has its own special strengths and weakness and certain are more appropriately status by same methods then by others. (Babbie 1986: 108)

2. Methodology:

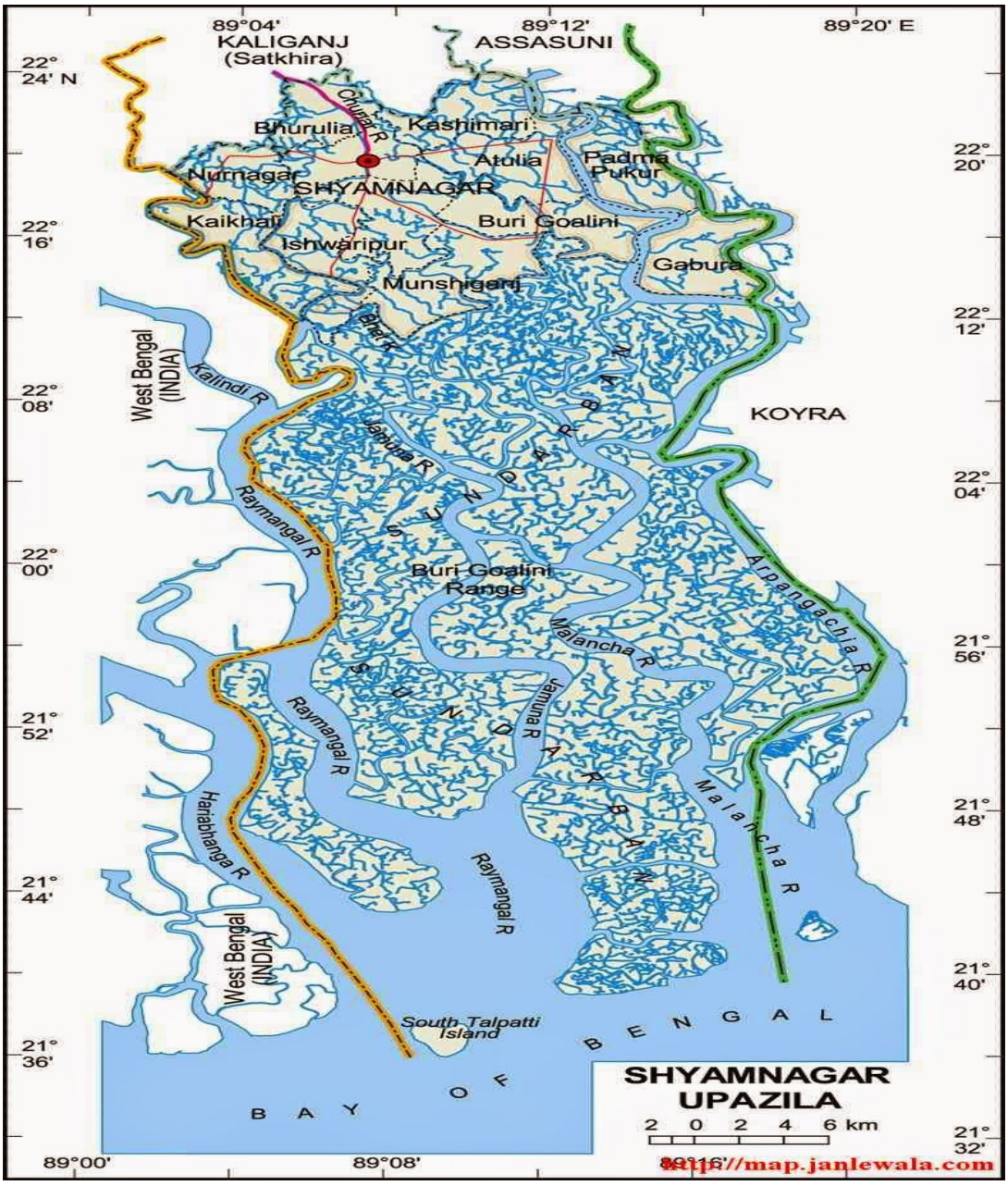
Methodology is one of the most important parts of any research. It means the way or manner by which the study is accomplished, which refers to the full outcome of the process at a glance. It includes some chronological steps that are necessary to complete the study successfully. Mode of operation differs with the nature of the study.

Methodology is always a compromise between options and choices and is frequently determined by the availability of relevant resources and time. It is very important in the sense that it gives one an idea how the study has been conducted. A proper methodology is always necessary for any report, which helps to organize experiences, observations examinations, analysis of data and information and their logical expression in a systematic process to achieve the ultimate goals and objective of the report. The present study will conducted through combination of qualitative and quantitative methods. The study was conducted in four most affected villages in satkhira district. The proposed research is a descriptive type of study .The study is empirical by nature. Random and purposive sampling techniques will be used for determining the sample size. However, questionnaire, FGD, case study was also be used as techniques of data collection. Approximately a number of 120 respondents was the study samples.

2.1. Selection of study area and sample size:

The study was carried out in Satkhira districts of Bangladesh. Shamnagar upazila under satkhira districts was the study area. In this disaster prone districts flood, cyclone, salinity and tidal surge caused devastating damages over the last few decades and mapped as severe flooding and vulnerable areas that are subject to riverbank erosion villages of unions of this upazila under this districts were selected as the study are.

Shymnagar upazila is bordered by kaligonj and assasuni upazila to the north, the Sundarbans and Bay of Bengal to the south. The main rivers here are Raymangal, Kalidi, Kobadak, Malancha etc. Symnagar town consists of 5 mouzas and 13 villages. It consists of 12 union parishad and 216 villages. The main occupation of the people is agriculture. Every year natural disaster visited this district. Gabura, which was the most severely affected union of satkhira district by cyclone sidr and aila.



2.2. Sample size and sampling:

Data was collected from the four villages of the disaster prone upazila. Purposive sampling method will be used for the proposed research. A total of 120 respondents were the study samples.

2.3. Data Type and source:

The proposed study was based on primary data mainly. However, secondary data was used for explaining and attaining research objectives. Data collected from the primary and secondary sources was both qualitative and quantitative by nature.

The source of Primary data was the respondents of the field survey. Primary data on coping strategies, vulnerabilities, risks, factors affecting coping strategies etc. was collected from them. The source of secondary data was document analyses. Secondary data was collected from journal books, research reports, websites and other available and relevant documents.

2.4. Technique of Data collection:

Required qualitative and quantitative data on demography, occupation, income, literacy, coping strategies and other household information from primary sources was collected through close- ended scheduled questionnaire survey, was collected through else ended scheduled questionnaire survey, FGD, observation, case study, in-depth interview. Data from secondary sources was collected through document analyses.

2.5. Scheduled Questionnaire Survey

Scheduled questionnaire survey is the prime source of primary data. Both close-ended and open-ended questions were used. The number of the respondents for scheduled questionnaire was 120. The sample respondents were selected randomly. A pre-test of the scheduled questionnaire was carried out before finalizing the main scheduled questionnaire.

2.6. Focus Group Discussion

The focus group discussion method was used to depict the different aspects of people's coping strategies and verify the information provided by other respondents. A list of topics was used for discussion in the session so that more information can be picked up. The FGD session was guided by the researcher. A total of 2 FGD sessions was held separately at Shymnagar Upazila 'of the concerned district. The session spots were selected as per convenience of the FGD members. The duration of each of these sessions will be one to two hours. 10 members for the FGD were selected purposively. They included 4 members; for each village 2 persons was selected from the respondents who have taken part in the scheduled questionnaire interview and the other 6 members from the local leaders and related GO and NGO officials in those Upazilas.

2.7. Case Study

Case study was also be used for gaining a deep insight and scrutinizing the facts behind the coping strategies such as their types and differences, related factors, changes in those strategies. The respondents were categorized by women headed households; victimized households who fail .to cope with the situation and by households who have been successful in minimizing disaster impacts. 6 case studies were carried out considering the above categories. Among them 2 case studies were from female-headed households, 2 from the households who fail to cope and 2 from the households who have been successful in reducing disaster impacts.

2.8. In depth Interview:

In depth Interview was carried out using open ended questionnaire. Attempts were made to know the answers of how and why. For example, why do they fail to cope with disasters? The number of respondents was 5 who were selected purposively.

2.9. Observation:

Observation method using field note technique was used to analyze non-verbal behavior of the respondents such as homestead scenario structural and nonstructural measures adopted by them to cope with disasters daily activities and efforts to seduce disaster impacts. This helped to compare the validity and reliability of data obtained from other source and techniques.

2.10. Technique of analyses:

Qualitative data collected through questionnaire survey, FGD Observation in depth quantitative data from primary and secondary sources were proceed and revised to minimize the error before final analyze. Deferent Household information such as age, occupation, literacy, household members, land ownership, assets was gathered. However data collected through observation. FGO and case study will be analyzed through logical reasoning of the respondents view.

2.11. Sampling Procedure:

Sampling is the process of selecting a subset of observation from among many possible observations for the purpose of drawing conditions about that larges set of possible observation.Babbie; 1986; 160). Since sampling is an essential part of all scientific procedure, the key principle in samples

in representativeness. The purpose of scientific sampling is to select a few who can be taken to represent the many [Babbie 1986, 160]

In this study, 120 respondents were selected to collect information about the research. They have been selected following cluster and simple random sampling procedure. First the affected region was grouped in districts. From these districts Satkhira and was selected and then union and at last 4 villages where selected. A household of that area was considered as observations unit of study. The peoples of each household were the respondents of this study.

Cluster and simple random sampling procedure is probability sampling procedure which inference to the populations is guided by a known probability of accuracy. The researcher can specify the probability that any particular clement of the population will be included in the sample.

2.12. Instrument of data Collection

Every research method has its own instrument of data collocations. In this study the method of interview based survey was adopted. This is because interview based survey can be used for descriptive, explanatory purposes. A well-structured interview is always better than an oral questionnaire Interview survey are usually conducted in face to face situation in which the interviews visit the respondents off question. Solicit response and record responses.

Interviews with structured questionnaire may be of different types. Such as open ended question and close ended question and then answers are predetermined. The same procedure was followed in this study to construct a well prepared interview schedule/ questionnaire that is based on the objectives and rational of the study.

In terms of case study it focuses on few units. They do not allow valid generalizations and particularly vulnerable to subjective bias. But this is very significant to high light here that to overcome the short coming of both interview and case study method the researches fail to conglomerate the techniques of data collection interims of undertaking both interviews and case study methods this conglomeration method helped researcher a lot to achieve real significance about what he wanted to focus really in the research effort.

Chapter Three

Theoretical Framework and Review of Literature

3. Theoretical Framework and Review of Literature:

Three theories such as Risk society theory, eco-feminism theory and socio economic back ground perspective of empowerment theory have been used in this study to analyze the research issue.

Modern social theory, particularly recent developments in Europe have illuminated theoretical themes in environmental sociology. Although historically presenting a definite a theoretical character, environmental sociology has recently began to contest the time-honored epistemological assumption of the natural environment as an independent, objective reality. In short, with the emergence of environmental degradation “as a barometer for the distribution of technological risk” comes a shift to a more direct theoretical concern with the social consequences of environmental degradation and resource management by environmental sociology (Picou and gill 1999; 144)

A social constructivist position characterizes much of this work, which argues that science itself provides "manufactured explanations of the world that should have no privileged claim on authenticity" (Cohen 1999:14). In its most extreme forms, the constructivist theoretical paradigm has been harshly criticized; however, this recent theoretical exploration of environment-society relationships has provided a number of themes relevant to institutional and organizational resource management. In fact, the constructivist paradigm identifies both macro and micro theoretical narratives that are relevant for understanding why the National Research Council recently identified the need for "risk characterization" rather than "risk assessment", recommending a broader, socially-based conception of risk for future assessments (Sterns and Feinberg 1996).

In the remainder of this paper, I will describe two macro-level theoretical themes which have framed global environmental political discourse over the last decade. Next, I will briefly address two micro-level theoretical themes that illuminate the local biophysical environment as a socio cultural variable, discursively linked to multiple groups for the management of resource-based risks. I conclude with a preliminary identification of areas of concern that need to be addressed by modern resource management in order to facilitate social and economic policy directives for the next millennium.

3.1. Risk Society

Two global theoretical models of post-industrial development have recently emerged out of Germany that have direct relevance for environmental sociology. From the writings of Ulrich Beck, which also parallel the contentions of Anthony Giddens, "risk society theory" identifies a shift in concern from the logic of wealth distribution to a concern with the logic of the distribution of risk. This is the orienting characteristic of the modern world (Beck 1992). As such, new technological risks and hazards pose a challenge that can only be overcome through •sub-political reorganization of environmental politics and the democratization of technical -knowledge (Beck 1992). A second global model embraces "sustainable developments the key issue for establishing harmonious relationships between economic development and' environmental stewardship.

3.2. Risk Society Theory

Ulrich Beck's view of the modern world is one of transformation, that is, "the modernization of modernity" or the demise of industrial society through two narratives-the risk narrative and the individualization

narrative. The risk narrative suggests that social conflict and inequality will emerge from the distribution of technological risks which were created by the very successes of industrial society. These modern social threats differ from previous risks because; (1) they are indictable by human sensory perception; (2) they transcend generations; and (3) they preclude causal attribution and compensation for victims (Beck 1992; 1996). Modern "manufactured" technological risks are "intangible" and cannot be smelled, heard, tasted or touched (Vyner 1988). Subsequently, modern risk judgments are made on the basis of "expert knowledge". Knowledge of risk in the modern world is viewed by Beck as, at best "second-hand, non-experience" (Beck 1992). Modern risks set the stage for societal self-annihilation and Beck's writings portend the dire consequences of contemporary technological hazards for the future and clearly illuminate the destructive side of progress,

Societal response to this shift in concern to omnibus technological catastrophe involves the process of "reflexive modernization" expressed through Beck's individualization narrative (Beck 1992). As Beck has written, reflexive modernization means:

The disintegration of the certainties of industrial society as well as the compulsion to find and invent new certainties for oneself and others without them. But it also means new interdependences, even global ones. Individualization and globalization are in fact two sides of the same process of reflexive modernization" (Beck 1996:14).

Beck sees structural change in the modern world as the process by which individuals are "set free from the certainties and modes of living of the industrial epoch -just as they were freed' from the arms of the church into society in the age of the reformation" (Beck 1992: 14).

As such "the authoritarian decision and action state gives ‘way to the negotiation state, which arranges stages and conversations and directs the show" (Beck 1996:39). This social transformation to risk society involves the "unbinding of science" through a broader sub-political critique by "citizen science." (Irwin 1995). Nongovernment organizations (NGOS) proliferate, responding to the inability of industrial society's institutions to insure and compensate victims of modern risks. Increasingly, modern institutions appear organized by the narrative of "irresponsibility" and must engage in a discourse over society's capacity to deal with the "side effects" of modern technology, especially toxic pollution and ionizing radiation (Beck 1992). This discourse also signals a change in the nature of "trust" in the modern world. Trust in traditional industrial society reflected an "unexamined and habitual confidence" in science and technology. As we move to risk society, trust now becomes "bestowed trust" which "has to be won," or earned, by modern governments, organizations, and groups from "autonomous, reflexive individuals" (Giddens 1990; 1991; Szerszynski 1999). This view portends an adversarial society, mobilized through risk anxiety and dominated by sub-political discourse on science, technology and environmental risks. Risk society portends a corrosive discourse, subject to conflict and anxiety.

3.3. Eco- feminism theory:

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 Ecofeminism to analyze these issues. It (Ecofeminism) has engendered a

great deal of scholarly debate since its inception in the mid-1970s, when the term ecofeminism 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). Eco feminists 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, 1992:2411). 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 resource 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 Eco feminists 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 polices, plans and programs in order to bring about gender equality within the given institutional framework (Matlin, 1999:5) This study also investigates whether there is any social transformation in terms of addressing gender issues in disaster management.

3.4. Socio economic background perspective theory:

One of the objective of the study is to examine the capability of people especially women to participate in the discussion- making process at household and community levels. As started earlier, patriarchal norms and values restrict women's mobility, male 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. To address the issue, the present study has used socio-economic background as theoretical concept for analyzing the capability of women to participate in copies strategic and disaster management activities.

Discussion of socio economic 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 powerless or absence of power. Emphasizing power relations kabeer (2005:13) states that "empowerment refers to the process by which those who have been denied the ability to make choices acquire such ability." It encompasses strategic life choices and participation in

discussion- making, policy formulation and implementation at organizational level. Socio economic backgrounds, referred by Kaaber as resource are the conditions under which choices are made. Resources not only mean the conventional economic resource but also the various human and social resources that enhance the ability to exercise choice. Human resource encompasses 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 in life and which enable people to improve their situation….. (Kabeer 2001: 20).Socio economic 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; frank1 2004; world bank 2008). The study, therefore, examines whether the socio economic background of women enhances 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 GOB 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 stakeholder in policy adaptation to implementation of CBDM program, the study investigate to what extent

the community people, especially women has active participation in 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 ecofeminism 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 resource on human behavior literature shows that resources whether maternal or non-maternal create confidence in the actors and affect their behavior, from individual to community level. Thus, the research looks in to what happens in the study area. Is there any influence of socio economic background of women on enhancement of their participation in disaster management activities? The study examines the role of socioeconomic background such as age, education, house hold, income, landownership, and organizational involvement in enhancing their participation.

3.5. Review of literature

Review of literature is a source of knowledge and provides a deep understanding about the topic or the issue closely related to the research to be undertaken. It also finds knowledge gap and justify the proposed research. In view of doing so, the researcher has gone through various relevant books, Journals, websites and research reports for finding a research gap and making new contribution in the exiting knowledge as well as relevant understanding about the research. In this chapter, it is found that the studies conducted recent years in Bangladesh on various aspects of disaster management, such as effect of natural disaster, coping strategies, and role of community people or participation of community and gender issue in disaster management. Despite its importance on disaster research and minimizing disaster impact, the issue of coping strategies has received almost no or a little attention from the disaster researcher. In this context the present study intends to make a profound insight in multiple disasters. It is expected that the present study will be able to bridge the research gap. Addressing the vulnerability, risk and gender issue, the proposed research will be different interns of showing coping strategies in multiple disasters, changes in coping strategies and factor affecting them. In the present research context, the available studies on disaster management that have been reviewed are divided in to three groups on the basis of their main focus1.Studies related to impact of disaster and coping capacity 2.studies related to coping mechanism of disaster affected people and3.Studies related to gender issues in disaster management.

Studies Related to Effect/Impact of Disaster and coping Capacity:

1. Adnanshapan, Floods people and the environment Institutional. Aspects of Flood protection in Bangladesh Research and advisory services. Dhanmondi Dhaka, 127.

The book is concerned regarding how the people' in Bangladesh and the environment within which they live have been affected by various flood control programmers. The observed patterns and processes placed in the framework of the institution of structures. Which death with floods as well as protection programs. From the available evidence author. Suggested that the people are net the man or beneficiaries of faulty flood protection structures rather a coterie of business interest and officials functionaries into in designing planning executing are maintaining such structures got the benefits from these constructions.

2.Ahmed Chowdhury 2002. Natural disaster in Bangladesh. Community development library. Dhaka.

The book country twenty five articles written by persons having different back grounds. It gives a more or less a general overview of flood in Bangladesh the articles of the book which are technical and general in nature are divided into five parts: (1) Overview (2) hydrology and morphology (3) Natural disaster and monograph (4) Structural measures and (5) human interference, Some articles in the collection appear useful and interesting.

These articles contain a detail description of flood and other disasters the author also highlights the types of flood and also the different flood control measures that were undertaken in the past. It is general overview of floods in Bangladesh.

3. AMohit Dr. Mohammad Integrated Approach to cyclone disaster management and community this articles start with vulnerability due to natural disaster may differ from country to country place to place and person to person. Basically vulnerability to natural disaster like cyclone and storm surge depends upon the physical and socio economic condition of a' particular area. The impacts of cyclones and storm surges of equal magnitude would be different in Bangladesh than USA or any other developed country. From the recent natural disasters in Bangladesh it is found that the existing disaster management system of this country is uni-directional (flows from natural phenomena to human activities) and grossly inadequate in terms of such aspects as men and materials legal instrument spatial coverage public participation and linkage with development planning under these circus trances for improving the disaster management capability of the nation it is centennial to integrate. Disaster management cyclone disaster planning and involvement of general public at all levels and stages of disaster management process.

4. AriyabanduMadhaviMalalgoda- Bringing together disaster and

Development concepts and practice- This articles starts with the global scenario in relation to disasters is dismal statistics indicate that the impact of natural and manmade hazards on life and livelihoods is increasing globalization is aggravating poverty and vulnerability. This chapter argues that disaster risk is a part of the dynamic forces at play in the process of development Disasters need to be seen in the context of where they take place and within what comply and dynamic physical socio-economic institutional and political complete unless it addresses contributory factors to disaster risk ultimately the objective of development and disaster management need to be the same that is reducing socio economic vulnerability.

5. 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 river bank corrosion and coping capacity of the victims. They employed both qualitative and quotation approach to analyze the primary and secondary data. They observed that there was no existence of early warning system 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 helped overall capacity building of the local people. Although, people remain alert the erosion, sometimes they do not went to move from their residence due to erosion attachment as well as lock of financial support. The study did not find any instance that the displaced people were prepared for facing the disaster. However, they face insecurity during and in the after math of disaster. As a result, hall and nutritional states of the victims decline abruptly. They also do not get proper sanitation facilities new places. As a result, unhygienic sanitation practices affect the health station of the displaced people. It is also 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 disaster, However, the study pointed out that in spite of providing financial supports by the government and non-government organization (NGO), the displaced people become compelled to depend on borrowing from relatives, friends and Mahajan's. Since the organizational assistance in 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.

6. Haider, Rahman and Huq (1991) in an investigation titled Environmental and perceptional perspective of cyclone 91 assed 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 valuable to cyclone shelters and other secure places. The reason behind poor response was disbelief in warnings, because since the 1970 cyclone, many warning had been issued, even the great Danger signal Number 10, but nothings serious had happened. However, the cyclone 1991 caused large members of casualties (138000 people.) large areas were submersed 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 house hold use was contaminated with salinity and livestock, house thing farms were washed away and many people lost thing jobs and livelihoods.

7. Juthi (2003) in her study on flood 2000 identified the causes of flood and proposed solution based on the opinion of the affected people. She observed that heavy rainfall of 17-19 Sep. 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 organization 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 main training an acceptable situation. They also took initiative to drains 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 manmade as well as through informal

community system. River management should also be develop and rives 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 problem and their role in combating serious natural events like flood.

8. Nino, smith and Roy (2004) in their study titled impact of the 1998 flood on house hold 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 food, nature of coping with food security and response of GOs and NGOs in preventives major food crises during and after flood. Data showed that income of flood exposed people declines due to flood that directly impact 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 suffering from food insecurity and individual 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 author concluded that to reduce negative impact of natural disaster, 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.

9.A Study titled cyclone Aila (25 May 2009) : Initial Assignment report with focus on Khulna Ray et al. (2009) assessed the damage, livelihood and the after math of Aila based on primary data collected through interviews, focus group discussions and observation secondary data were

also collected through consult ting govt. Document and Published reports in national and local dailies, The research 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 livelihood. Food security was badly broken down due to the cyclone. Supply of pure drinking water, dry food and provide with proper medication were higher priority sectors in assistance. The authors also confirmed that there was a direct need for proper sanitation facilities that badly affect the people life in the coastal area.

The hard hitting Aila destroy homestead road communication and embankment. The Authors assessed the impact of Aila on mass people unfortunately the study did not address the gender issue such as the needs of women, their coping technical concerns natural catastrophe events and the nature of their participation at household and community levels,, adopting policy, plans and program to combat natural disaster.

Studies Related to coping Mechanism of Disaster Affected People:

1. HaqueNazmul

Disasters and vulnerability the role of NGOS. Grassrootsvo/1. July-September. An attempt is made to describe flood and vulnerability of people in disaster prone situations and the role of NGOS. Three types of vulnerability are distinguished physical/Material; Social /organizational and motivational /attitudinal. It is pointed out that government programmes in reducing vulnerability were not effective which created scope for NGOS interventions NGOS in recent years proves their effectiveness in relief and rehabilitation activities. Author suggested some ways through which NGOS can play an effective role. Poverty alleviation programmed is also lively to reduce the vulnerability of people. An integration of NGOS regular development program in the pre disaster and post disaster context is urgently needed.

2. One study (Royet al 2004) analyzing the existing system of linkage between GOS and NGOS with special references to some credit Programs in Bangladesh observes that in early 1980 the Asia and pacific regional Agricultural credit association (APRACA) took the initiative to popularize this avocation tried to adopt this system under the leadership of the control Bank in early 90s. The study also observes that the outreach and repayment performances of the linkage scenes are encouraging and praise worthy, even though the general environment of rural banking is be settled with low disbursement and high default the study reveals that the group lending strategy has got some advantages which are firstly it laps to rack a number of customers in a single transaction secondly, group lending reduces default lending risks of the lenders as the group is jointly liable for the

entire loan. This study also observes that linkage between NGOS and financial institution has been proved to be an effective method of emergency needs both in rural and urban areas. So banks as formal MFIS can meet 'the credit needs of the poor by adopting well-conceived delivery system using NGOS as financial intermediaries.

3.Another Study BRDB Institutional support project (BIS) 1999 concerning the condition and interest rates of micro credit programs cores 15 rural poor program Belonging to BRDB NGOS Department of women affairs Department of the study compares a total of 22 characteristic of the programs including objectives institutional arrangements target group number of beneficiaries credit disbursement sources of loan fund terms and conditions loan fund terms and condition loan process, loan limit, repayment, recovery rates, interest service charge etc. The study reveals that the credit recovery rates of the programmers vary from 94% to 99-100% and calculates that the relate of interest are high (25%- to 30%) among the NGOS and relatively low (12% to 13%) among the GO program.

4.Yunus Muhammad Expending Micro credit outreach to reach the millennium development goals some issues for attention the micro credit summit of 1997 set the goal to reach too million of the world’s poorest families with micro credit preferably through the women in those families by 2000. It is possible that by the end of 2002 and most lively we will cross the half way mark or 50 million reedit in disaster situation and post conflict areas has also been well documented enabling families in those areas to rebuild economic activities and livelihoods when these services are flexible convenient studies have also shown that micro-credit programmed improve the coping mechanisms of the poor. This is

demonstrated very clearly during times of disaster such as during the floods and cyclone in Bangladesh.

5.Saleh UdddinAhmed: Micro-credit and poverty new realities and strategic issue Micro- credit and or micro finance in its wider dimension has become a much favored intervention for poverty alleviation can play an important or le in natural disaster this credit can be done by creation opportunities for wage employment by raising agricultural productivity among small and marginal farmers and by increasing opportunities for self-employment Micro finance is particularly relevant for increasing the productivity of self-employment in the informal sector of the economy. In an environment where economic growth is occurring micro finance also has the capacity to transmit the benefits of growth more rapidly and more equitably through the informal sector.

6. Loan programs the role of NGOL BDPC- with the decrease in Production in natural disaster there was shrinkage in their income. This made them unable to pay back their loans in time the NGOS did not recollect the loans granted to people for three months besides they granted loans at no interest with easy term and conditions from many organization that used to collect 90 percent of the loans the number reduced to 30 to 40 percent. Different NGOS are now thinking of adopting preventive measures for this kind of situation in future.

7.Disaster Management and risk reduction in Bangladesh- the articles starts with reducing risks by improving the economic status of the poor who are vulnerable to natural disaster. Reducing poverty by enhancing the long term development capacity of the poor people vulnerable to natural disasters. This articles the author shows that sustainable development by enabling access to development resources and services for improving long

term resilience of the targeted household in this situation micro-credits has a plays great role in natural disaster or micro credit as a tool of natural disaster management.

8. Disaster management and public awareness in Bangladesh M.Saifur Rahman This paper discuses in a general term the concept of disaster management and the organization edifice in the context of mitigating of disaster in risk in Bangladesh.

Management means using men and resources to achieve the goals of an organization a program a project or a venture. In the process a manager is to make the effective use of a number of management strategies involving men materials money machines methods, Disaster management is a special type of emergency management. It is an applied science which seeks by the systematic observation and analysis of disaster to improve measures relating to prevention, mitigation, preparedness, emergency response, and recovery.

9. HarichandanHrusikesh community participation in Disaster

Mitigation and risk reduction (with special reference to cyclone) Disasters are natural processes as old as human existence. Disasters are of national and international concern only when human beings are affected and social life disturbed. The author argues that the occurrence of disasters like cyclones, floods, earthquakes, volcanic eruptions, tornados etc and not be prevented. Disaster is often believed to be fated. In the after math of a disaster there are attempts from corner (Governments, NGOs, International communities) for long term mitigation plans. Disaster management has become an event rather than process of development. Linkage in mainstream programs can reduce cost on relief heads by improving local capacity and prepared measures. For cyclone prone areas can be used as

rest sheds during cyclone. But in many schools, as besots roofs which are of no use during cyclone and other disasters are used. So there is a need to understand the responsibilities of various stockholders in reducing the impacts of disasters and to make communities aware of counter disaster management plans.

10.Zohir, Sajjad. in his study "Micro credit: An Alternative Perspective on its Dynamics in Bangladesh" says, Rural females want to accumulate savings in their own names, and MCIs enable them to realize this objective. Rural males want credit and, up to a certain level, they are willing to tolerate the absence of their women folk from household chores. Finally, MCIS are able to ensure minimum savings from the same set of members who are borrowing, which enables the MCIS to safeguard against risk. The follow-up implications are: First, if extra effort is given to involve the women in economic activities, the cost of transactions would increase and this would have to be borne by the MCIs. Second, if economic condition of the borrowing households improves substantially, the males are likely to associate higher cost to female participation in financial transactions, which in turn, will increase the cost. In the absence of support to realize the desired objectives, one may find the MCIs increasingly shifting their focus away from the poor.

11.Sagar, Sohel Mahmud. in his study "Poverty and Micro finance Programs: ASA'S Experience",(2003) evaluated ASA's activities through micro credit distribution by saying, ASA's experience suggests that "sustainable outreach should be the central objective of micro finance institutions (MFIs) and MFIs must commit themselves to achieve a significant sustainable outreach within a short time spell". This means that MFIs must be conscious about achieving cost-efficiency. MFIs have a social obligation to be cost efficient because the poor cannot afford to pay

for the inefficiencies of service providers. ASA does. Everything to make its operations cost-effective and sustainable; all of its efforts are for sustainable delivery of service to the poor. As a result of these efforts ASA has been able to achieve the following: An extension of its coverage to approximately 2.11 million poor families throughout Bangladesh Mobilized savings from members amounting to Taka 9,460 million (US $163 million).

Savings balance of Taka 2,298 million (US $40 million). Number of branches reached 1,171. Borrowers from 1.93 million families have outstanding loans totaling of Taka 7,871 million (US $136 million).

The methodology and financial services of ASA are standardized and innovative. ASA has introduced a highly decentralized system of management. A well-written manual on operations, accounts, audio, etc has also been introduced. Standardized branch structure, operational budget, furniture and equipment, office rent, etc have made ASA'S operation cost effective. Accounting, record-keeping and MIS have been made simple and easy. Quick service, reduction of paperwork and other formalities are ensured.

12.Ahmed, Sabbir. In his study "BRAC's Microfinance Canvas: Financial. Services and Strategic Linkages", (2003) discussed that Eighty percent of BRAC loans were used for productive investment, asset purchase and housing; only 3 percent were used for household consumption. Since joining BRAC, nearly 4 percent of member households graduated from landlessness and shifted to different landholding groups. Above 45 percent of BRAC members are now themselves directly involved in some income generating activities; before joining BRAC the figure was only 28 percent. BRAC member households

owned 50 percent higher net worth than non-BRAC members. BRAC member households had two times more savings than the 'control' households. Average per capita calorie consumption and total food and nonfood expenditures were significantly higher for BRAC member households. Ratio of non-food to total expenditure was also higher for BRAC, which mainly increased with an increase in the household income. BRAC members were found to be significantly better off than the 'control' households in term value of their dwelling places and per capita floor space utilization. Level of education, adult literacy and primary school enrolment of the group members significantly improved after joining BRAC. Not only micro-finance volume, but also the institutional framework of micro finance is to be constantly strengthened for delivering micro finance.

13. Greeley, Martin. In his study "Sustainability and Poverty Outreach: Trade-off Issues" (2003) viewed that, Among the 1.2 billion people identified as the very poor- those falling below $1 a day- there will .be households for whom micro finance is not an appropriate instrument. There may be households without capacity for enterprise for a variety of reasons. .There may be households that require other forms of assistance to develop their capacity prior to undertaking credit-based enterprises. The fact that such households exist clearly should not be taken as a reason for excluding all the very poor. Rather, it is recognition that other types of interventions will also be necessary for some. It is important to give due importance to institutional considerations, especially leadership with integrity, in determining programmed sustainability. Many MFOs enjoy a 'cozy' relationship with donors and are not serious on sustainability concerns.

14. In a study entitled Adaptation to climate changes for sustainable Disaster risk Reduction: A perspective from Bangladesh Amin (2009) shows that how climate change throws challenges to existing disaster Risk Reduction (DRR). Practice and making people more vulnerable to frequent natural hazards. It includes how adaptation to climate change would be principle component of DRR approved as well as would be able to address the future impact on livelihood. It this study the climate change trend in Bangladesh has been addressed in order to incorporate climate change issues to DRR approach. In this paper, current DRR practices has been compared with the adaptation stateside to better cope with natural hazard (i bid). The study shows the adaptation stratifies to climate changes but could not generate any findings on community participation disaster management program. Therefore the present study has been conducted to explore it.

15.Yodmani S. (2001 in his study entitled Disaster risk management and vulnerably reduction: Protection the poor shows that proactive disaster Management, focusing on reduce of disaster risks have a signification contribution to the goods of protecting vulnerable communities, their lives, assists and livelihood. The study finding reveals that disaster mitigation using government and intuition alone is insufficient because they pay little attention to address the community dynamics, perception or priorities. At the same time local communities are after either unaware of their formal disaster management intervention or they find the intervening in appropriate due to lack of recognition of community's vulnerable and capacity. In they lack the external resources or technical support to supplement their own initiative and capacity. Infect every individual family, organization; business end public service within a community is affected by disaster. Therefore, everyone has got the responsibility to participation in disaster mitigation program. The study shows that the

multitude of actions that must be taken to implement on effective disaster management program requires the participation of entire community. The study (2001) calving that with proper training and information the communities are able to safeguard and minimize the disaster risks. The above study emphasize on community peoples, participation in program implement, but the people's needs, disaster risks and their copings mechanism were not identified in the study.

16.Mahmud, Huda and Ansari (2009) in a study evaluate the post sidr livelihood reconstruction actives and the scope of adopting communication risk mitigation measure taken south Khali Union in Sarankhela Upazila under Bagherhat district is a case. The study area is one of the highly affected area by the divested side and wintered of higher death tool followed by Patharghata of Barguna district. The study (2009) finds that a lot of government and non-Government activities are currently operating to counter this and to rebuild the live livelihoods system of the study area, but the Problems persists and the people are struggling live to cope with yet another burden. The study also revel's that issues of disaster management are not focused here up till now by the working NGOs of the study area or event by the Govt. However, it is also sound that several multiple food security activities like agro forestry and community level disaster risk mitigation approaches have been adopted by several communication and individual.

16. Bangladesh center for advance study (BCAS) and Bangladesh Environmental lawyers Association (BELA) in a study titled Adaptation Practices of Drought and flood affected people is Bangladesh documented. The existing coping Strategies in relation to natural disaster, particularly flood and drought. Basically it is an assessment of the project which are

beings implementation by Govt. NGOs for adapting to drought and flood. The study has identified same practices that are applied to cope with drought such as deep-water irrigation homestead gardening, tree plant supply of drinking water canal re-excavation, awareness raisins and training. On the other hand flood exposed people, GOs and NGs apply same techniques for adapting to flood vulnerably such as constraint of embankment, Kasbah (catkin) plantation in char lands and irrigation tree plantation in others areas for flood protection community based seed conservation for post flood cultivation, relief disaster for flood victim, provides healthcare services construction of community based flood shelters and adopting fish farming. Unfortunately same important issue such as gender need participation of women as well as communality attitude toward women participation in disaster management process are not focused in the study. In fact the study is solely confined to examining the effective of govt. NGO run program project for adapting to drought and flood.

17. Another study titled Flood 98: Relief, Rehabilitation and management conducted by Khuda and Nizamuddin (2000): Assessed the emergency of relief program undertaken during and after flood, based on primary data collected thrush a Questionnaire survey and secondary data. Finding showed that about 49% respondents received relief from GAS and NGO of to cope with the situation. Some of them received relief from more than one agency but some did not received relief event for once which effected rehabilitation process. The study pointed out that although different agencies feared epidemics and famine would follow timely intervention and manage relief program helped in avoiding such catastrophe. The poor people were prided with food grain under vulnerable from feeding (VGF)

Project for ensuring food security the Govt. also distributed test relief expanded food formwork program, sold rice in low price, under open market sale (OMS) program end provided collateral-free loan to the poor or marginal farmers. Although the study has dealt with various aspects of coping mechanic, the fact is that the issue of women's rehabilitation a vulnerable group and their role in managing disaster are absent in the study.

Studies related to gender issues in Disaster Management:

1. AhmedNilufar, Women and Environment the Bangladesh case women for women a Research and study group collected articles.

The article starts with the premise that there is a linkage between women and nature. It is suggested that since women have to look after the family and the household their dependence on nature become critical to sustain and nourish their family, Major ecological and environmental Problems were highlighted. It is furthers argued that the principal victims of environmental degradation are the most under privileged people author also focused on the poorly planned Fcd/1 and other development projects. Brief mention a made or the important natural disasters of Bangladesh such as cyclone and food,. The paper includes with some recommendations on environmental problems with particular focus or women and environment.

2. Mahmud, Simeen. in her study "Micro credit and Women's Empowerment in Bangladesh", (2003) viewed her ideas by saying, empowering changes may not be seen at all the different dimensions, and even when they are, these effects may not be of similar magnitude. This suggests that the process of empowerment is more readily pronounced at some dimensions than at others. Most important is increasing women's ability to exercise authority, increasing access to male dominated resources

that expand choice (formal schooling, wage employment and male-dominated public space; e.g., the market). These may cause erosion of male dominance of long-standing social and economic institutions. For the sake of social acceptance and sustainability, micro credit has to accompany social mobilization to be rightly planned and executed. The Redeeming feature of micro credit programme participation is that, even without a significant increase in women's access to resources whose allocation is structurally determined, it is possible to increase access to other choice-expanding but less restricted resources and to enhance the exercise of women's agency, both of which can eventually be effective in transforming the very structures that restrict women's access to resources. In this respect a long term and sustainable programme strategy would be to promote the expansion of women's access to household resources, particularly income generated from loan investment. This is possible by providing micro credit services that equip women to be active in decisions about loan use and in the control over incomes from loan investment. In addition to loans, related non-formal functional education is an indispensable corollary for women's empowerment. That also will cause a break-away from stagnation.

3. Nasreen (2001) in her study titled coping mechanism of rural women in Bangladesh during floods; A gender perspective highlighted survival methods of rural women in Bangladesh from general perspective. The author explanation is band on primary data of a longitude 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 responsive of protecting their houses, children and other members of the family, livestock and other belonging. Traditional gender specific work becomes difficult for them, but man do not assists them because out age old ideal of gendered division of labor. Women bear

more physical burden of coping than men. The research identified some problem which women face in flood shelter such as those of cooking, shortage of fuel, felling of being insecure, and failure to maintain pardas insufficient toile facilities fare snack from forestation. The study also did not highlight women participation in decision making process of disaster management at household and community level.

4.Nizamuddin et al.(2001) in their scholarly article titled women headed house hold displaced by river bank erosion: Problem and strategies of survival explorer the problem created by river bank erosion and survival of the women headed house hold. They found that the respondents found that the respondents faces different types of problem such as, unemployment, low-wages, lack of medical facility, malnutrition, insecurity of life and property, lack of privacy, education of children access to institutional credit etc. In terms of coping with financial crises, the respondents take loan from relatives or friends. Even they take loan money lenders with high interest rate. Sometimes they cut down their food intake. They also can not avail proper treatment due to lack of financial support. However, the researchers observed that the respondents try to cope with insecurity by themselves. Although the problem of women headed household have been highlighted with utmost important. Women's role in disaster management plans and program dos not get any important in this study.

5.Siddika (2008) conducted a study title women's livelihood resilience and adaptation option for climate change, in which she analysis the livelihoods option fro women in flood exposed areas made a link between threat of climate change and women livelihood and identified the mitigation and adaption options. The participation rural appraisal method has been used in this study area, principle method data collection. Data

also collected by FGD and case study. The Authors observed that women of the study area perceive that different type of flood, flooding higher frequency flood and sudden floods in 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 Agriculture sector. The common crops with flood by change food habits diversion of income option and dependent on credit loan from NGOs or local money lenders. But women's role and long term adaption activities with climate change has not been explored in this study.

Chapter-Four
Natural Disaster in Bangladesh

4. NATURAL DISASTER IN BANGLADESH

The term "environment" is usually defined as the system of biological and physical resources and their process of interaction that affect life and livelihood. These bio physical systems are in fact, in constant interaction with human beings and their social system. The physical development activities for human beings and their social system. The physical development activities for human benefit use and interact with these biological and physical resources these components of the environment in a complex manager.

Most of the world's natural disasters occur in Asia and the pacific. South Asia is a very disaster prone region. Bangladesh is one of them. Bangladesh is most vulnerable to several natural disasters and every year natural calamities upset people lives in some part of the country. The major disasters concerned here are the occurrences of flood, cyclone and storm surge, flash flood, drought, tornado, river bank erosion and landslide. These extreme natural events are termed disaster whey they adversely affect the whole environment including human beings their shelters or the resources essential for their livelihoods.

The geographical setting of Bangladesh makes the country vulnerable to natural disasters. The mountains and hills bordering almost three- fourths of the country along with the funnel shaped Bay of Bengal in the south have made the country a meeting place of life giving monsoon rains, but also make it subjected to the catastrophic ravages of natural disasters. Its physiographic and river morphology also contribute to recurring disasters. Abnormal rainfall and earthquakes in the adjacent Himalayan range add to the disaster situation. The apprehended climatic changes have a great impact on the overall future disaster scenarios. Since Bangladesh is a

disaster prone country, it is subject to colossal damages to life and property almost every year.

4.1. Different types of natural disaster

Disasters are usually classed into two; those which are used by the forces of nature and those which are due to the interaction of human actions and natural processes and resources. Social scientists have added a third category that of social disasters. The different types of disasters and their impact on the affected areas. From historical time Bangladesh has been subjected to different types of natural disasters.

Types of Natural disaster

1) Flood
2) Tropical cyclone (typhoon hurricane)
3) River Bank erosion
4) Land slide
5) Volcanic eruption
6) Tsunami
7) Bushfire (or wild fire)
8) Drought
9) Epidemic
10) Strom surge
11) Major accident
12) Civil unrest
13) Salinity

Flood in Bangladesh

Types of Disaster	Areas Affected	Impact
Flood	Floodplains of the Brahmaputra - Jamuna, The Ganges -Padma and the Meghna river system	Loss of agricultural production, disruption of communication and livelihood system, injury, damage and destruction of immobile infrastructure, disruption to essential services, National economic loss, evacuation, and loss of human lives and biodiversity, displacement and sufferings of human population and

		biodiversity.
Cyclone and Storm surge	Coastal areas and offshore islands	Loss of agricultural production, disruption of communication and livelihood system, damage and destruction of immobile infrastructure, injury ,national economic loss, loss of biodiversity and human lives, need for evacuation and temporary shelter.
Tornado	Scattered areas of the country	Loss of human life and biodiversity, injury, damage and destruction of property, damage of cash crops, disruption in lifestyle, damage to essential services, national economic loss and loss of livelihood.
Drought	Almost all parts of the country particularly the northwestern part	Loss of agricultural production, stress on national economy and disruption in life style.
Erosion	Banks of the the	LOSS of land,

	Ganges- Padma and the Meghna river systems	displacement population and livestock, disruption of production, evacuation and loss of property.
Landslide	Chitagong and chittagong hill tracts	Loss of land, displacement of human, population and livestock, evacuation, damage of property and loss of life.
Earthquakes	Northern and central parts of the country	Damage and destruction of property, loss of life and change in geomorphology.

Source: BANCID, 1995 Dhaka

4.2. In general terms, typical effects of disasters tend to be:

1) Loss of life

2) Injury

3) Damage to and destruction of property

4) Damage to and destructions of subsistence and cash crops.

5) Disruption of production

6) Disruption of lifestyle.

7) Loss of livelihood.

8) Disruption to essential service

9) Loss of livestock

10) Damage to national infrastructures and disruption to governmental system.

11) National economic loss

12) Sociological and psychological after effects.

4.3. Flood

Bangladesh is one of the largest deltas in the world. Bangladesh is one of the most flood prone countries in the world, which is situated in South Asian sub- continent. Because of its unique geographical location and topography, flood of different magnitudes and types occurs every year. During the last half century at least 8 numbers of extreme flood events occurred affecting 50% of land area. Since early sixties of the last century the country has adopted different kinds of measures for flood management with mixed experience.

The flood problem in Bangladesh is extremely complex, since the associated reasons are many; the country is an active delta it has extensive flood plains into which about 1.72 million sq. k. m. drain and it has an extensive network of rivers and canals. The country has an average rainfall of about 2500 mm. The range being 1500 mm in the west to over 5000 mm in the north east. Floods occur in Bangladesh almost every year and the devastating ones in every 5 to 10 years.

Flood affected area during extreme Hydrological years affected area:

Year	sq.km.	Percentage
1954	36800	25
1955	50500	34
1974	52600	36
1987	57300	39
1988	89970	61
1998	100250	68
2004	55000	38

Source: CEGIS

Hydrology

Bangladesh has unique hydrological regime. It has been divided into 7 hydrological zones. Hydrological zones are shown in fig. 2. It has 230 nos. rivers of which 57 are trans-boundary Rivers. In all most all cases Bangladesh is a lower riparian country. A picture of its river network is also given in the fig. 1. Three large rivers systems e.g. Ganges, Brahmaputra and Meghna, in the world covering a combined total catchments area of about 1.7 million sq. km. extending over Bhutan, China, India and Nepal, flow through this country. Out of these huge catchments only 7% lies in Bangladesh. Rivers are classified three broad categories depending on the flow range and are as follows:

i) Major Rivers: 300 to 120,000 curnec e.g Ganges, Brahmaputra,Padma, Meghna

ii) Semi major Rivers: 100 to 15000 cumec e.g. Old Brahmaputra, Dhaleswari, Gorai, Arial Khan, Surma, Kushiyara, Teesta etc.

ii) Minor River: 1 to 1000 cumec e.g. Sitalakhya, Buriganganga, Khowai, Manu, Gumti, Dharla, Dudkumar, Kamafuli, Halda, Sanguelc etc.

Fig: Location of Bangladesh

Rivers of different morphological characteristics e.g. meander, braided, incise etc. are found in this country. Major rivers having length of 500 to 2500 km and width range from 1 km to 20 kin can also be found in this country. Water surface slopes of the major rivers are also very flat e.g. av. slope of Ganges is 5-6 cm/km, av. slope of Brahmaputra is 8-9 cm/km and av. slope of Meghna is 4-3.5 cm/km.' Annual flow volume of the rivers is to the tune of 1200 billion cum. Rivers of Bangladesh carries huge sediment annual amount of which is between 1.8 to 2.0 billion tons.

Types of Flood

Bangladesh generally experiences four types of flood and those are as follows:

1) Flash Flood

2) Rain Fed Flood

3) River Flood

4) Flood due cyclonic storm surges

Flash Flood

This type of flood is characterized by rapid rise and fall in water levels. Flash flood can occur within a time-period between few minutes to few hours. This type of flood occurs mostly in some northern most area, north-central part, northeastern part and southeastern part of the country. Northern most, north-central and northeastern parts land areas are lying mostly at foothills but most of the hilly catchments in India. If it rains heavily in the Indians parts of the catchments the run-off quickly accumulates and flow to Bangladesh. Flash flood starts occurring in these areas from mid-April i.e. before the onset of the southwesterly monsoon. Whereas, in the southeastern areas it starts with the onset of the southwesterly monsoon.

Rain-fed Flood

This kind of flood generally occurs in the moribund Gangetic deltas in the south-western part of the country where most of natural drainage systems are being deteriorated due to fall in up-Land inflow from the main river Ganges. It also occurs in the flood plains where natural drainage systems have been disturbed due to human interferences mainly due to construction of unplanned rural roads and illegal occupation of river curses.

River Flood

The word flood is generally synonymous with the river flood. River flood is a 4fiost common phenomenon in the country from time immemorial. Normally, 25-30% of the area is inundated during monsoon season along the river. In case of extreme flood events 50-70% of the country are inundated extending the areas far beyond the riverbanks. The worst floods experienced by the country m Fast Mears in 1987, '88 and '98. Flood of 1998 was the severest one in terms of magnitude and duration.

Year	Flood Affected area		Year	Flood Affected area		Year	Flood Affected area	
	Sq-Km	%		Sq-Km	%		Sq-Km	%
1954	36,800	25	1975	16,600	11	1995	32,000	22
1955	50,500	34	1976	28,300	19	1996	35,800	24
1956	35,400	24	1977	12,500	8	1998	1,00,250	68
1960	20,400	19	1978	10,800	7	1999	32,000	22
1961	23,800	20	1980	33,000	22	2000	35,700	24
1962	37,200	25	1982	3,140	2	2001	4,000	2.8
1963	43,100	29	1983	11,100	7.5	2002	15,000	10
1964	31,000	21	1984	28,200	19	2003	21,500	14
1965	28,400	19	1985	11,400	8	2004	55,000	38
1966	33,400	23	1986	6,600	4	2005	17,850	12
1967	25,700	17	1987	57,300	39	2006	16,175	11

Year	Flood Affected area		Year	Flood Affected area		Year	Flood Affected area	
	Sq-Km	%		Sq-Km	%		Sq-Km	%
1968	37,200	25	1988	89,970	61	2007	62,300	42
1969	41,400	28	1989	5,100	4	2008	33,655	23
1970	42,400	29	1990	3,500	2.4	2009	28,593	19
1971	36,300	25	1991	28,600	19	2010	26,530	18
1972	20,800	14	1992	2,000	1.4	2011	29,800	20
1973	29,800	20	1993	28,742	20	2012	17,700	12
1974	52,600	36	1994	419	0.2	2013	15,550	10.6

Source: BWDB, GoB

Year-Wise Flood Effected Area in Bangladesh

Flood due to Storm Surges

This kind of flood mostly occurs along the coastal areas of Bangladesh which has a coast line of about 800 k.m. along the northern part of Bay of Bengal. Continental shelf in this part of the Bay is shallow and extended to about 20-50 km. Moreover, the coastline in the eastern portion is conical in shape. Because of these two factors, storm surges generated due to any cyclonic storm is comparatively high compared to the same kind of storm in other parts of the world.

Causes of Flood

Flood in Bangladesh are caused by combination of factors (GOB/GOI 1990; BANCID 1995). These are.

- Huge flow generated by rainfall occurring in the upstream catchments and consequent over spilling of them main rivers;
- Runoff generated by heavy local rainfall that cannot drain out due to high stages of the Outfall Rivers;
- Synchronization o peak flows in the major rivers causing drainage congestion in the mouth;
- High tide in the Bay of Bengal occupied with wind caused by southwesterly monsoon winds that obstruct drainage of the upland discharge;
- A low gradient of the floodplain that that prevents quick recession of excess water;
- Excessive salutation in the river channels reducing the carrying capacity and
- Storm surge due to tropical cyclones in the bays of Bengal.

Flood Management strategies:

Flood Management strategy has been under continuous change since early sissies of the last century. Flood Management strategies can be divided into three distinct phases of its development, which are as follows:

2) Phase-1: 1960 to 1978

3) Phase-11: 1978 to 1996

4) Phase 111: 1996 to 2000 onwards.

Flood mitigation measures

Structural measures

Many conventional flood mitigation measures like flood control reservoirs flood diversions or flood by passes are not feasible within Bangladesh because of its extreme flat topography. The flood control measures in this floodplain country have been based mainly on the construction of earthen embankments parallel to the river banks. In general the following flood control and drainage approaches have been exercised in Bangladesh.

1) Protection against monsoon river flooding

2) Protection against pre monsoon river flooding

3) Gravity drainage to reduce rainfall flooding

4) Pumped drainage to prevent rainfall flooding

5) Dredging of rivers and canals

Non-structural measures Flood forecasting and warning

The Flood Forecasting and Warning Centre (FFWC) of Bangladesh Water Development Board (BWDB), established in 1972, are responsible for river flood forecasts and Hood warnings during the flood season. At present, the FFWC issues river stages forecast for 21 stations on major and medium rivers where slowly rising floods occur, formulated for lead times of 24 hours, 48 hours and 72 hours. The Bangladesh Meteorological Department (BMD) is responsible for forecasts and warnings of tropical cyclones and storm surges from the Bay of Bengal.

Flood Preparedness

In Bangladesh, there "is an institutional arrangement for flood preparedness under a National Guideline called 'Emergency Standing Order for Flood'. It outlines the actions of flood preparedness to be taken up by a large number of ministries (Ministries of Disaster Management and Relief, Water Resources, Agriculture, Information, Health, Public Works, Local Government, Communication and Defense), subordinate agencies, local councils and non-government organizations (NGO) in the three defined phases via before, during and after floods. The overall flood management programmes are coordinated by a National Coordination Committee. The recently formed Disaster Management Bureau under the Ministry of Disaster Management and Relief is entrusted with the task of executing action programmes at the grass roots level. Nearly 21,000 volunteers of the Bangladesh Red Cosecant Society take part in the flood preparedness programmes in the storm surge flood-prone areas in the coastal region.

Flood proofing

Flood proofing of homesteads is a traditional precaution in the rural settlements bra Bangladesh. Homesteads arc generally raised above maximum flood levels. Recently a Bangladesh National Building Code (1993) has been prepared which; stipulates that any area having a potential for being flooded to a depth of at least 1 meter should be designated as a Flood Prone Area (FPA). The Code specifies that the lowest floor, including the basement, of any building located in the FPA shall not be located below the design flood level, and the roof of one or two storey buildings and the floor immediately above the design flood level for three or more storey buildings shall be accessible via an exterior stairway. Cyclone shelters are constructed in the coastal zone where human lives arc at high risk due to cyclonic storm surge Hoods. Shelters stand on stilts so that flood water can pass through. Earthen mounds are constructed for ovine/bovine protection. Currently there are about 1,500 cyclone shelters (Sener, 1995). The Multipurpose Cyclone Shelter Master Plan (BUET and BIDS, 1993) estimated that 2,500 new shelters with an accommodation capacity of 4.4 million persons would be required. Over the years, there has been a significant change of emphasis from designing the shelters solely for use as Hood shelters to designing them for multipurpose use. Shelters are now designed as schools, health centers and other community service centers for normal time use.

ENVIRONMENTAL IMPACTS OF FLOOD (CONTROL PROJECTS

a) Impact on physical environment

b) Impact on ecological environment

c) Impact on human environment

4.4. Earthquake

Bangladesh is a part of the Bengal basin which is one of the most seismically active zones of the world. Lying as it does in the confluence of the India, Burma and Eurasia plate; the land is extremely prone to earthquake disasters and in the past have experiences some of the worst earthquakes in the history. However, a relatively long period of "rest" from any major hazards and high attention paid to other disasters such as cyclones, floods, etc. have led to both neglect and denial of earthquake as the most destructive of all natural disasters.

Although the world experiences millions of earthquakes every year, few are felt because of their low intensity and magnitude. In general there is a severe earthquake every year (more than 8), 10 large quakes and 100 moderate quakes. The movement of the earth's plates: which forms the thin outer shell of the earth's crust causes earthquake? Bangladesh is in such a location. The point of origin for quakes within the earth is called focus and the point immediately above the focus is called the epicenter. Shallow earthquakes occur 70 km. below the surface while deeper ones happen 600 km. below.

The two measures for earthquakes are intensity Magnitude measures the energy released which are generally based on the Richter scale measurements. Intensity measures the scale of damage. So an earthquake

of the same magnitude may have (different intensities depending on the havoc caused.

Seismic Zones in Bangladesh and their Earth quake potential zones:

Zones	Operational Basis Magnitude (Richter)	Max. Magnitude Richter)	Creditable Dept of Focus (Km)
Asam-meghalya fault Zone	8.0	8.7	0-70
Tripura Fault zone	7.0	8.0	0-70
Sub-dauki fault Zone	7.3	7.5	0-70
Bora Fault zone	7.0	7.5	0-70

Source: DMB

4.5. Drought in Bangladesh

Drought is an abnormal condition where there is lack of sufficient water to meet the normal needs of agriculture, livestock, industry, or for human use. While generally associated with semi-arid or desert climates, drought can also occur in areas that normally enjoy adequate rainfall, and moisture levels. Drought is the result of insufficient or no rainfall for an extended period, and causes a considerable hydrological (water) imbalance. The ensuing water shortage leads to stream flow reduction, depletion of ground water and soil moisture, and hence, crop damage. In drought conditions, evaporation and transpiration exceed normal levels. If it continues for a prolonged period,1 a serious threat is posed to agricultural production. In

agricultural context drought affects the rice production most. Due to drought severity, crop loss ranges between 20-60 per cent for T. Aman and other rice1. It is one of the most insidious causes of human misery,

Basically, there are three types of droughts

- Permanent drought characterizes regions with the driest chlorinate, having sparse Vegetation that is adapted to aridity. Agriculture cannot be practiced without irrigation.
- Seasonal drought occurs due to abnormal rainfall shortage in places where icier are well-defined annual rainy and dry seasons.

Drought conditions due to deficiency in rainfall affect different parts of Bangladesh mostly during the pre- Monsoon depressions that form in the Bay of Bengal move landward, and cause monsoon rain to be spread widely throughout the country.

Drought severely affects crop output in Bangladesh. Because of non-Availability of relevant data, the figures on the annual drought-related loss of crop production cannot be presented except for the 1982 drought. The total loss of rice production due to drought in 1982 was 52,896 metric tons (BBS 1986, 287-90). This accounted for about 41% of the total damage caused by all types of environmental hazards (cyclones, hailstorms, heavy rains, floods, and drought) that occurred in that year. The 1982 flood damaged about 36,000 metric tons of rice, much lower than the damage: done by drought.

Drought adversely affects all three rice varieties (aman, aus, and boro) grown in three different cropping seasons in Bangladesh. It also causes damage to jute, the country's main cash crop, and other crops such as pulses, potatoes, oilseeds, minor grains, winter vegetables, and sugarcane.

Rice alone accounts for more than 80% of the total cultivated land of the country. Droughts in March-April prevent land preparation and plowing activities from being conducted on time. As a result, broadcast aman, aus, and jute cannot be sown on schedule. Droughts in May and June destroy broadcast aman, aus, and jute plants. Inadequate rains in August delay transplantation of aman in high land areas, while droughts in September and October reduce yield of both broadcast and transplanted man and delay the sowing of pulses and potatoes. Boro, wheat, and other crops grown in the dry season are also periodically affected by drought. Fruit trees, such as jackfruit, litchi, and banana, often die during drought. But the loss of rice production is the most costly damage incurred by droughts in Bangladesh.

The Impact of drought spreads disproportionately amongst regions of Bangladesh. There is a popular impression in Bangladesh that the northwestern districts of Rajshahi, Dinajpur, Rangpur, Bogra, and Pabna are particularly drought-prone (Murshid 1987, 38). The northwestern districts are relatively dry, receiving only 50 inches of rainfall annually. The eastern districts, in contrast, receive more than 80 inches of rainfall. But drought can hit both prone and non-drought-prone areas (Murshid 1987, 38; Paul 1995).

4.6.Cyclone

Bangladesh lies in the path of tropical cyclones and has a wide and shallow continental shelf which is particularly vulnerable to cyclone. As a result, the coastal area of Bangladesh have been ravaged by tropical cyclones associated with tidal surge almost every year, Particularly in the pre monsoon months of April May and post monsoon months of October and November. Among the many natural disasters affecting Bangladesh, cyclones are surely the worst because they cause internees damage and

there are no mitigation features as such to counter them. It is estimated that about ten thousand lives have been lost due to floods over the past forty years whereas the loss of lives from cyclone has been close to half a million in the same period. Damage of livestock and other assets (trees houses etc.) Have been that much greater (Rashid. 2001).

Cyclone

As regards the impact of cyclones out of its three accompanying effects of heavy rain strong wind and storm surge it is the storm surge of tremendous height and force. Which causes most of the damage including loss of human loves and livestock from 1960 to 1998, a total of 47 cyclones of different magnitude struck the coastal area of Bangladesh. Of these the cyclones of 1970 1985, 1988 and 1991 registered storm surges of height 10.0 4.5, 44. 7.6 m respectively and have made worst history in respect of human casualties and property destruction. The cyclones of 1970 and 1991 claimed 300.000, people and one million cattle hands; 150,000 people and 70,000 cattle heads respectively and there 'were wide spread damage

production 'and property. The estimated loss in monetary terms was Taka 42 billion (Kelly and Chowdhury, 2001).

Cyclones kill people and livestock destroy crops, damage Infrastructure houses and vital installations and cause wide spread health hazards. Apart from short-term problems, storm- surge creates long-term problems because the salt water makes the soil unproductive. The impact of cyclones, with frequent occurrences and substantial magnitude, on the marginal landowners and landless people happens to be tremendous. These affect livelihood assets and seriously challenge the efforts of the country towards self-reliance.

Cyclones, in the coastal region have occurred from time immemorial, but it is only recently i.e. from early 1960s, that some "efforts are being made to mitigate" the sufferings and- loss of life and property caused by them. The major efforts are prediction and dissemination of warning systems, construction of infrastructures like shelters, coastal forestation, creating awareness' among the people to use the given facilities at the time of emergency, immediate post disaster relief and educating the vulnerable

people to take necessary measures initiating from own and community level in saving life during cyclone and facing the post disaster emergency crisis and salvaging the livelihood.

From the experience after 1991 cyclone, Akhter (1992) mentioned that during the post- cyclone period, free distribution of relief and reconstruction undertaken by organizations, tended to make the community irresponsible and unwilling to participate in the rehabilitation process. She also emphasized that it is important to ensure a proper work attitude rather than create dependencies. After the 1991 cyclone, literacy was found to be inversely related to death rates. Since literacy is a proxy for socio-economic status, this observation confirms me it Is always poor in the society and the economically disadvantaged who suffer more, even in a natural disaster.

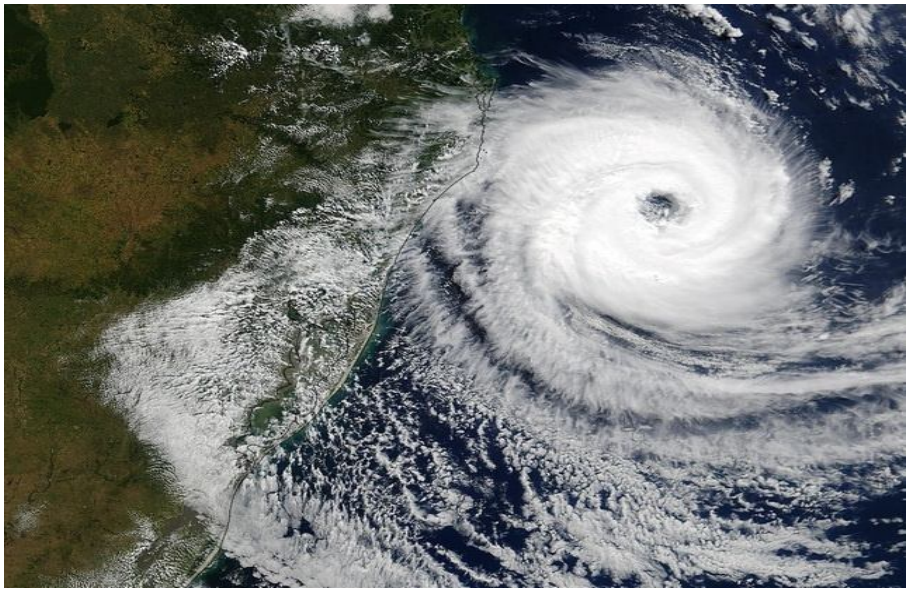
Experience from the 1995 cyclone shows that different community based disaster preparedness programmes implemented by incorporating various indigenous practices like storing food, water and other necessary items organized by the Bangladesh Red Crescent Society, donors and NGOs for realizing facilities like shelter kills and proper dissemination of warning on time showed a more effective positive impact on the community is saving life and rejuvenating the livelihood in the post disaster period than providing only relief and infrastructure.

Cyclone Sidr

Sidr, a tropical revolving storm, commonly known as cyclone in this part of the world sidr was one of the 10 fiercest cyclones that had hit the region of Bangladesh in the 131 years between 1876 and 2007.

Bangladesh is one of the most disaster hit countries of the world. As the world climate is changing fast because of global warming caused by

industrial pollution by rich countries Bangladesh will remain vulnerable to natural calamities like sidr and other types of cyclone. Scientists also fear that the low lying areas of Bangladesh will go under the sea level within the next 50 years due to greenhouse effect this will be a great concern for Bangladesh.



Sidr: 15 November, 2007.

Sidr The world sidr originates from the official language of srilanka Sinhalese is commonly understood as eye. Certainly the sidr does not look like the eyes of the beloved ones the loves may look at for hour together to find out and relish the elixir of life. The sidr the terrible eye, had rushed with great signal number 10 and smashed the entire southem districts on the fateful night of November 15, 2007.

- Sidr at a glance
- Sidr in the Bay of Bengal
- Formed November 11,2007
- Dissipated November 16,2007
- Highest winds-215 km/h (130 mph) (3- minute sustained)

- 250 km/h (155 mph) (1 minute sustained)
- Lowest pressure 944 hPa (mbar)
- Fatalities>447
- Damage $ 450 million (2007 USD)
- Areas affected 9 district in Bangladesh

1. Satkhira
2. Bagherhat
3. Khulna
4. Jahlokhati
5. Barguna
6. Pirojpur
7. Bhola
8. Patuakhali and
9. Barisal

Damage of Sidr

The damage of the sidr is not very easy to measure. But no doubt. some of the damage is irreparable.

Death Toll as at 9.20 is on 31-12-3363

- Missing Persons 871
- Total Affected Districts 30
- Worst affected Districts 04
- Badly affected Districts 08
- Moderately Affected Districts 18
- Affected Upazila 200
- Affected union Municipality 1950

- Affected family 20,64,026
- Affected People 89,23,259
- Injured Persons 55,282

(Source: BBS 2008)

Month	Year	Max. Wind Speed (km/h)	Storm Surge Height (metre)	Human Deaths
October	1960	210	4.5-6	5149
May	1961	146	2.5 3	11466
May	1963	203	4-5	11520
May	1965	162	3.5	19279
December	1965	210	4.5-6	-
October	1966	146	4.5-9	850
November	1970	223	6-9	500000
May	1985	154	3-4.5	11069
April	1991	225	6-7.5	138000
May	1994	200	-	170
May	1997	225	2.5-4	126
November	2007	223	3-4	3363
May	2009	92	3+	190
May	2013	88	1.5-2	17

Source: Nizamuddin, 2001

Severe Cyclones Affecting Bangladesh since 1960

4.7. River Bank Erosion

In Bangladesh river bank erosion is one of the most important natural hazards which causes widespread damage to man made his habitat A substantial area of Bangladesh is prone to be affected by river bank erosion. The major factors responsible for river bank erosion are rapid and fall in the water level high variation in the maximum and minimum discharge high rate of sedimentation and scouring in the bed material formation and movement of large bed forms soil condition of bank materials and flow pattern and deflection currents towards the bank line.

Besides submerged islets discharge capacity of the channels and waves are also responsible for river and erosion (Ahmed et-al. 1994).

River Bank Erosion

Land loss due to river bank erosion is the highest in the Jamuna the erosion rate is estimated to be between 139 and 353 hectares per year. Channel shifting is a major outcome of river erosion. During the last 200 years, the Jamuna has shifted laterally about 19 km and the Teesta by 17 km. The Ganges-Padma has migrated eastward during the last 400 years leaving a number of right bank distributaries. Land erosion in the coastal region caused by rivers, sea waves and tide is also significant. Bhola has suffered a net land loss of about 227 sq km in the last 50 years, hatiya was reduced

fro over 1.00 to only 21 sq. km in (Ahmed et al 1994). As per the reeorded report 125.935 acres of agricultural aland and 4.084 house fell into the rivers due to corrosion in 1997 (Disaster forum, 1997).

Bank erosion in various rivers

Name of the Rivers	Number of Location	Length of erosion km.
Brahmaputra- Jamuna	38	160
Ganges-Padma	30	94
Meghna	6	13
Teesta	8	35
Minor Rivers	18	31
Flash and other rivers	165	78
Tridel rivers	18	83

Source -CEGIS

As per BWDB, erosion Traits at 242 identified sites along the banks of 77 rivers in 210. upazilas of 58 out of 64 districts. About 1200 km of river bank erodes and about 8,700 hectares of land are washed away every year. About one million people are. Directly or indirectly .affected by river bank erosion every year in Bangladesh. A field-based research shown that within the period of July 1998 to June 1999 about 18,000 people, from 39 villages of Chilmariupazila alone, living along the river Jamuna were directly affected by river bank erosion (Islam, et al.,'2001). Erosion affects the rich as well as the poor. The poor, however, are affected more. The marginalized victims of riverbank erosion lose their homes, land and livelihood and become helpless with little resources. The majority of them find some place in the neighborhoods to live but an increasing number are migrating to the cities and ending up in the urban slums and squatters. With persistent erosion, the loss and damage to properties, roads and human habitation in general, are remarkably high. The material consequences are short range as economic recovery is possible within a predictable time. But the socio- economic impact and demographic

dislocation due to bank erosion are mostly permanent and most often long-term (Halli, 1991; Rogge, 1991). Although the affected people try o make an adjustment to the new (often hostile and unfavorable) environment their standard of living falls far behind from what they had enjoyed before.

4.8. Arsenic Contamination of Ground Water

Arsenic dissolved in fresh water is common all over the world. It becomes a serious problem when there is much that it adversely affects the human physiology. Bangladesh has recently acquired a new form of calamity: dangerous level of arsenic in ground water, the principal source of water used for drinking and cooking in the country. Arsenic is a toxic and carcinogenic substance that attacks internal organs, produces Gangrene and a number of concerns affecting the skin, lungs, liver and bladder. WHO considers 10 parts per billion to be the maximum allowable amount of arsenic in drinking water? Bangladesh authorities consider this limit to be 50 parts per billion (Rashid, 2001).

The oxidation of ferrous hydroxides rich in arsenic presents the Bengal Delta sediments may be responsible fox1 the release of arisen, in solution to the groundwater. The subsequent migration of the arsenic contaminated groundwater through these deltaic sediment;, may be one of the principal causes of arsenic poisoning in Bangladesh, Arsenopyrite and ferrous hydroxides would be stable in the reducing environment below the groundwater table. If the groundwater table was lowered by over pumping of water for drinking and cooking purpose and increased irrigation during the dry season and the sediments exposed to the oxygen of the atmosphere, these arsenic rich minerals would oxidize releasing arsenic (Bridge and Husain, 2000).

The problem of arsenic contamination in the ground water of Bangladesh is a crisis of unprecedented proportion. Millions of people in rural Bangladesh are now exposed to the risk of arsenic poisoning. So far known, out of 64 districts, 59 districts covering an area of about 65.000 sq. km have been found to be affected by arsenic pollution.

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The oxidation of arsenopyrite or ferrous hydroxides rich in arsenic present the Bengal Delta sediments may be responsible for" the release of arsenic, oxides in solution to the groundwater. The subsequent migration, of arsenic contaminated groundwater through this deltaic sediment: may be one of the principal causes of arsenic poisoning in Bangladesh. Arsenopyrite and ferrous hydroxides would be stable in the reducing environment below the groundwater table. If the groundwater table was lowered by over pumping of water for drinking and cooking purpose and increased irrigation during the dry season and the sediments exposed to the oxygen of the atmosphere, these arsenic rich minerals would oxides releasing arsenic (Bridge and Husain, 2000).

The problem of arsenic contamination in the ground water of Bangladesh is a crisis of unprecedented proportion. Millions of people in rural Bangladesh are now exposed to the risk of arsenic poisoning. So far known, out of 64 districts, 59 districts covering an area of about 65,000 sq. km have been found to be affected by arsenic pollution in the Tube-well water, particularly in the shallow aquifers on which about 97 per cent of the people are dependent for drinking water. About 75 million people are autism of arsenic disaster (Alam, 2000 and Karira, 2001; Chowdhury, 2001).

Ironically, the arsenic contamination in drinking water in Bangladesh is the result of the safer water-drinking program mounted by the UNICEF. The villagers were weaned away from the traditional use of surface water for drinking and cooking as surface water was declared to be the source, of deadly microbes and bacteria conducive to life-threatening pathogenic diseases. The UNICEF and other donors assisted the government to sink pipes into underground- aquifers for clean groundwater. Presently, out of 5 million such tube-wells, 3 million may be contaminated with arsenic (Karim, 2001). Excessive use of ground water for drinking, cooking and irrigation by installing thousands of shallow and deep tube-wells led to withdrawal of enormous quantity of .groundwater from various underground aquifers without allowing the chance to refill, causing gradual dewater rig of the basal sand, which caused air to enter. In addition, dropping of water level facilitated further exposure of the arsenic rich beds to air. Collectively, these happenings have caused the underground aquifer to become aerated and have changed the anaerobic environment to aerobic one.

Arsenic is "a silent killer in the rural areas of Bangladesh and has emerged is a Drano public health problem of "the country. It is very "hard to estimate the total number of arsenic patients in Bangladesh. However,

about 1.2 lakhs'0.001 per, cent of the population) are clinically expose's to arsenic sis disease (Bhuiyan, 2001) and sub clinically the figure may be 10 time higher. The figure may rise gradually with respect to time and spatial dimensions. So public health is in jeopardy in areas where arsenic contamination is extensive.

Ministry of Health and LGRD have undertaken a number of short-term and long-term programs to mitigate the arsenic contamination problem. Many national and international NGOs and Agencies have also undertaken many programs and activities to mitigate the problem. The government launched a campaign for creating awareness among the people about the hazards of drinking arsenic contaminated water by issuing warning through public media like radio and television. However, the massive job of screening majority of the tube-well for the contamination is yet to be undertaken. Measures should be undertaken to find out the alternate arsenic safe water options, which would-be sustainable, acceptable, feasible and affordable by the community.

Chapter five:

Disaster and Gender Perspective

5. Disaster and Gender Perspective

When disasters strike, the most vulnerable are women and children especially those women who are household heads and those children who live in single parent families, Disaster affects both men and women but it has a gender dimension. The disaster related problems affect rural women more severely than men because of the wider responsibilities they have for their households more strictly than the male members. Saleheen "and Huda (2001) have identified three principal reasons for this vulnerability; low status of women in the family and society, lack of awareness and the physical nature of women. The 1991 cyclone surge immediately killed 40-59 per cent of the children. 25-30 per cent of the women and 15-20 per cent of the old people in the affected area. In Kutubdia, about 85 per cent of all dead bodies were of women and children (BCAS, 1991).

5.1. Most vulnerable group:

Natural disaster frequently occurs the world, affecting both developed and developing countries. However, some populations are clearly more vulnerable than others. Different communities and countries are more susceptible to the impacts of hazards. The vast majority of lives both lost and affected by natural disasters come from developing countries, underlining the link between poverty and vulnerability to disaster.

Many developing countries are particularly vulnerable to natural disaster such as flood, cyclone and earthquake. And like many human natural disasters, extreme weather events affect certain populations disparately and unfairly. This is not purely down to economics, but also age and gender play a large part as does the environment that people live in. It has been

noticed that, women, children, elderly, people with disabilities and pregnant women are more vulnerable than other sections. During disaster they are left behind to leave increasing of emergency because they have lack of knowledge, mobility and resources. That means aging people, women and children are most vulnerable groups in natural disasters. This is the real picture in every society. Although it is depends on actual situation, it is varies from country to country, society to society.

5.2. Women and children:

Detrimental effects of climate change can be felt in the short term through natural hazards, such as flood, landslides, and cyclone and tidal surge in the long term, through more gradual degradation of the environment. The adverse effects of these events are already felt in many areas, including in relation to inter alias, agriculture and food security, bio-diversity and eco-system, water resources, human health, human settlements and migration patterns, energy, transport and industry.

In many of this context, women are more vulnerable to the effects of climate change than men. Women are particularly vulnerable when it comes to humanitarian or natural disasters, the issue relating to their specific needs tend to be overlooked or excluded as a disaster unfolds.

Furthermore, they face social, economic and political barriers that limit their coping capacity. Women and children in rural areas are especially vulnerable when they are highly depending on natural resources for their livelihood. It is important to remember however, that women are not only vulnerable during disaster, but they are also effective actors or agents of change in relation to both mitigation and adaptation. Women often have a

strong knowledge and expertise that can be used in climate change mitigation, disaster reduction and adaptation strategies.

Women are supposed to be the most vulnerable for many causes namely their vulnerability, mental attitude, physical structure and other social issues (Mitchell 2007). There exists a lot of problems and lacking in disaster management. Though the vulnerable women in coastal areas are not getting proper support from the Government and non-government authorities, their indigenous coping capacities are appreciable. Due to disaster women have to migrate from their residence to different metropolitan cities. It increases different urban problems like unemployment, criminal activities, traffic jam and slum problems. People live in a society where women and children are the most vulnerable groups. During disaster, this vulnerability increases. Though, disasters do not discriminate. The socially constructed role of women makes them the vulnerable groups during disaster. Because women have less access to resources, they are victims of gender division of labors, they are primarily responsible for domestic duties and they do not have the liberty of migrating to look for work following a disaster (World Bank2005). The differentiated impact of disasters on men and women is primarily caused by the existing gender inequalities manifested. A study conducted by London school of Economics shows, taken a sample of up to 141 countries over the period 1981 to 2002 natural disasters and their subsequent impact, on average kill more women than men or kill women to earlier age than men related to socio-economic status(New mayer and Plumber 2007). Women tend to have more limited access to assets, physical, financial, human, social and natural capitals such as land, credit, decision making bodies, agricultural inputs, technology, extension and training services

which would all enhance their capacity to adopt. And in the coastal areas situation is worst.

Women often face additional physical insecurity and loss of dignity while collecting relief during or after disaster. Women's vulnerability is further increased when a male head of the household dies. In addition, women are vulnerable to reproductive and sexual health problems. For women, new dangers include sexual violence and sexually transmitted infections. And in the chaos and displacement that is the aftermath of a natural disaster, child abuse and neglect, violence against a partner and exploitation and trafficking are likely to increase.

5.3. Coping strategies:

The word coping strategies means the ways or means the people adopt by their knowledge and experience in different phases of a disaster situation.

Although women are usually at greater risk than men, it is the women who make it possible for the community to cope with disaster. The role of women is absolutely central to the management of disaster-coping strategy. Now, there is general agreement on that women are active environmental stewards, particularly in South Asia. Women constitute a rich depository of traditional and indigenous knowledge regarding the environment and their skills in coping with disasters are often remarkably efficient. The vast wealth of women's knowledge of traditional and local methods of coping with disasters should not be undermined or ignored. This is being used by the disaster stricken society as livelihood strategies for surviving disasters.

The women, as the manager of the household, irrespective of socio-economic status, play a significant role in the management and preparedness for pre-, during and post-disaster situations. They take various measures to save lives of the family members, specially the children, and the elderly and sick persons. They keep themselves ' - prepared with the materials required to save the lives of the family members and protect household items. Often, they make arrangements to save children and elderly persons during disasters. Pregnant women are at great risk during a disaster. They need to get special care not only from the family members but also from the other women of the Community. These women should also remain prepared with their first aid equipment and materials including the oral saline and other necessary materials.

Women traditionally are responsible for preparation and management of food for the household members. As part of this responsibility they take preparation long ahead of disasters, not only in view of the family members but also the poultry and livestock. They preserve dry readymade food for emergency and also make arrangements for cooking by preparing movable burners and collecting and preserving fuels. They preserve cereals, vegetables and other dry food items too. Women also preserve kerosene, matches or lighters, lamp and hurricanes for emergency lighting.

Preparation is also & kens for post-disaster rehabilitation by preserving seeds for field crops and preparing seedlings for homestead gardening. Women also remain prepared to process the emergency harvest. They carry their poultry and livestock if necessary and they keep themselves ready for that by preparing baskets for poultry and rafts for livestock.

Women try to serve, clean drinking water to the family members .either by, collecting it. From -far away tube-wells or by boiling the available water or

using purifying tablets. However, women suffer most for near reasons, among them for lack of public conveniences during disasters, especially during floods. Pregnant women and lactating mothers and trebles suffer most. Sometimes their suffering continues long after the disaster.

As the manager of the homestead she plants many types "of plants and trees around the homestead, which are useful in normal times, during, disasters as well as in post-disaster periods. As long-term planning for repairing the homestead, they collect and stock clay soil from the fields during the dry season and do the repairing; work and cleaning of the homestead in the post-disaster period.

Various natural disasters in the form of cyclones floods or tidal bores strike Bangladesh almost every year. Vast areas are often devastated by floods causing much damage crops and houses. Tidal bores hit the coastal area occasionally causing total destruction of an area and deaths to hundreds of thousands of people. None of these hazarded in new but in recent .years there have been some significant developments. On the other hand the potential for loss of life is increasing as population perjure forces to people to occupy more marginal and exposed land on the other hand sophisticated satellite communication systems now offer better warnings of imparting climate shocks and the country should generally be prepared to cope with emergencies and to mitigate their impact. In recent years the greatest losses of life and property have come from floods and cyclones. The flood of 2000 and 2004 is not found in available area. So unprepared ness she of people about this suffered them much. At this time women and children are often most helpless victims. This is not surprising because even in normal situation the constitution of the two most vulnerable groups in the society.

5.4. Women Vulnerability to Crisis Events

Natural hazards: Vulnerability to flood and other natural hazards also ranked second. This was only natural as even during normal floods, water reached their homesteads. Waves battered the foundation of their homesteads and they lived in constant fear of their homestead being washed away. Fear was a constant companion of those living on the retired embankments, as the embankment itself could at any moment be washed away by pounding waves. Women complained that their dwelling units provided inadequate shelter. As they were poor, their dwellings were not strongly built. These were in constant need to repair but they could not afford it. Neither did they have the manpower, nor the money to do so. During heavy rain and storms, they had to take shelter in their neighbors' houses.

Illness: These households were especially vulnerable to disease and sickness. Inadequate income meant their families were malnourished. Low quality living environment and poor housing condition meant they were more exposed to the elements of nature. This was why illness and inadequate access to medical care ranked as the third most important problem cited by them.

Insecurity of life and property: The respondents observed that they suffered from insecurity of life and property. Although the embankments were built on land acquired by the government, previous owners of those plots threatened them with forced eviction if they did not pay them rent. There was social conflict between the embankment dwellers and the villagers who had previously owned the land. Petty theft was common in the area and drug addiction and criminal activities were also cited as

reason for insecurity. They were also under constant threat of eviction from the BWDB authorities.

Education of children: Women-headed households also faced difficulty in sending their children to school. The children had no incentive to attend school regularly. The government's program of food for education was not in force in many of these schools and women headed households being poor, needed the supplementary income their children could earn. Many children worked as domestic help in the homes of other people. For this they were given food and clothing and for the family this meant one less mouth to feed.

Lack of privacy: Amongst other problems cited, lack of privacy and difficulty in obtaining potable water were very important. As these households were poor, they could not afford to build proper latrines. As such, most of them had to go to the fields or chars to relieve themselves in the early hours of the morning or during the night. Many had to walk to the river for bathing and washing and collect water for drinking from tube wells, which were not many in numbers.

Difficulty in obtaining fuel: Households faced difficulty in obtaining fuel for cooking. Previously they had their own source or they could collect dung or sticks free of cost from the fields surrounding their homes in their villages. Now they had to buy fuel, which meant a dent in their small budget. A small basket of cow dung cakes - the whole of which was used for cooking a day's meal - cost about five taka. In the study area, some of the respondents went a long way off to chars to collect 'chan', a type of grass, which they used as fuel.

Access to institutional credit: As their income was inadequate, most of the households had to incur debt. But access to institutional credit was

difficult. The only institutional source was the NGOs. Only a few had access to these. None had access to banks.

Problems faced in buying or selling products: Some of the households sold products such as eggs, milk, fruits and vegetables. But they had difficulty in carrying these to the market. Whether it was for buying or selling, going to the market itself was a problem for them. This was because the market was far and transport was not readily available in all of these places.

5.5. Coping with crisis

Vulnerability to different types of crisis events is but a part of poverty experience. Poverty also means limited capacity to cope with such events.

a. Financial coping: As the female heads did not have a regular source of income, their income was inadequate to meet their daily needs of life. About 93 percent of the respondents said their income was not sufficient. When asked how they managed their household expenses when they did not have any job, various answers were received.

Majority of the households had to take loans in cash or kinds to tide them over financial crisis. The main source of loan was non-institutional. Neighbors provided loan in most of the cases. Some took loans from relatives. Some others took loan from Mahajan's (money lenders) or bought goods from storekeepers on credit.

Most of the households reported to have taken loan from NGOs. It is obvious that institutional credit is definitely hard to obtain. A few households reported that they had to depend on the income of their sons during the period they could not find any work. Two households reported

selling homestead products to meet their daily needs and two others said they used up their savings.

b.coping with natural disaster and illness: Flood and river bank erosion were recurrent events in the lives of these embankment dwellers. The level of floodwater determined what strategy the head of the household should follow to cope with the crisis. When water entered the hut and was up to a foot deep, the family usually built a bamboo platform (mancha) on which they cooked, ate and slept. If the floodwater rose any further, they had to abandon their homes and took shelter on higher grounds of the embankment. As prices of goods soared, they had to buy things on credit and tried to cut down on their food intake. They waited for government relief to arrive. There was scarcity of fuel and medicine and potable water. Food, portable water and shelter were the immediate needs of these people during the floods. In the event of illness, the households did not approach anybody for help. Some, however, tried to obtain help from neighbors. Only a few percent sought help from physicians when they fell ill.

d. Coping with insecurity: In the case of any type of events giving rise to insecurity of life and property, majority of the households (58 percent) tried to cope with the situation themselves. In case they needed help, about 24 percent said they approached neighbors and another 13 percent asked help from relatives. The union council chairman or the police were hardly ever approached.

Table Strategies Followed in Coping Crisis

Type of Crisis Coping	Strategy followed by Majority	Next Best strategy	Least Followed Strategy
1. Financial coping	Take Loans from Neighbors	Loan from relatives or Others	Loan from NGOs
2. Coping with natural disaster	Stay home on manchas incur	Take shelter on top of embankment; wait for	Move elsewhere
Such as flood	Debt. Cut down govt. relief on food intake		
3. Coping with illness	Try coping with events themselves	Ask help from neighbors/relatives	Seek help of physicians
4. Coping with insecurity to life and property	Try situations themselves	Approach neighbors relatives	approach union council chairman/police

Source: Disaster in Bangladesh, K. Nizamuddin: 2001.

5.6. Key Gender issues in disaster:

Nevertheless, women are not only victims but also agents of change. Furthermore, women and men, working together, can identify those hazards that threaten their homes and livelihoods and work together to build safer communities.

- Women and men are vulnerable to disaster in different ways due to social and economic reasons.
- Due to pre-existing gendered relations, within the same social group/class women are poorer and more vulnerable in comparison to men of the same category.
- Impacts of disasters are different on men and women in terms of survival, death, injury, trauma and recovery.
- Needs and priorities of women and men in different stages of the disaster cycle are different (Biological, family, social and cultural).
- Gender based prejudices view women as weak, passive, incapacitated victims in need of rescue in crisis situations, although in reality women of different age groups play an active role.
- Gender based identities view men as strong and capable who require least assistance.
- Due to gendered identities, women's vulnerabilities get highlighter, capacities and skills get masked.
- Due to gendered identities, vulnerabilities of men are not visible and not recognized.
- Women and men have different skills and capacities resulting form gender based roles and responsibilities and gender based division of labor.

5.7. Natural disaster and Development

Disaster and development have almost always been delta with separately, No possible linkage between the two were understood or foreseen till recent times, responding to emergencies is no doubt an important aspect of disaster management planning. The global scenario in relation to disasters is dismal. Natural and manmade hazards on life and livelihoods in increasing. Globalization is aggravating poverty and vulnerability we are grappling with increasing levels of poverty, a growing population, and limited and depleting natural resources problems of governance and rapid urbanization. These phenomena increase the numbers of disasters and their levels of impact.

Disaster risk is a part of the dynamic forces at play in the process of development. Disasters need to be seen in the contort of where they take place and within what complex and dynamic physical socio economic institutional and political forces thus no development plan is complete unless it addresses contributory factors to disaster risk. Ultimately the objective of development and disaster management needs to be the same that is reducing socio economic vulnerability.

5.8. Effects on food security and agriculture:

It goes almost without saying that disaster can have very serious edicts on the contemporary development of a nation. This is especially so in revenue producing areas and infrastructure. Typical examples include:

- Crops which have been developed over a number of years to produce an export capability may be destroyed or seriously damaged. Such destruction or damage can result in loss of development capital, destruction of production sources (e.g. the trees

themselves) loss of processing families and equipment loss of employee housing and so on.

- Loss of livestock, through an outbreak of animal disease or rural wildfire, can' devastate valuable national resources such as meat or wool trades.

- Land inundated by cyclonic storm surge or tsunami can bring about Stalinization, with severe consequences to both domestic and export food sources. Similarly, drought may cause severe restrictions on wheat-growing, with consequent damage to or loss of a valuable export market.

In the case of infrastructure, losses from disaster can be crippling for ongoing national programs. For instance:

- Damage to harbors and wharves can drastically limit maritime transport capability thus restricting export and import activity.

- Loss of aircraft and airport facilities may impose serious constraints similar to those which apply to the maritime aspects mentioned above.

- Loss of roads and bridges may curb important ongoing construction and other programs.

- Loss of building and facilities can seriously hamper the conduct of business and commerce, in both domestic and international terms. (Ref: Disaster and National Development ADB).

The overall effect of disaster on contemporary progress and development may therefore be one which halts a nation in its tracks. This could be compared with the effects of a personal heart attack, in that it takes some time before the patient can resume business as usual.

5.9. Effects on Lang Term Development

The contemporary effects mentioned above can obviously be crippling or ongoing programs. However, some of the long-term consequences may be equally bad, or even worse. As a simple example, damaged coconut palms may take 7-8 years to rehabilitate. By this time, a valuable export capability may have become outdated, or lost to other countries. Also, some of the wider economic, social and other effects may bear heavily on long-term development.

There is one major general fact against which long-term effects should be judged. It is that when disaster strikes, it deprives a nation of many of its current vital resources. These resources have to be renewed or rehabilitated before even moderate development can continue. Some of these resources are listed below and they come, by way of example, from a disaster which is ongoing at the time. (Disaster and national Development ADB).

- Communications
- Power Supplies
- Housing
- Roads
- Water supplies/Scarcity of Pure drinking water
- crops and other food sources
- Airport facilities
- Shipping
- Schools
- Medical and health facilities:
- General and maternity health
- Proper sanitation system
- Migration.

The national effort and cost required to make good this kind of loss in resources must obviously detract from what is available for long term development. So the first effect on long term programs which arises from disaster impact is the economic and material loss, which is likely to cause delays in the commencement and/or continuation of such programs.

5.10. Linkage between Disaster, Development and Poverty:

There is a significant relationship in the way that disaster and development affects one another. Disaster have special negative impacts on the non-formal sector where approximate costs of disaster are often underestimated mainly because small- scale disasters go unrecorded and receive no national priority. However these disasters adversely affect households and individual who fells the consequence most due to loss of income or bread winner members.

Disasters depress the non-formal economy through the direct costs of lost equipment infrastructure, housing, and lives and household intensely disaster also results in indirect costs such as loss of employ and economic losses.

The two possible contradiction referred to in the above section may be described as follows

Disaster can provide development opportunities:

Development program must be designed to decrease vulnerable to disaster and their negative consequences. For example housing projects that encourage the use of homemade bricks designed to withstand high winds or heavy rain fall result in less destruction during the next tropical storm.

Development can reduce vulnerability:

Disaster does high light high risk areas where action must be taken before another disaster strikes. The realization of vulnerability a after the occurrence of disaster can motivate policy makers and the public to participate in risk reduction activities.

Development can increase vulnerability:

Development can increase the vulnerability of communities; e.g by creating employment opportunities, you attract score of people who flock to urban areas to look for jobs and settle on dangerous location.

5.11. Micro-credit and disaster management:

Micro-credit program the study areas directed by various NGOS plays are crucial role in this victim areas because of most of the respondents are involved in different NGOs. Different NGOS has play a great role in disaster management. Besides government a number of NGOS participate in Disaster Management activities. To ensure coordination and to available duplication of reuse relief rehabilitation public awareness building activities a close relationship between Go representatives are therefore included in different disaster management committees at all level.

NGOS plays on important role in disaster management. NGOS appeared to be working separately in the affected areas. NGOS and the government could link up to work more effectively together during disasters and post disasters period different NGOS working to improve the socio-economic condition of the poor in disaster prone areas is obliged to take a proactive and effective role in the relief and post disaster rehabilitation activities. So that damage can be minimized and people are prevented from sluing in the poverty trap and bring life back to normal.

For instance comprehend save averment of risks from natural hazard's integrated water management practices post disaster rehabilitation of disaster affected people active participation of people from all walks of life including the envelopment agencies awareness and capacity building national disaster management plan specific programmed by NGOS and development partners. NGOS has different activities in disaster management such as social economical and institutional. Under all the activities economical activities that means to credit programs or loan programs is very eventual tool of disaster management.

5.12. What is disaster Management?

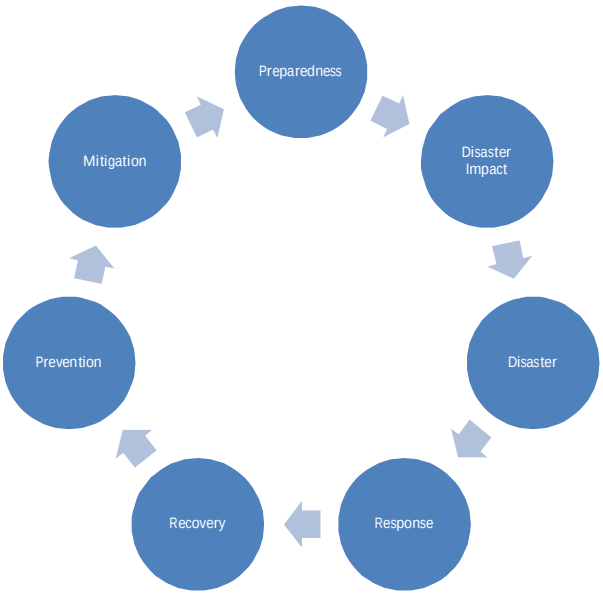
Disaster management is a special type of emergency management. It is an applied science which seeks by the systematic observation and analysis of disaster to improve measures relating to prevention, mitigation, and preparedness, emergency response, recovery and post disaster rehabilitation and reconstruction. This broad concept is relatively new in Bangladesh as "Disaster management has generally been under stood to mean only post disaster relief and rehabilitation.

The Government of Bangladesh and the major NGOS are detaching socio-economic, development programs have developed expertise for managing the consequences of natural disaster. They have a good track record of responding to disasters without the limits of their resources available in the shortest possibilities.

Disaster management is extremely important in all these stages of disaster predicator disaster and post disaster periods. For example if it is known that some areas in the coastal zones are prone to cyclone and tidal surge then it is important that propel resting in this cyclone prone areas should be trained to understand cyclone warnings and cyclone shelters should be

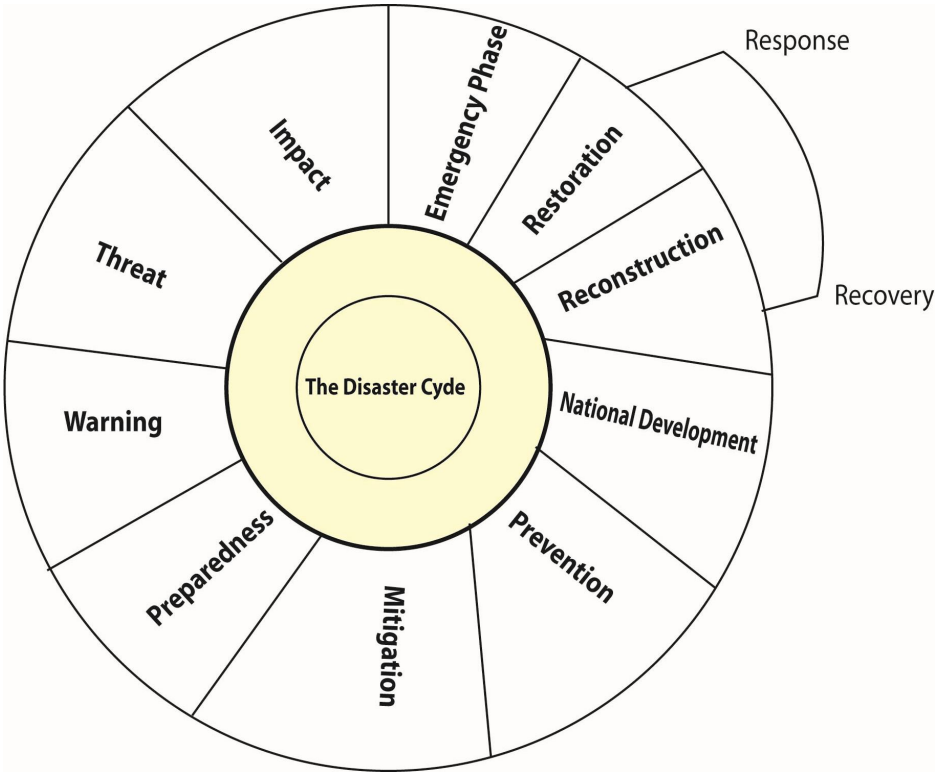
made to accommodate people at risk of cyclone and tidal surge. Post disaster relief and rehabilitation should be meticulously planned so that the affected people must be improve and back to normal life.

Basic Format of the Disaster Management Cycle



(Source: Disaster management Hand book ADB)

Alternative Format of the Disaster Management Cycle



(Source: Disaster management Hand book ADB)

- Disaster Management issues including disaster pre preparedness WARPO 2001), involves the flowing
- Incorporation of prevention and mitigation measures into an overall

  Development palming exercise.
- Preparedness pans and related warning and other measures including flood and cyclone forecasting and warning.
- Disaster response including emergency response to disasters when they occur.
- Post disaster reconstruction and rehabilitation.

Disaster Management cycle includes

Preparedness	Disaster Impact
Response	Recovery
Assessment	Prevention and
Mitigation	

Preparedness includes the formation of a viable counter disaster plan, maintenance of inventories of resources and the training of the personnel.

Response measures are usually those, which are taken immediately prior to and following disaster impact with a view to saving life and protecting property. Recovery means the process by which communities and the nation are assisted in returning to their proper levels of functioning following a disaster.

Preventive measures aim at impeding the occurrence of a disastrous event, or to minimize its harmful effects on communities. Mitigation includes the measures aimed at reducing the impact, of a disaster on a nation or a community.

Disaster Preparedness

Disaster preparedness is the most important phase of the whole process of Disaster Management. While speaking about preparedness, we are to inter-relate it with general preparedness measures such as planning and training and also focus more specifically to the development and maintenance of preparedness including its effectiveness prior to an occurrence of a disaster. Aspects to be covered in disaster preparedness are:

- The nature of preparedness; - Problem areas in preparedness;

- Preparedness needs; - Precautionary and warning signals;

Resources relevant to preparedness arrangements.

Disaster preparedness involves forecasting and taking precautionary measures prior to an imminent threat when advance warnings are possible. It also includes the formulation of viable disaster plan, maintenance of resources in the training of personnel.

Preparedness involves the development and regular testing of warning system connected with forecasting system and plans for evacuation or other measures to be taken during a disaster alert period to minimize. Loss of lives and damages to property. Disaster preparedness minimizes the effects of a hazard through effective readiness measures to expedite emergency action, rehabilitation and recovery. It ensures the timely, appropriate and effective delivery of relief and assistance following a disaster:

A distinction is made between 'active' and 'passive' disaster preparedness measure. 'Active' disaster preparedness would include developing comprehensive response plans, monitoring hazard threats, training emergency personnel, and training members of the communities at risk. Some problem areas regarding disaster preparedness include the following:
-Inadequate policy direction;

-Lack of vulnerability assessment;

-Lack of appropriate counter disaster plans;

-Inadequate or inappropriate organizational structure;

-Over- concentration on response and recovery measures;

-Lack of complete inventory of resources;

-Absence of clear allocation of roles and responsibilities of functionaries;

-Inadequate coordination;

-Friction or lack of cooperation between disasters related organizations;

-Absence of a national or central Disaster Management focal point

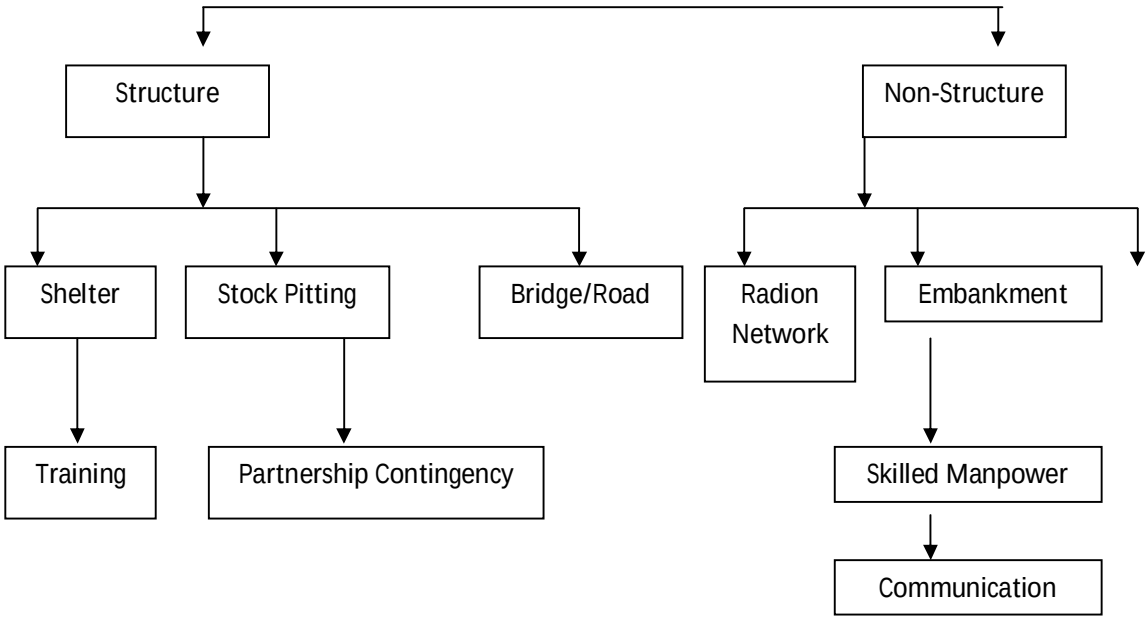
-Including well -equipped: Emergency Operation Centre;

-Lack of suitable training for Disaster Management personnel;

-Inadequate public awareness and information concerning disasters.

Diagram for disaster preparedness

Disaster Preparedness:



Source: Disaster Mitigation in Bangladesh Country case study 2004

Disaster Response

Disaster response is the sum total of actions taken by the people and the institutions in the face of a disaster. These actions start with the warning of an incoming threatening event or with the event itself if that occurs without warning.

(i) Disaster response includes the implementation of Disaster Preparedness Plans and Procedures. The last step in disaster response involves the completion of disaster rehabilitation program. The following are the activities in disaster response:

(a) Warning;

(b) Evacuation of people threatened by disaster;

(c) Search and rescue;

(d) Post disaster assessment;

(e) Emergency relief

(f) Logistics and supply

(g) Communication and information Management

(h) Survivor response and coping (Trauma Management)

(i) Security

(J) Rehabilitation and Reconstruction.

(ii) Disaster Assessment

Assessment is the process of determining the impact of a disaster on a society. The first priority is to save and sustain lives of survivors. The second is, expediting recovery and development. The objective of post-

disaster assessment is to determine when an emergency exists, define the actions and responses needed to reduce immediate threats to health and safety and to pre-empt future serious problems. The assessment must help decide how best to use the existing resources for relief and identify the priorities of the affected people.

The assessment process include, (a) identification of information need; (b) sources of reliable data; (c) collection of data; (d) analyzing; (e) interpreting data and reporting conclusions and (f) forecasting for the decision maker.

Disaster Mitigation

Mitigation is one of the positive links between disaster and assessment. Mitigation encompasses all actions taken prior to the occurrences of a disaster (pre-disaster measures). It includes long-term reduction and preparedness measures. Mitigation tries to lessen the impact of disaster by improving the community's ability to absorb the impact with minimum damage or disruptive effects. Mitigation is risk reduction. Mitigation applies to measures such as, construction of stronger building or agricultural diversification or developing techniques for hazard assessment in land use planning. The following are the menu of Disaster Mitigation Actions:

(a) Engineering: Engineering measures are those that result in stronger individual structures that are more resistant to hazard.

(b) Spatial Planning: It includes the identification of safe zones for resettlement in areas with adequate security and resources to support the displaced persons.

(c) Economic: A strong economy is the best protection against future disaster. Stronger buildings, safer sites, larger financial reserves can best cope with future losses.

(d) Management and Institutionalization: Organizational and procedural measures are necessary for disaster mitigation. Education, training, public awareness building and development of professional experts are the necessary components of institutionalizing disaster mitigation.

(e) Societal: There must be a consensus in the society for disaster mitigation. Mitigation should aim to develop a disaster "safety culture'1 one in which general public is fully aware of potential hazards, chooses to protect itself and can rapidly support protective efforts made on its behalf.

(f) Conflict reduction: Measures at conflict reduction must start with identifying and addressing the root causes of conflicts. The issues may arise over causes like Land tenure, employment, access to resources and intolerance of ethnic or religious groups. These issues needs to be anticipated through a form of early warning and defused before conflict erupts.

Mitigation could be classified as follow

(a) Active and Passive: For active measures, authorities promote desired actions by offering incentives. For passive measures, authorities prevent undesirable action by using control and penalties.

(b) Structural and non-structural: Structural mitigation involves physical measures taken to reduce risk by erecting structure such as, cross-dam, cyclone shelter construction etc. Non-structural measures are

policies and practices of development whose implementation reduces the risk, such as, Training and Public Awareness building etc.

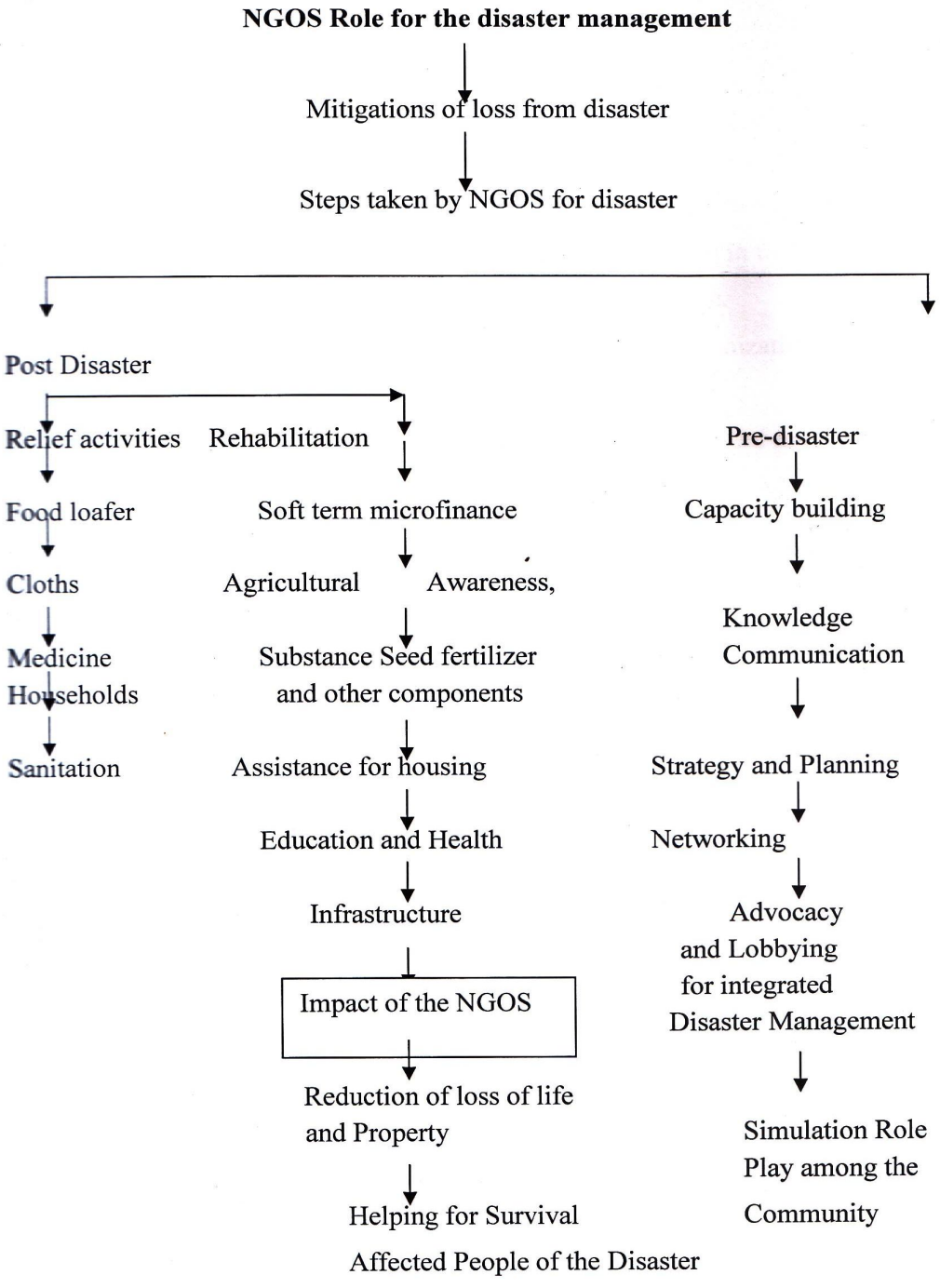
(c) Restrictive and incentive: Restrictive measures are those, which promote safety by making some actions or development unlawful or prohibitively expensive. Financial, legal or other advantages to promote activities are also beneficial in terms of mitigation.

(d) Sect oral based activities: For example, in agriculture sector response might be to introduce hazard resistance crops/trees or to diversify cropping patterns. Other sector may also plan accordingly. Risk reduction measures of mitigation are done in the pre-disaster time It can be done immediately after disaster.

Role of NGOs for Disaster management:

Frame work of NGO characteristics

(Source: Dale 2000: Chabers 1983: UNDP 1996)



(Source: Disaster Management hand book ADB)

5.13. Government and NGOs provide services to the affected people:

Government agencies, non-government organizations including local, national and international level play a vital role for the disaster affected people. Among non-government organization BRAC, caritas, Muslim Aid, world vision and other local NGO especially get involved in relief and rehabilitation and micro-credit activities. The donor agencies provide some structural mitigation measures like cyclone shelters, coastal embankment, improving housing conditions and non-structural mitigation measures like coastal forestation, awareness building, community preparedness, emergency response. GA and NGOs also implement micro-credit program for the dwellers. This credit helps the dwellers to cultivate their land and run their business. In addition both the agencies provide food and clothes, material for house building; pure drinking water and primary health care services establish shelter homes for the coastal dwellers.

NGOS activities in natural disaster:

- To ensure warning signal before disaster.
- To establish shelter home

- Disaster Preparedness response and mitigation.
- Training for volunteers and ensuring more involvement of field level
- Action plan for cyclone for preparedness and management provides information regarding cycle and giving courage staying beside the people.
- Increasing awareness among the people and install plant in the coastal area.
- Removing arsenic contamination and health care service.

- Collection and deliberation of information and organization seminar and workshop.
- Assist the disaster affected people and fair distribution relief materials.
- Fund collection and judicial distribution
- Risk and resource map preparation.
- Rehabilitation program for sustainable development of the affected people.

Organizational Arrangement in Bangladesh

Ministry of Disaster Management and Relief (MDMR) has the principal responsibility for Disaster Management under the Allocation of Business (Schedule-1 of the Rules of Business). The Ministry has taken the following responsibilities:

1. Formulation and implementation of policies relating to planning coordination monitoring and evaluation of all relief programs
2. Formulation of policies and preparation of national disaster preparedness plan and coordination of all aspects of disaster management;
3. Formulation of disaster management guidelines
4. Coordination of all disaster related activities by different agencies of Government during disaster and post disaster period
5. Helping related concerned Ministries and agencies to develop their own Action Plans on Disaster Management
6. Emergency rehabilitation of temporary nature through distribution of relief materials
7. Administration of relief work and sanction of funds for

(a) Distribution of gratuitous relief

(b) Distribution of grants and loans for house building and other relief Purpose and

(c) Execution of test relief work etc.

5.14. The role of community or community based disaster management

Disasters and Communities:

Disaster risk is on the rise throughout-the world. Over the past two to three decades, the economic losses and the number of people who have been affected by natural disasters have increased more rapidly than both economic and population growth. The physical, social and economic losses caused by these disasters are particularly harsh for developing countries since they have a long-range effect in the development process. The impacts of the disasters are deeply related with the socio economic conditions, tradition, culture, and climate of the communities.

To minimize the damages caused by disasters, various efforts have been taken by the Government, international community's including donor agencies. However, in spite of participation of these sectors during the project period, it has been observed that many of the disaster management programs have failed to be sustainable at local level after the completion of the project. Without sustainability, disaster management efforts will not preserve. A critical element of sustainable disaster management is communities' participation in these activities. The most common elements of community involvement are partnership, participation, empowerment and ownership by the local people. The emphasis of disaster management efforts should focus on communities and the people who live in them. Unless the disaster management efforts are sustainable at individual and community level, it is difficult to reduce the losses and scale of the tragedy. There needs to be an opportunity where people can be involved from the initial programming stage of disaster management activities. Through these community-based activities, people should be able to

participate alongside government officials and experts group as the direct stakeholders of these activities. While people should own the problems, consequences and challenges of any mitigation and/or preparedness initiative, it is necessary to take people's involvement further, into policy and strategy. This process induces sense of ownership to the people which results in their continuous engagement and long term commitment to these activities. Involvement of communities is important in both pre-disaster mitigation and post disaster response and recovery process.

Community Empowerment

While disasters can strike wide region or a nation, that impact is felt at the community level although it may hit one or several communities at once. It is these communities that constitute what is referred to as "disaster fronts". Being at the forefronts, communities need to have capacity to respond to threats themselves. It is for this reason that communities should be involved in managing the risks that may threaten their well-being. While different community empowerment programs related to disaster mitigation have achieved their objectives, they are often short term, and issues on sustainability in these efforts are rarely addressed. Government, non-government and international organizations implement various programs before and after the disasters. Most of them are very successful during the project period, but gradually diminish as the years pass. There are many reasons for this kind of phenomena; however, lack of effective participation and capacity building of the local communities to peruse the program remains major factor for lack of sustainability. It is accepted that governments have the prime responsibility for managing disasters and for taking into consideration the roles played by different players. In the past, top-down and

Command-and-control approaches were oftentimes used to manage the consequences of disasters. In this approach, decisions come from higher authorities based on their perception on the needs. The communities serve as mere "victims" or receiver of aid. In practice though, this approach was proven to be ineffective. It fails to meet the appropriate and vital humanitarian needs. Moreover, it increases requirements for unnecessary external resources and creates general dissatisfaction over performance despite exceptional management measures employed. This is due to the fact that the community, as the primary stakeholder and recipient of the direct impact of disasters, was not given the chance to participate in the process of decision-making and implementation of activities. On the other hand, communities if left alone have limited resources to fully cope with disasters. In many developing and underdeveloped countries, those who suffer the most are the poor, who, in the first place have limited survival resources and do not enjoy adequate infrastructure and access to social services. Community empowerment for disaster risk management demands their participation in risk assessment, mitigation planning, capacity building, participation in implementation and development of system for monitoring which ensures their stake.

5.15 Community Based Disaster Management (CBDM)

Most of disaster response can be characterized as command and control structure one that is top down and with logistic center approach. Because of this, we observe, lack of community participation that results into failures in meeting the appropriate and vital humanitarian needs, unnecessary increase in requirement for external resources, and general dissatisfaction over performance despite the use of exceptional management measures. Recognizing these limitations, the Community Based Disaster Management (CBDM) approach promotes a bottom-up

approach working in harmony with the top - down approach, to address the challenges and difficulties. To be effective, local communities must be supported into analyzing their hazardous conditions, their vulnerabilities and capacities as they see themselves. In case of disasters, the people at the community level have more to lose because they are the ones directly hit by disasters, whether major or minor. They are the first ones to become vulnerable to the effects of such hazardous events. On the other hand, they have the most to gain if they can reduce the impact of disasters on their community. This concept gave rise to the idea of community-based disaster management where communities are put at the forefront. Through the CBDM, the people's capacity to respond to emergencies is increased by providing them with more access and control over resources and basic social services. Using a community-based approach to managing disasters certainly has its advantages. Through CBDM, it is hoped that communities will be strengthened to enable them undertake any programs of development including disaster preparedness and mitigation. The CBDM approach provides opportunities for the local community to evaluate their own situation based on their own experiences initially. Under this approach, the local community not only becomes part of creating plans and decisions, but also becomes a major player in its implementation. Although the community is given greater roles in the decision-making and implementation processes, CBDM does not ignore the importance of scientific and objective risk assessment and planning. The CBDM approach acknowledges that as many stakeholders as needed should be involved in the process, with the end goal of achieving capacities and transferring of resources to the community, which level who would assume the biggest responsibility in over disaster reduction different stakeholders, from local government decision makers to schoolchildren. In all initiatives, attempts were made to ensure that communities are engaged in

disaster risk management phases' and are empowered to carryover them in long term run.

5.16 Sustainability in Community Based Disaster Management

In the Year 2002, UNCRD launched a three-year project on titled "Sustainability in Community Based Disaster Management", to study the effectiveness of the grass- root projects and to suggest policy input for Sustainability, which will be useful for the different communities to take future actions. This was to help to understand the gaps in the community initiatives, and to take corrective actions in future. The study would be an evaluation of what has been done so far in CBDM with specific examples from field experiences, and what should be done in future for the Sustainability of these efforts. In this study, the inter-linkages of government, non-government, academics, and international organizations should be reflected in terms of concrete projects and initiatives, and a model of cooperation would be established. The goal of the current study is to achieve safety and Sustainability of livelihoods for effective disaster mitigation, focusing on three key elements: self-help, cooperation, and education. In order to identify the key factors for successful CBDM, six case studies were chosen in the Asian region targeting three specific hazards: Cyclones (India and the

Philippines), earthquakes (Indonesia and Nepal) and Floods (Bangladesh and Cambodia). At first, field surveys were carried out and best practices from the case study countries were documented. Based on the analysis of these cases studies, overall framework of action for the sustainability of community based disaster management was prepared. Generic and specific guidelines were developed and field experimentations and testing were made for specific hazards in selected case study countries. From the three years study, followings were found as key factors for enhancing sustainability:

- The existence of "culture of coping with crisis" and “culture of disaster reduction “exist
- Risk assessment process involves participation of people and incorporating their perception of vulnerability and capacity
- Community and supporting agencies share common motivation and ownership for the initiation and sustainability of CBDM
- Genuine people's participation within capacity building objectives, with specific focus on sect oral groups like women, elderly, children and ethnic minorities
- Well-delivered training inputs in accordance with the objectives of the project and the needs of the community for training
- Wider stakeholder’s involvement and participation
- Accumulation of physical, technological and economic assets to reduce hazards and vulnerability
- Integration of these projects into regular development planning and budgeting to ensure sustainability

The United Nations Centre for Regional Development (UNCRD) is, currently, promoting School Earthquake Safety Initiative through a project "Reducing Vulnerability of School Children to Earthquakes" jointly with UN Department of Economic and Social Affairs (UNDESA) in Asia-Pacific region. The project aims to make schools safe against earthquakes and build disaster- resilient communities through self-help, cooperation and education. The project includes retrofitting of school building in a participatory way with the involvement of local communities, local governments and resource institutions, trainings on safer construction practices to technicians, disaster education in school and communities. These activities are carried out in Fiji Islands, India, Indonesia and Uzbekistan as demonstration cases which will be disseminated throughout the respective geographical regions. There are three major aspects of the community empowerment in earthquake disaster risk management through this initiative: Seismic safety of school buildings: The projects include seismic vulnerability analysis of some selected schools in a project city of each country and retrofitting of some of them which cover prominent construction typology in the region. This leads to' development of country specific guidelines on the earthquake safe construction which incorporates solutions to the practical problems experienced school retrofitting. Capacity building of communities: Retrofitting of schools in communities serves as a demonstration of proper earthquake technology to them. Masons in the communities get on-job training during the retrofitting of schools. In addition, technicians in each project cities get trainings on earthquake design and construction of houses. Consideration is given to the local practice, material availability, indigenous knowledge and affordability in-trainings on earthquake technology.

Disaster education and awareness

The project includes development and wide distribution of educational booklets, posters and guidebook on teachers training and students' drills for earthquake disaster preparedness and response. The guidebooks get verification and updated through trainings and mock drills. The projects also develops an interactive educational tool for awareness raising on earthquake disaster and simple seismic risk assessment of buildings aiming to motivate households for planning seismic upgrading of their houses. It was learned from earlier programs of UNCRD that the process of making safer schools can be used as an entry points to the communities at risk to facilitate implementation of a training and capacity -building program for earthquake disaster mitigation technology besides its prime objective of ensuring the safety of school children against future earthquakes. It is achieved by demonstrating how schools can be used as community center for earthquake disaster prevention and mitigation. Locally applicable and affordable earthquake-safer construction technology is transferred to these communities.

5.17. Lessons:

In regards to the issue of engaging and empowering communities for sustainable disaster risk management, followings are the major lessons’

> Community empowerment and communication help to achieve sustainability in CBDM

> A holistic secure-livelihood approach enhances sustainability

> Community based action plans and training improves community’s problem solving skills.

- Because disasters are unpredictable, it is important to maintain the projects and people’s awareness of disasters.
- Transparency of activities and dissemination of knowledge and information encourage people's participation in activities
- CBDM efforts need stable financial resources.
- 'What is accepted by the community' is more important than 'what is necessary'
- Institutionalizing the community and the private sectors can result in more sustainable disaster management programs

Chapter-6
Findings of the Study

6. Vulnerable Situation and Risk of People during Disasters:

With increasing global warming and climate change, salinity of drinking water resource is becoming a major problem for the people south west past of Bangladesh. During the dry season when lack of potable water becomes an acute crisis for households, it becomes the responsibility of women to provide drinking water for their families. Since water sources are affected by high salinity. People need to travel long distances, sometimes up to 2-3 kilometers on foot every day over rough route in search of water. It is quite well known that pregnant women. Children, elderly and disable person are more vulnerable than the other section. It has been noticed that during disaster. They are left behind to leave in cases of emergency because they are weak, lack of knowledge, mobility and resources.

Gender discrimination is at levels of the disaster process: Risk preparedness response, physical and psycho social impact and recovery, People are more likely to suffer from malnutrition. Moreover their ability to cope with injuries, infections and disease are reduced. Institutional health care and sanitation facilities are very poor on coastal areas. The primary health care of families is mostly dependent on the traditional knowledge and local quack doctors. Many women refrain from going to shelters during a disaster or when a warning signal is issued due to loss of privacy and physical and mental abuse torture and security. Due to SIDR and AILA and other disaster situation, People have cost their entire living and working situation, and finally their capital and antes equipment.

In this situation, women are most vulnerable Group to reproductive and sexual health problems. The study shoos the advice reproductive outcomes such as early pregnancy cuss, premature delivery and delivery related complications. In most cases, they have to walklong distances and

standing time for collecting relief with their well cloths clinging to their bodies. Post disaster rehabilitation is often overlooked due to gender discrimination.

Disaster damages livestock (i.c. cows, goats buffaloes), Poultry, fisheries, trees, crops, seeds and animal fodder, Again, due to damages infrastructure and communication systems, People connote access the market to sell food item or other products. Peoples are forced to trade with lower prices offered by buyers within the village. As a result, there is a net loss in income which makes it even harder for households to cope with disasters.

6.1. Coping Strategies and Mitigation:

Peoples in coastal area try to copy with disasters with their traditional knowledge and arts. This traditional strategy becomes a little helpful due to change of the nature of disaster. At the time of flood or cyclone season peoples try to make their houses more resilient to disaster with locally available resources likely strong pole, straw, increasing the height of foundation of the households and the levels of cow sheds. In flood prone arena, People prepare elevated platform for family members with disabilities using the choke (traditional bed) with bamboo and wood.

In study areas, people control homestead based livelihoods, livestock, fisheries tress seeds and animal fodder, despite the limited resources in affected areas people play a significant role in food preservation to combat the adverse situation. Women preserve dry food, fuels, candle, matches ropes and medicine at home and prepare potable mud stoves for future use. They offer collect firewood to store in dry places and store fodder for domestic animals. In post disaster period, peoples are also engaged in homestead gardening. They use rooftops and backward spaces to grow various vegetable and fruits.

In study areas, rearing and sale of livestock, fisheries and poultry are important economic activities almost entirely conducted by people. Women's scientific knowledge innovations and adaptation are demonstrated in their care of livestock, land mortgaging selling or borrowing from neighbors are the common strategies for survival. In many cases peoples are compelled to migrate to other places as an adaptation strategy. Female migrants mostly engage in the informal urban labor market. In coastal areas women are now port of microfinance organizations, using their membership to access loan. Micro-credit plays an important role to reduce disaster affected peoples vulnerability. Most of the women are involved in credit programs. They have taken loan with interest or lower interest from different NGOs.

6.2. Socio-economic characteristic of the respondents:

Age of the respondents:

Age structure of a country determines its demographic characteristics. The economy of a country depends on age structure. Below 16 to 64 tare considered as the dependent population who had no contribution in their household economic support

Table 6.3: Shows the age structure of the study area.

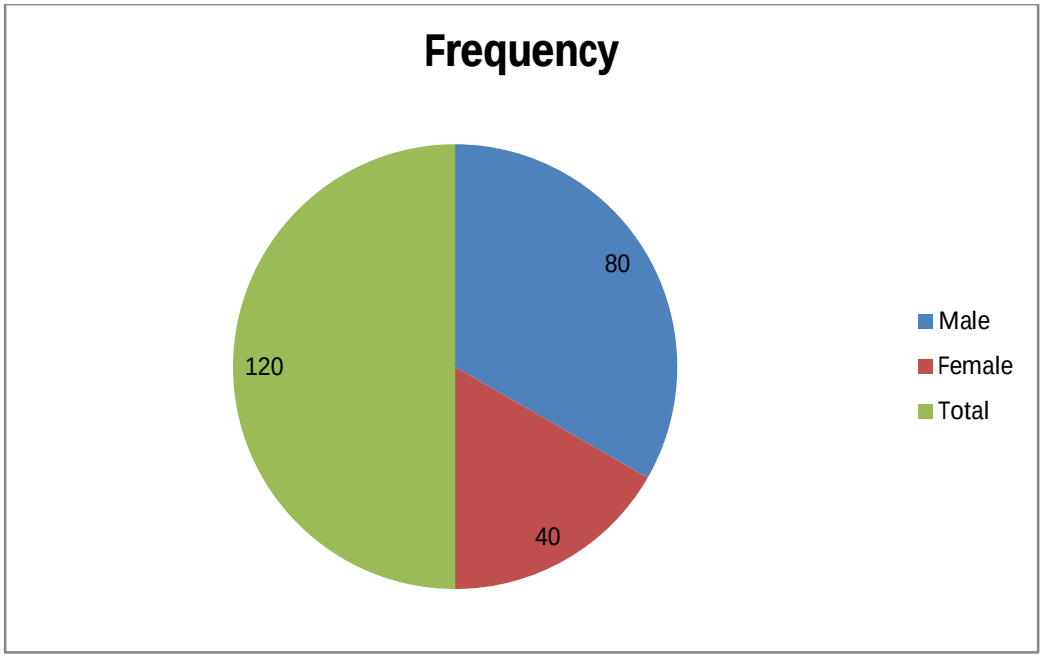
Respondent's Age distribution

Age distribution Years	Frequency	Percentage
20-24	10	8.33%
25-29	30	25%
30-34	40	33.33
35-39	25	20.83
40-44	15	12.5
Total	120	

Table 5.1: Shows that most of the respondent age group 30-34. It shows that of the 120 respondent only 8.33% belong to 20-24 years age group another slight 33.33% respondent's belong to 30-34 years age group 25% respondents belongs to 25-29 years age group.

Table-6.4. Respondent Sex Distribution

	Frequency	Percentage
Male	80	66.67
Female	40	33.33
Total	120	100



The above table shows that 66.67% respondents are male and 33.33% respondents are female.

Table-6.5: Respondents Religion

Most of the respondents are Muslim

Religion	Frequency	Percentage
Religion		
Muslim	85	70.83
Hindu	2.5	20.83
Others	10	8.33
	120	100

Table -3: Shows that most of the respondents are Muslim 70.83% respondents are Muslim 20.83% respondents belongs to others religion.

Table-6.6: Marital Status

Marital Status	Frequency	Percentage
Married	60	50
Unmarried	40	33.33
Widower	8	6.67
Divorce	12	10

Most of the respondents in this study are married person 33.33% respondent are unmarried 6.67% respondents are widower and only 10% respondents are divorce.

Table: 6.7: Respondents family type

Type of Family	Frequency	Percentage
Nuclear	50	41.67
Joint Family	40	33.3
Extended	30	25

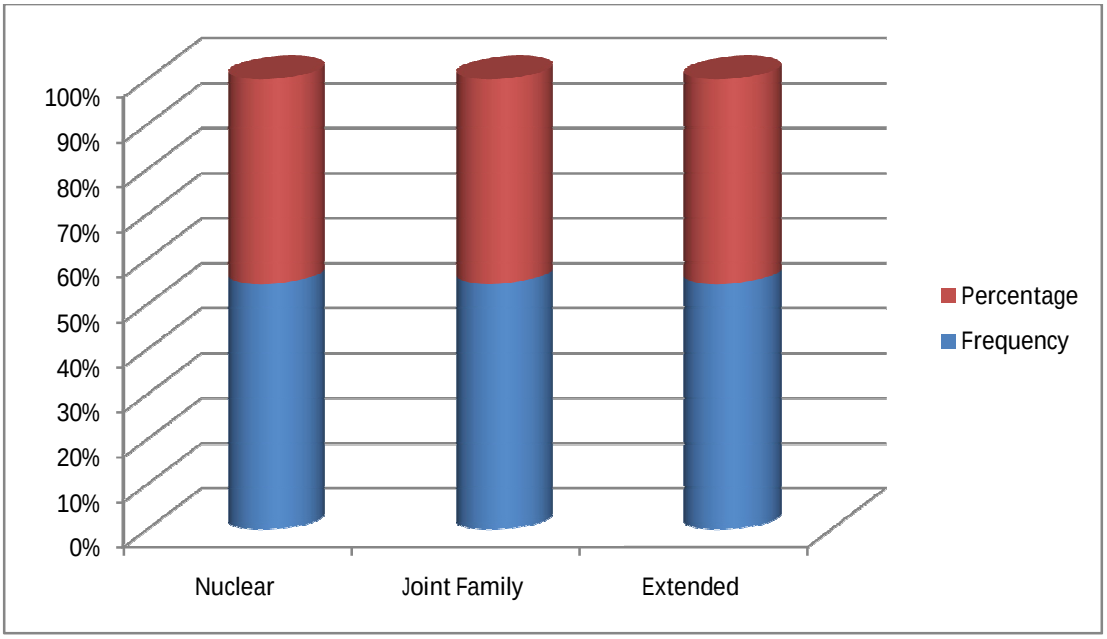
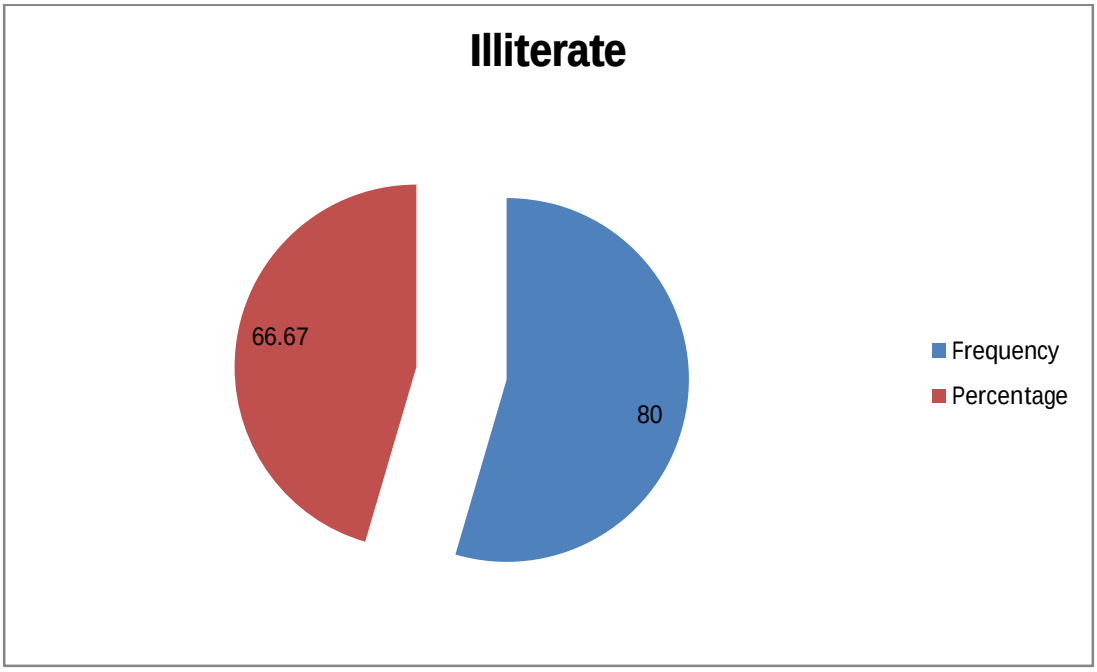


Table 5.3 Shows that 41.67% of respondents belongs to nuclear family, 33.3% of the respondents belong to joint family and only 25 of the respondents belong to extended family. These figure clearly revealed the changes pattern of family structure in rural Bangladesh.

Table-6.8: Educational back ground:

Male	Frequency	Percentage
Illiterate	80	66.67
Literate	40	33.33



The educational statuses of the respondents in study are is very poor most of them are illiterate (66.67%) only 33.33% respondents are literate.

Table -6.9: Occupation of the respondents

Our country is based on Agriculture. Most of people live by agriculture and more than 30 percent of our GNP comes from agriculture. Women contributed a very little amount to our country. In rural women's occupational facilities were not available. Beside there household activities a very few member engaged in service or other work facilities.

Agriculture	40	33.33
Day labor	35	29.17
Fishing	30	25
Rickshaw Puller	10	8.33
Shopkeeper	5	4.17

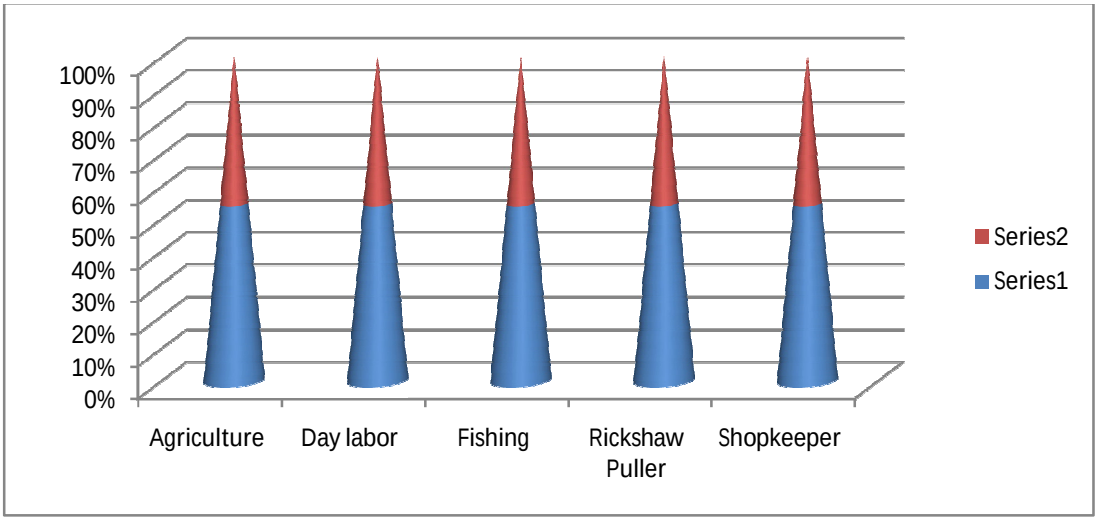


Table 7: Shows that 33.33% of the respondents involved in agriculture. 29.17% of the respondents were day labor. 25% of the respondents were involved in fishing activities. 8.33% of the respondents were rickshaw puller. 4.17% of the respondents were shopkeepers.

Table: 6.10: Monthly Income of the respondent's house holds

Income	Frequency	Percentage
Below 2000	10	8.33
2001-3000	40	33.33
3001-4500	45	37.5
4500-6000	25	20.83

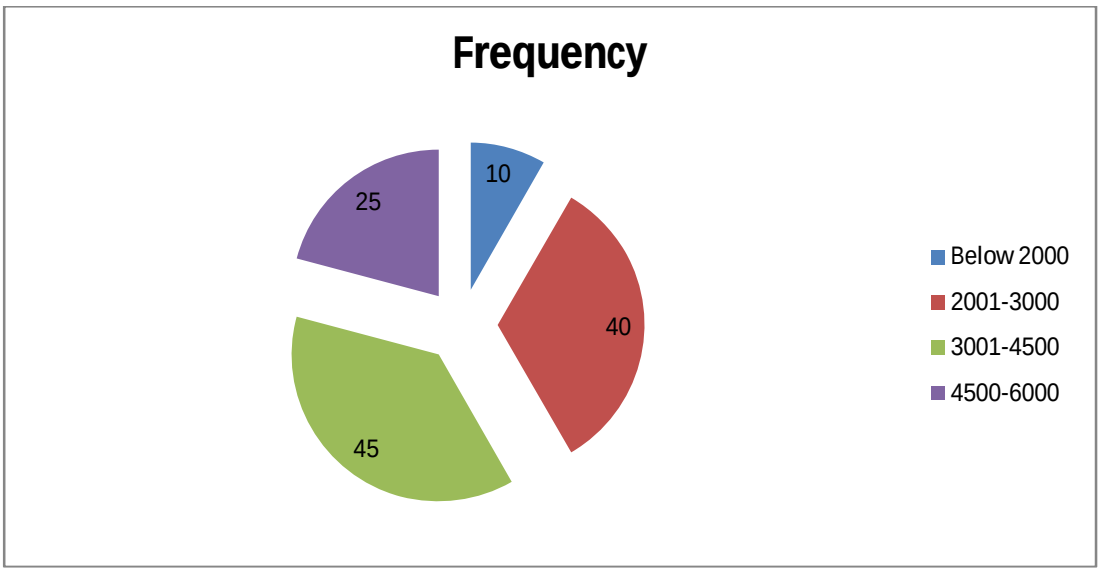
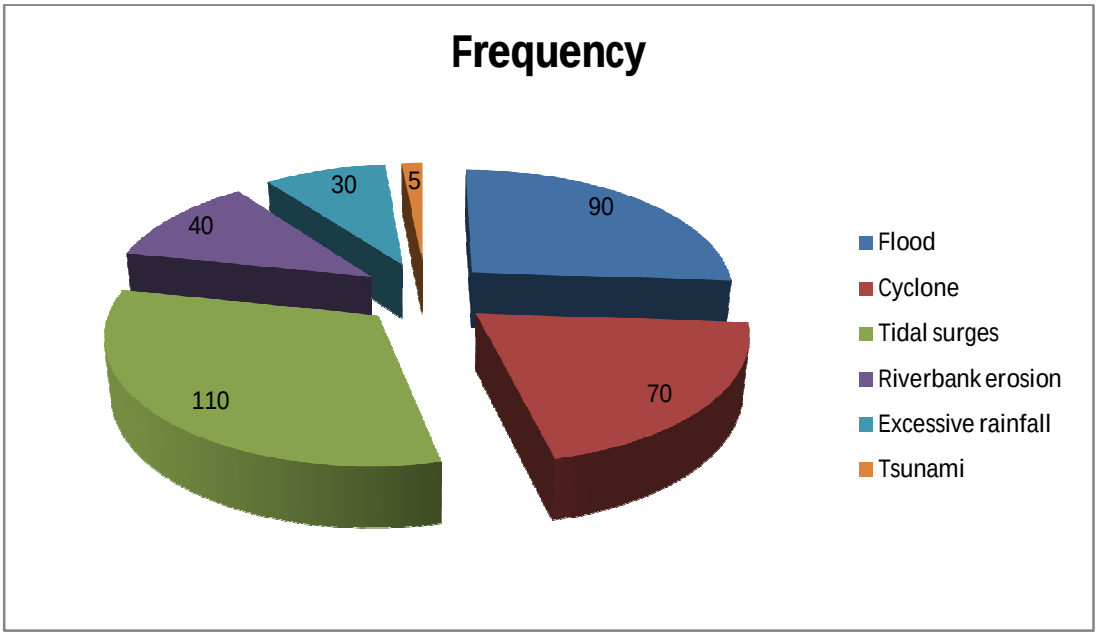


Table 6.10: Shows that 8.33% of the respondents house hold earns taka below (2000). The two income category that sets off for the largest number of cases are in taka below 2001-3000 (33.33%) and taka (3001-4500) category, (37.5%) and only 20.83% of the respondent's households earn taka (4500-6000).

Table: 6.11. Information about disaster faced by the respondents

Types of Disaster	Frequency	Percentage
Flood	90	75
Cyclone	70	58.33
Tidal surges	110	91.67
Riverbank erosion	40	33.33
Excessive rainfall	30	2.5
Tsunami	5	4.17

Source Field work [More than one answer is possible)



The above table indicates that most of the respondents have faced tidal surges flood and cyclone (91.67%) 75% and 58.33%) respectively. River erosion, tsunami and excessively rainfall are the other disasters faced by the respondents; Natural disaster is the constant company of coastal population. They are faced more than one disaster every year.

Table 6.12: Information about getting warning signal of disaster.

Getting Signal	Frequency	Percentage
Yes	20	16.67
No	100	83.33
Total	120	100

Source: Field work

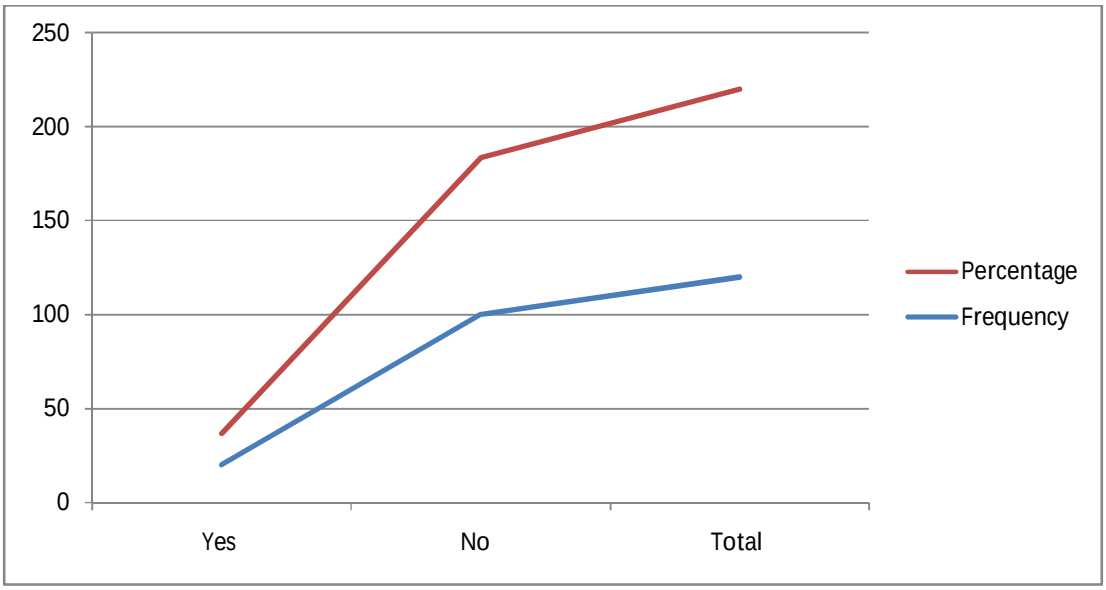


Table: 6.12: shows that 100 respondents (83.33%) do not get any signal of disaster. Only 16.67 percent respondents get signal of disaster. It means that most of the respondents do not get marriage signal of disaster.

Table-6.13 Means of getting information of.

Most of the inhabitants of coastal areas depend on the indigenous technology for getting the signal of disaster. Due to lack of modern weather fore casting technology likely radio, TV and so on peoples of the study are do not get warning signal of disasters.

Means of getting information	Frequency	Percentage
Radio	30	25%
TV	20	16.67
Miking	70	58.33
Volunteer	15	12.5
Neighbors	40	33.33
Relative	30	25
Others	18	15%

More than one answer was Possible.

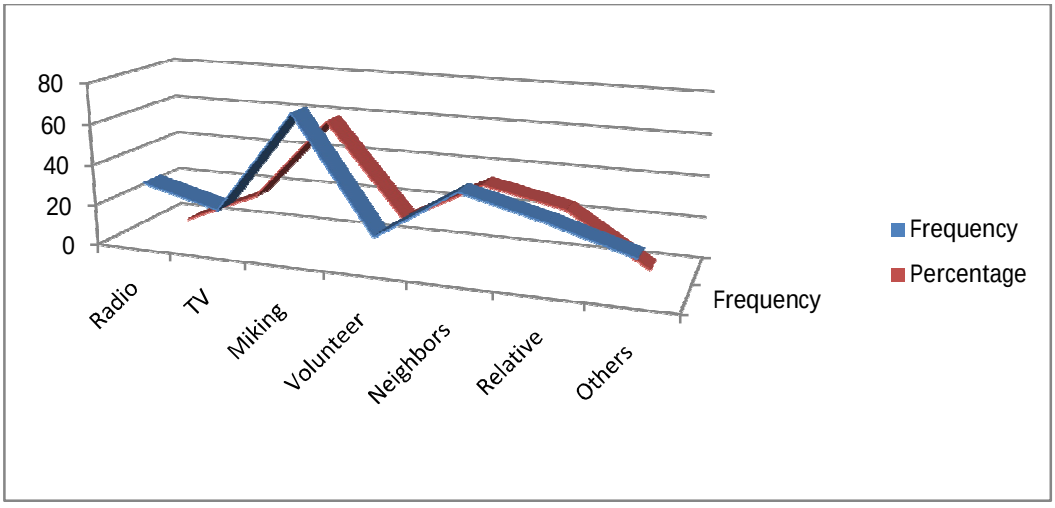
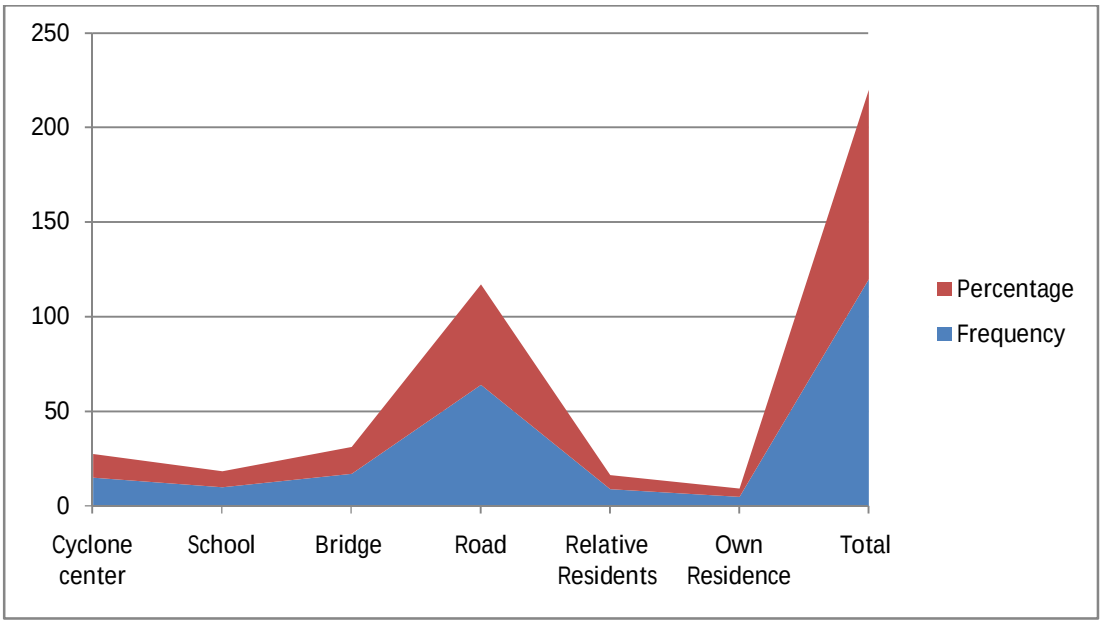


Table shows that 58.33% respondents getting information from miking. 33.33% respondents getting information from neighbors, 25% getting information from relatives. 25%, 16.67% getting information through radio and TV respectively.

Table: 6.14: Information about shelter place of the respondents

Shelter Place	Frequency	Percentage
Cyclone center	15	12.5
School	10	8.33
Bridge	17	14.17
Road	64	53.33
Relative Residents	9	7.5
Own Residence	5	4.17
Total	120	100

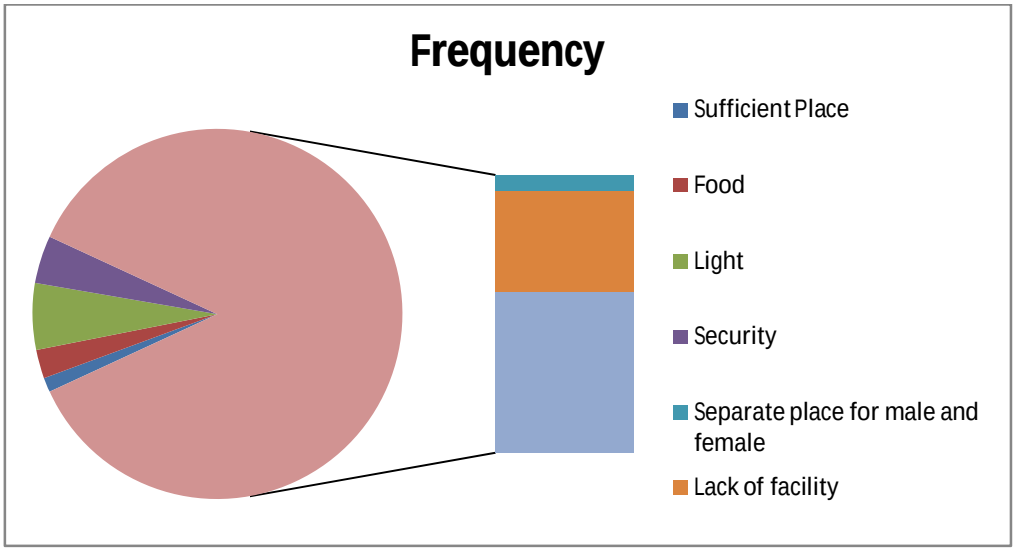


This table shows that most of the respondents (53.33%) take shelter on the roads 12.5% takes shelter in the cyclone center and 14.17% take shelter on the bridge 7.5% take shelter in relative residence and 8.33 take shelter in schools. Only 4.17% respondents stay in their own residence during the disaster.

Table: 6.15: Information about the facilities getting by the respondents in the shelter center.

Facilities	Frequency	Percentage
Sufficient Place	3	2.5%
Food	6	3%
Light	14	11.67
Security	10	8.33
Separate place for male and female	12	10
Lack of facility	75	62.5
Total	120	100

Source Field work:

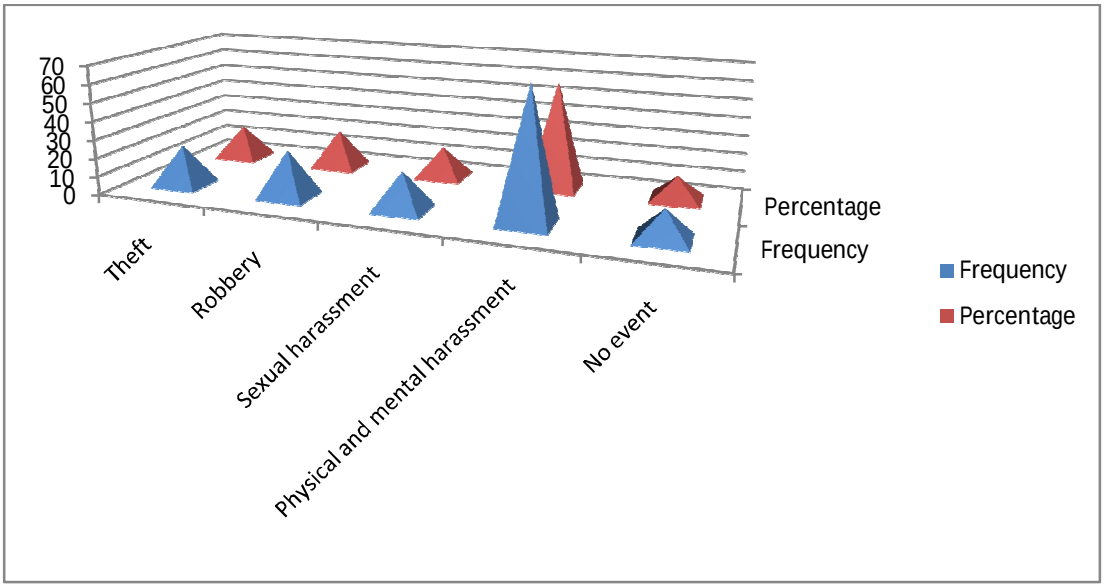


The Study Shows that most of the respondents (62.5%) face lack of facilities in the shelter center. 10% respondents opine that there are separate places for male and female at the shelter carters. 2.5 respondents report that they do not get sufficient place 5% respondents says that the do not get sufficient food.

Table 6.16: Information about facing unexpected events during disaster.

Unexpected Events	Frequency	Percentage
Theft	22	18.33
Robbery	25	20.83
Sexual harassment	20	16.67
Physical and mental harassment	70	58.33
No event	15	12.5

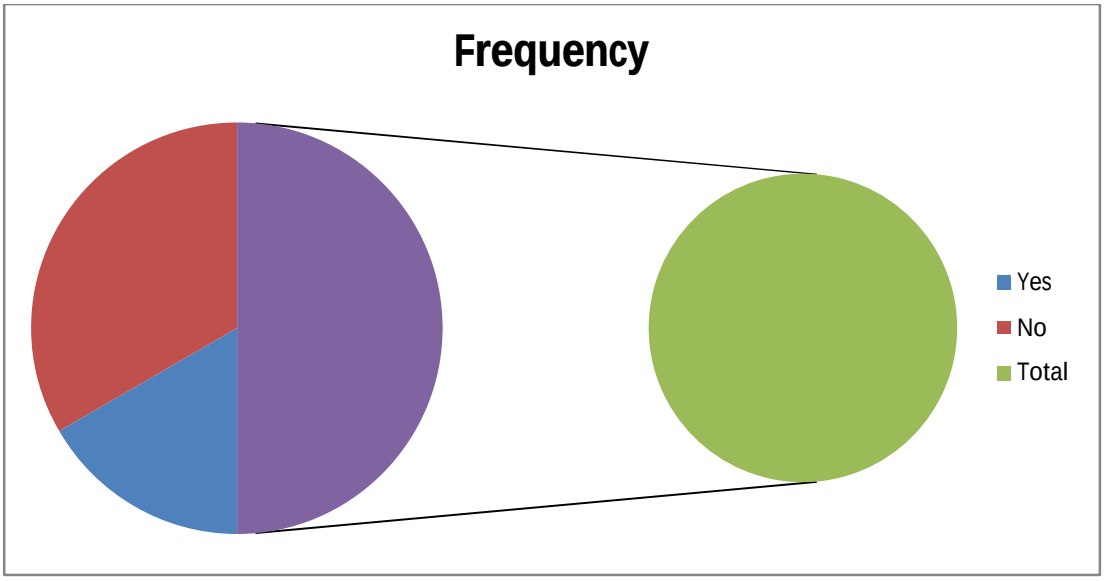
Source: Field work More than one answer was possible.



From the above table: it is observed that most of the female respondents face various kinds of unexpected events at the time of disaster. 58.33% respondents face physical and mental harassment. They face also theft (18.33%) and robbery 20.83% respectively. Only 15% do not face any unexpected situation at the time of disaster. Disaster has its devastating impact on all areas of life – physical, psychological, social and emotional and all these reaction are interlinked.

Table 6.17: Information about the necessary food stored.

Food stored	Frequency	Percentage
Yes	40	33.33
No	80	66.67
Total	120	100

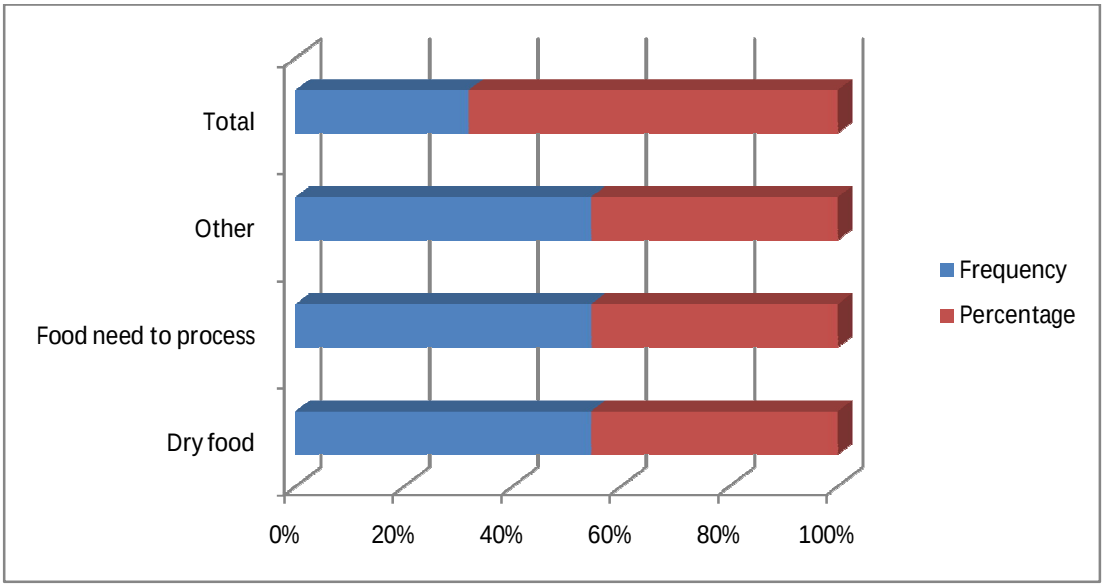


Source: Field work

This study shows that most of the respondent's families (66.67%) cannot store food for combating the disaster due to their poverty. Only 33.33% can store different kinds of food before disaster. In most cases, many of them fail to bring these at shelter places.

Table 6.18: Information about the necessary types of food.

Types of food	Frequency	Percentage
Dry food	17	14.17
Food need to process	25	20.83
Other	5	4.17
Total	47	100

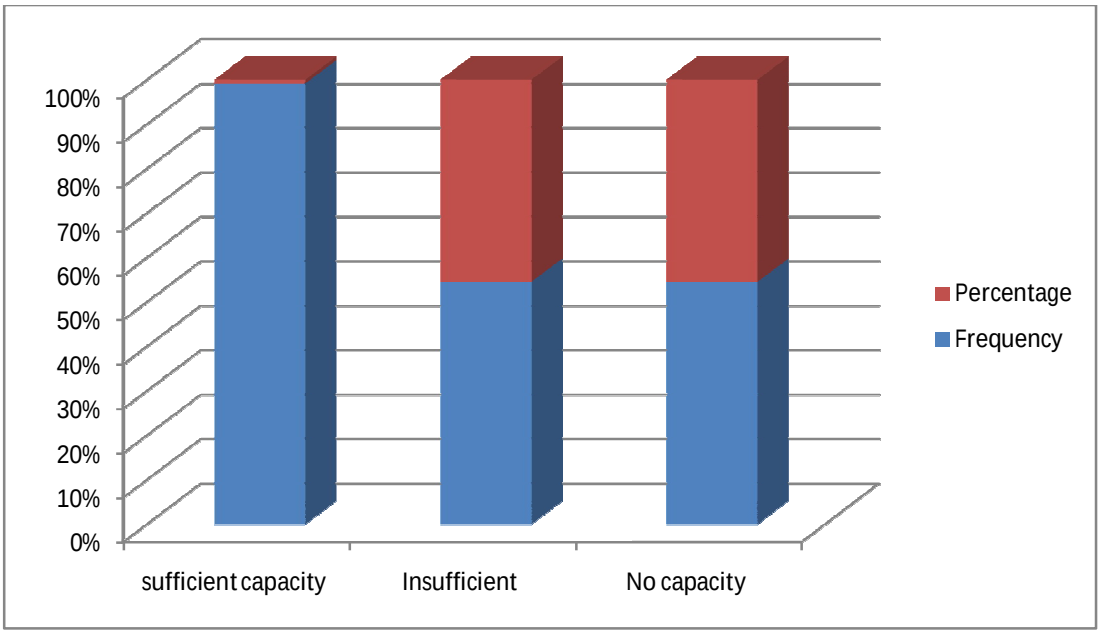


14.17% respondents can store dry food like chira, muri, gur and so on 20.83% responds notice that stored food needs to be cooked which is not possible owing to the lack of the fuel or cooking facilities.

Table 6.19: Information about capacity for buying food and medicine during disaster.

Capacity for buying food and medicine	Frequency	Percentage
sufficient capacity	15	12.5%
Insufficient	35	29.17
No capacity	70	58.33

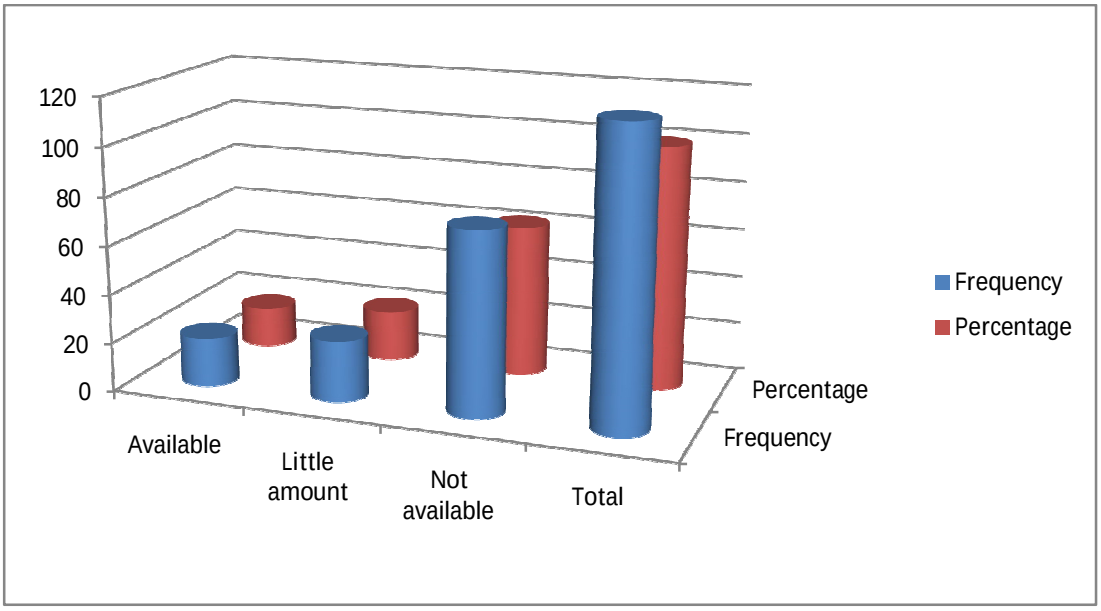
Source: Field work



This table shows that most of the respondents (58.33%) have no capacity for buying food and medicine. 29.17% respondents has insufficient capacity and only 12.5% respondent has the capacity to buy food and medicine during and after disaster . They become vulnerable due to loss their food assets livestock, agricultural production and loss of job.

Table 6.20: Information about the availability of drinking water during and after disaster.

Drinking water	Frequency	Percentage
Available	20	16.67
Little amount	25	20.83
Not available	75	62.5
Total	120	100

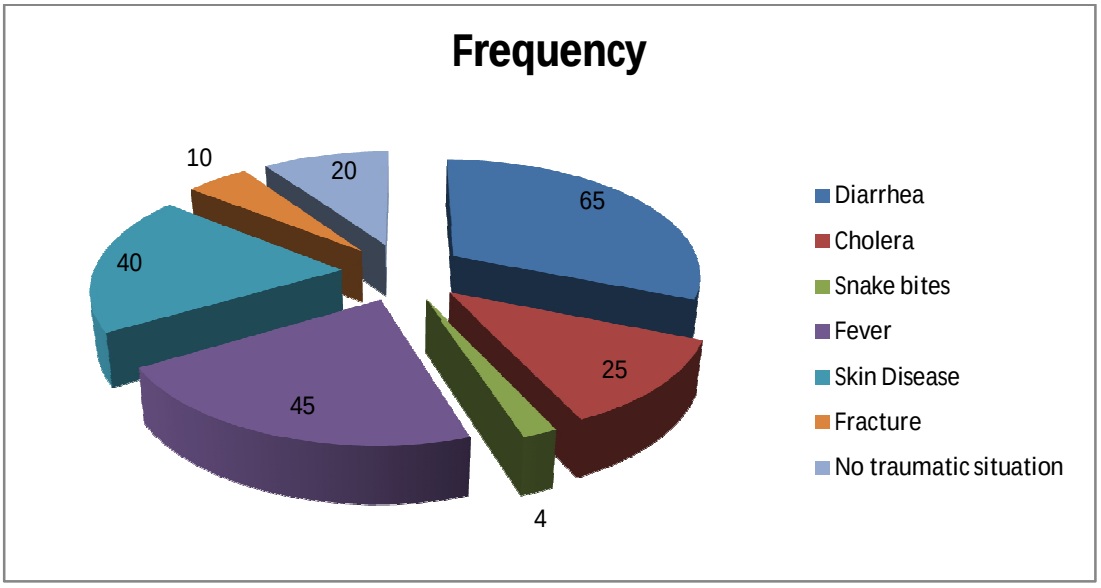


The table shows that drinking water is available for only percent respondent's percent respondents notice that pure drinking water is not available at disaster period.

Table 6.21: Types of disease suffered by the respondents

Types of Disaster	Frequency	Percentage
Diarrhea	65	54.17
Cholera	25	20.83
Snake bites	4	3.33
Fever	45	37.5
Skin Disease	40	33.33
Fracture	10	8.33
No traumatic situation	20	16.67

Source: Field work

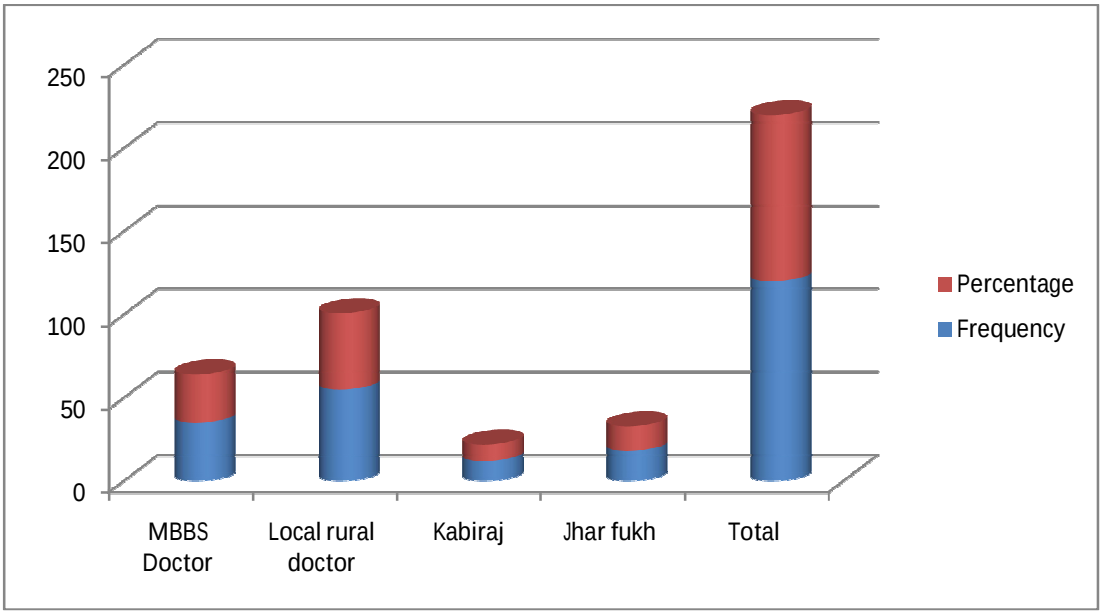


More than one answer is possible

Form the above table it is observed that most of the respondents suffers from diarrhea disease. 37.5% respondents suffers from fever and 33.33% respondents affected skin disease. Due to lack of pure drinking water, first aid and medical facilities peoples sufferer from different diseases. Especially women, children and elder people are more vulnerable situation during disaster. Disaster has its devastating impact of all areas of life physical, psychological, social and emotional and all these reactions are interlinked.

Table 6.22: Information about first aid and medical treatment getting by the respondents.

Sources of getting treatment	Frequency	Percentage
MBBS Doctor	35	29.17
Local rural doctor	55	45.83
Kabiraj	12	10
Jharfukh	18	15
Total	120	100

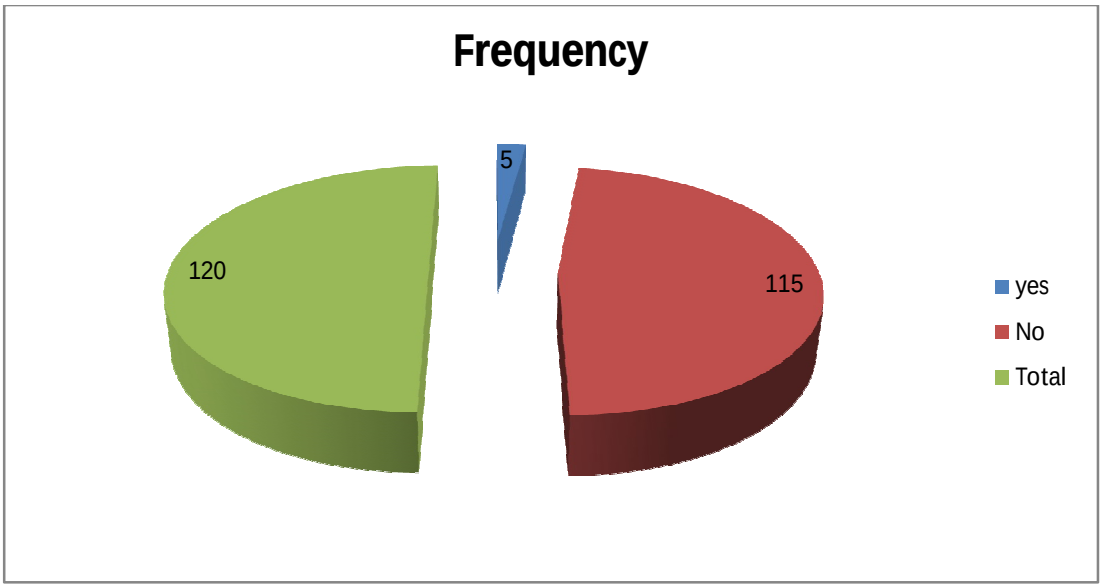


This table shows that only 29.17% respondents take the treatment by MBBS Doctors during or after disaster. It is noticed that a large number of people depend on rural quack physician for their treatment.

Table 6.23: Information about use of health sanitary Latrine of the respondents

Use of health sanitary Latrine	Frequency	Percentage
yes	5	4.17
No	115	95.83
Total	120	100

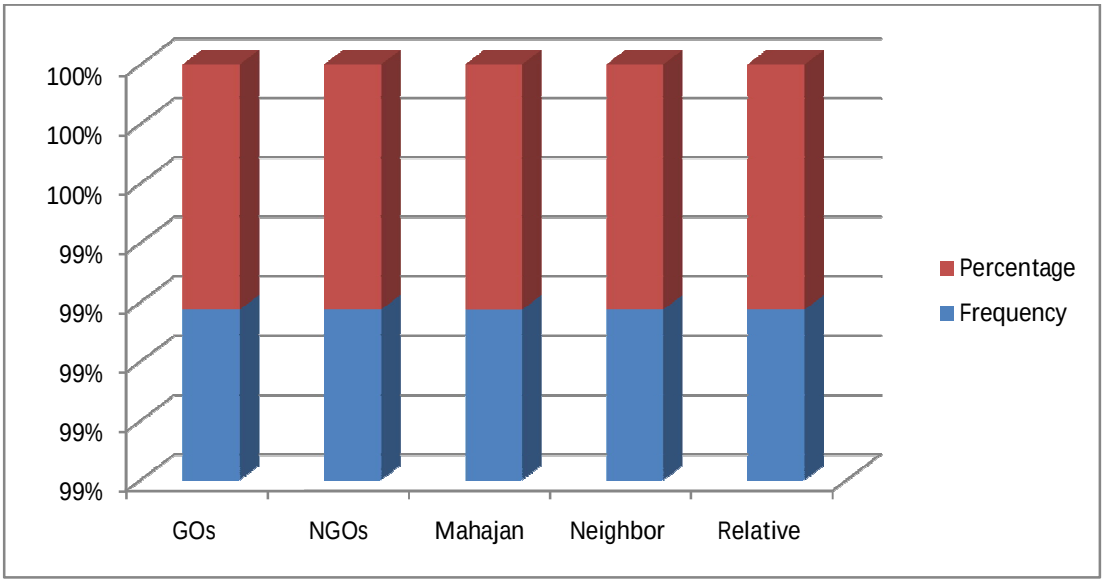
Source: Field work



Use of health sanitary latrine is an important indicator for maintaining good health. The above data indicate that only 4.17 percent respondents have the opportunity to use health sanitary latrine more than 95.83 percentrespondents do not get any opportunity to use healthy sanitary latrine. There is no separate latrine facility for women at shelter places.

Table 6.24: The agencies person from where the respondents receive instance.

Name of the agencies	Frequency	Percentage
GOs	35	29.17%
NGOs	45	37.5%
Mahajan	5	4.17%
Neighbor	15	12.5%
Relative	20	16.67%



Most of the respondents say that (37.5%) they received from NGOS. 29.17% respondents say that they receive assistance from GOs.16.67%respondents receive help from relatives, 12.5%respondents receive help from neighbor.

Table 6.25: Loses of different item in nature disaster.

Natural disaster is very common issue in our country. Almost every year natural disaster occurs in Bangladesh. This study area is a very much disaster prone areas. Cyclone, flood, tidal surge and river bank erosion has often visited this country with devastating consequences. So much so, that at different times these disasters took a heavy toll of human life and lead to immense loss of property.

Loses of item	Frequency	Percentage
Food item	80	66.67
Livestock	65	54.17
crops	70	58.33
house hold	90	75
Others	32	26.67

Source: Field Work.

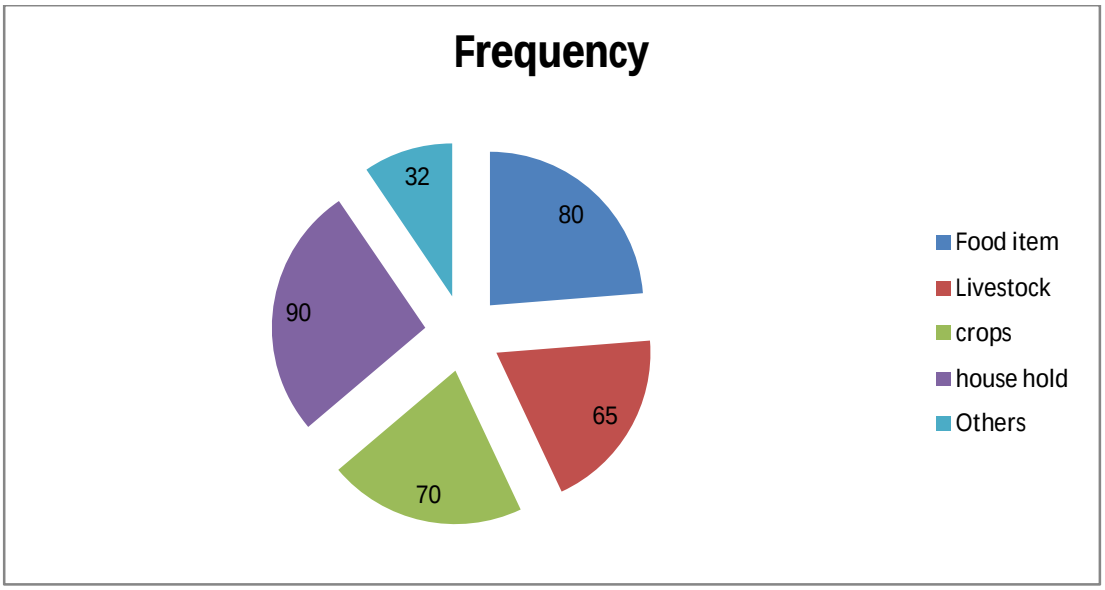


Table 23 Indicates that 66.67% of the respondents losses their food item, 54.17% respondents losses livestock, 58.33 Percent respondents damage crops and 75% of the respondents losses their households and 26.67% respondents losses their other assets.

Table 6.26: Coping strategies of the respondents coping strategies

As this area is very much disaster prone area. Most of the respondents are involved in different types of microcredit program during the disaster period. Most of the people are involved to credit program for coping this vulnerable situation.

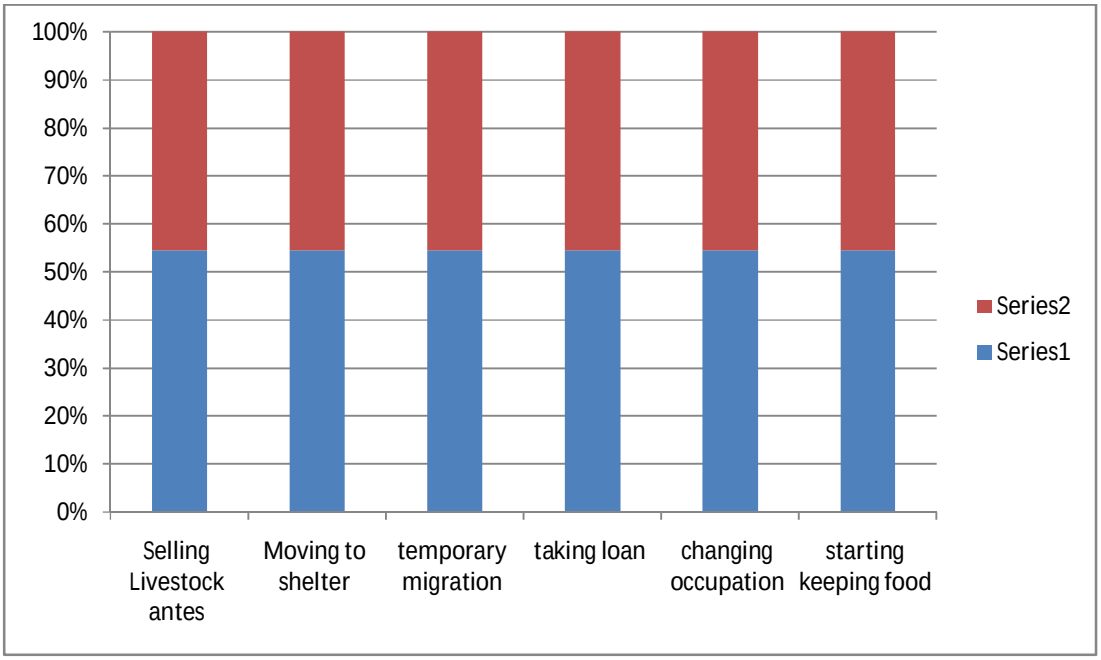
Loan from NGO	45	37.5
Project	-	-
Relative	15	12.5
Food	20	16.67
Help / Donation from GOB organization	30	25
Cash	10	8.33

Table 24: Shows that 37.5% of the respondents engaged with different types of NGO credit program such as BRAC, CARITAS, Muslim Aid, and other local NGO and taken loan form NGO during the different disaster period 12.5% respondent were taken loan form relative 16.67% respondent get food item from NGO and other organization 25% respondents get help or donation from organization GOs and NGOs. And 8.33% of the respondents get cash from relatives and other organization.

Table 6.27: Coping strategies with nature disaster.

During and after disaster period, most of the people try to cope with different ways such as, selling livestock or assets, taking loan from different NGOs.

Selling Livestock antes	75	62.5
Moving to shelter	25	20.83
temporary migration	55	45.83
taking loan	85	70.83
changing occupation	25	20.83
starting keeping food	15	12.5



This table shows that 62.5% respondent sell their assets or livestock, 70.83% respondents taken loan from different NGO, on the other hand 45.83% change their occupation.

Table 6.28: Nature of micro provided NGO nature of services.

Nature of Services	Frequency	Percentage
with interest	85	70.83
without interest	10	8.33
lower interest	25	20.83

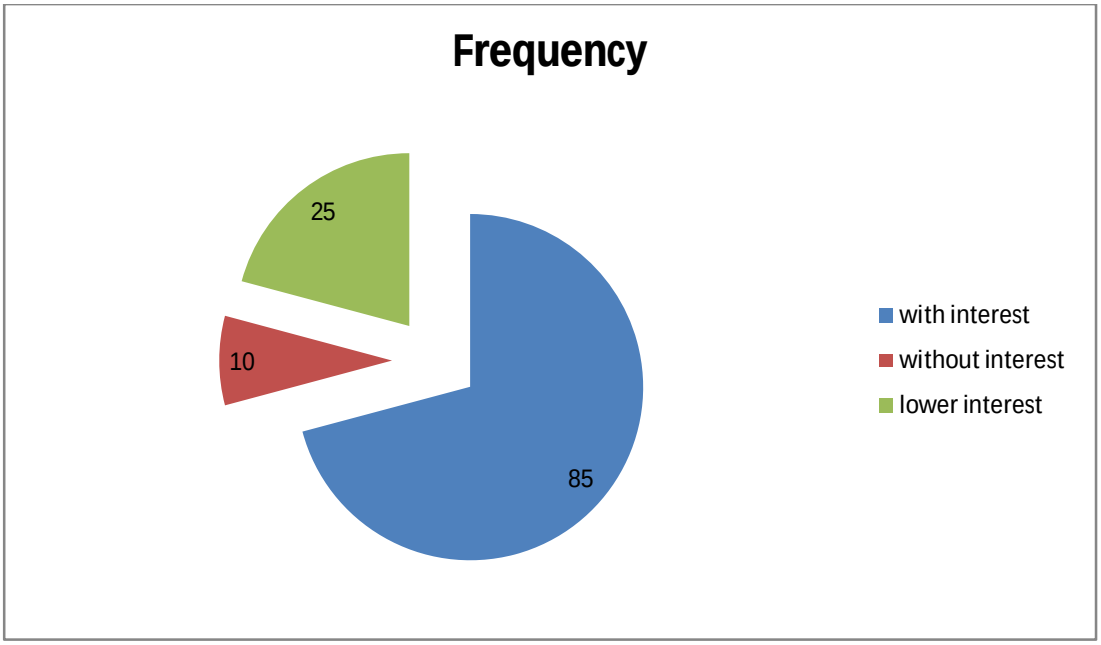
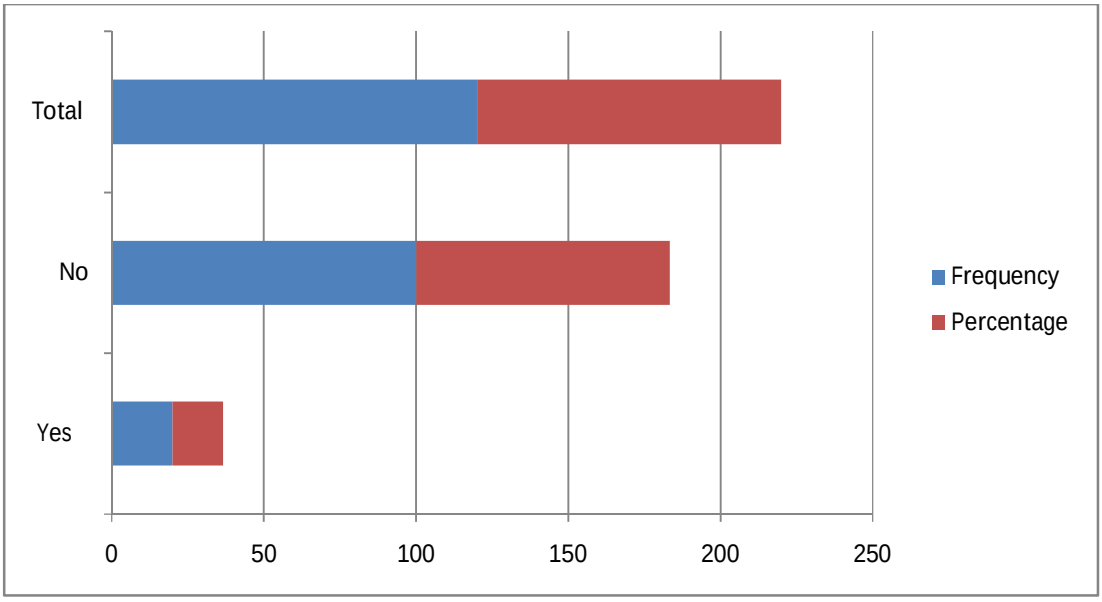


Table shows that 70.83% respondents taken loan from NGO with interest 20.83% respondents take loan with lower interest and only 8.33% respondents take loan without interest in disaster period.

Table 6.29: House facilities taken by the respondent often disaster.

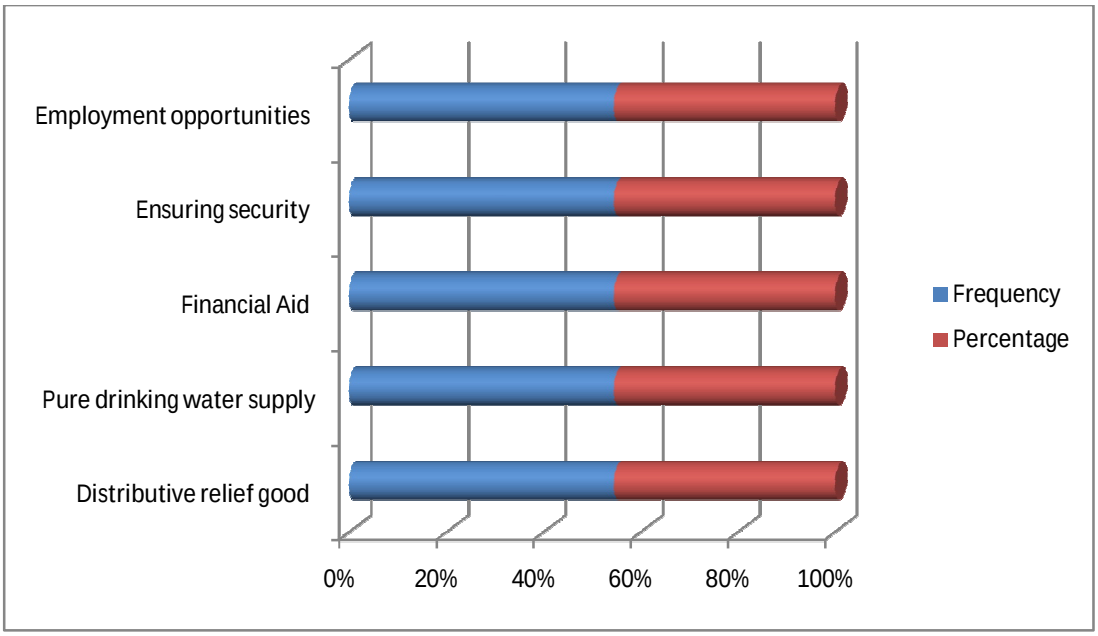
House Facilities	Frequency	Percentage
Yes	20	16.67
No	100	83.33
Total	120	100



After natural disaster, most of the affected people in Bangladesh do not get proper house facilities, in the study areas; it is found that only 16.67% of the respondents get house facilities. While more than 83.33% do not get any house facilities.

Table 6.30: Initiatives that should be taken to reduce miseries of people design disaster.

Initiatives (Multiple Answer)	Frequency	Percentage
Distributive relief good	75	62.5
Pure drinking water supply	65	54.17
Financial Aid	90	75
Ensuring security	37	30.83
Employment opportunities	55	45.83



In the study area, it is found that about 75% of the respondents think financial air or microcredit as an important source of their livelihood, while about 62.5% say that distribution of relief goods is another important factor. On the other hand 54.17% say that the supply of drinking water is also an important factor after natural disaster.

Table 6.31: Services provided by local administration services:

Services	Frequency	Percentage
Foods	120	100
Clothes	15	12.5
House building	90	75
Medical Aid	45	37.5
Pure drinking water	40	33.33
others	15	12.5

More than one answer was possible.

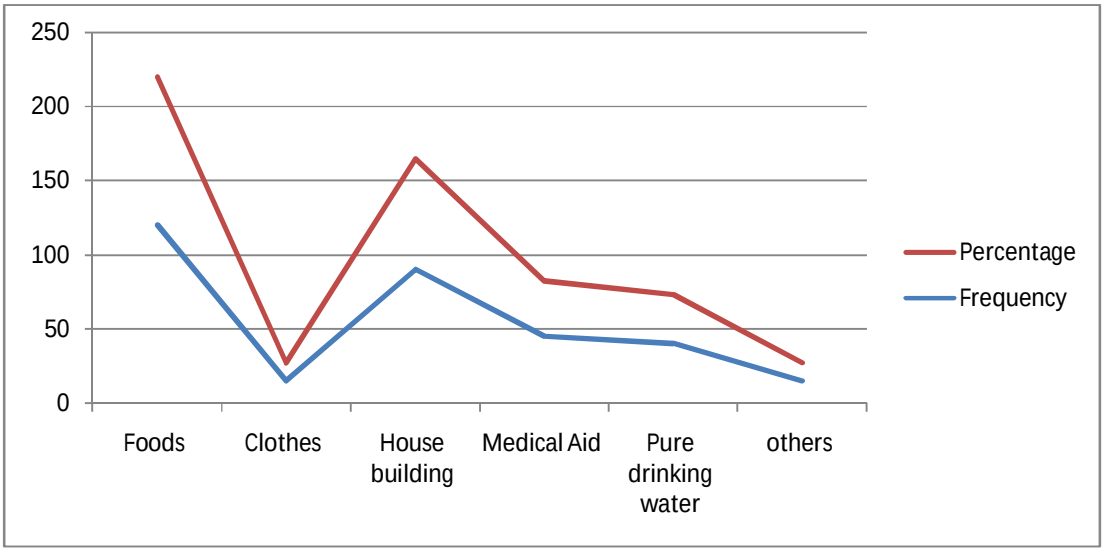


Table shows that most of the respondent says that local administration provided food items. 75% respondents say that local govt. provided loan for house building purpose 37.5% respondents say that help for medical aid during disaster period and 33.33% respondents say that local administration supply pure drinking water during disaster situation.

Table 6.32: Information about the working situation of the respondents before and after disaster.

Before disaster (work)	Frequency	Percentage	Types of work	Frequency	Percentage	After disaster (Work)	Frequency	Percentage
Household and various types of works	45	37.5	Day Labor	20	16.67	Household and various types of works	15	12.5
Household works	75	62.5	Maid servant	5	4.17	Household works	65	54.17
Total	120	100	Agricultural work	15	12.5	Loss of work	40	33.33
			other	10	8.33	Total	120	100
			Total	50				

The above data show that 37.5 percent respondents are engaged in various types of work (day labor 16.67%, maid servant 4.17%, agricultural work 12.5% and other 8.33%) including household activities. 54.17 percent respondents are only engaged of their household activities before disaster. After disaster 33.33 percent respondents lose their jobs who are engaged in day labor, maid servant, agricultural and other activities. Besides, they report that they lose their household activities after disaster. This study shows that 33.33 percent disaster affected people cannot join their working place after disaster and therefore cannot earn which create the situation more vulnerable for them and their family.

Case studies

CASE STUDY-01

Hanufa, is twenty five, years old. Her husband's name is Malek mia and they live in mahmud pur village. She has one daughter and one son of six years old. Both her husband and she were engaged in a small business (small shop). Her family was in the cyclone shelter at Shymnagar during 2007 cyclone SIDR. Their work place remains closed due to inundation of that area. Their shop was under water. It was fully destroyed. So, Hanufa and her husband became workless. They were unable to maintain their family with this regular profession. During cyclone shelter they lead their life through receiving help from others. After a few days they felt acute of food scarcity. They depended upon relief. But they did not get, as they needed. Actually relief was not sufficient. They did not get any help from relatives.

Both of her daughter and her husband after some days were caught by virus fevered Diarrhea. Halima seems that this is not a serious disease to deal with but it became serious. This contagious disease attacked three of her house hold members. It was the time when she did not know what to do to control the high temperature of her daughters, son and her husband diarrhea. She was also unable to take them to the doctors. There was occasional visit of doctors but those treatments were in adequate for them. Besides she think it was not tough for her and her husband to find an alternative source of income during disaster period. But the cruel truth was her husband was sick and she had to attend her family members. She engaged with microcredit programs. She took loan money from local NGO. But loan money was not sufficient for them. Then, she took again loan money. With the help of loan money, she restarted her small business & tried to come back normal life.

CASE STUDY-02

Beena Rani, 27 years old. Her husband is SitalMondol, he is patient of paralyses. She has two sons. The villagers beaten him for a case of theft, which was not real. Now they are living in majhat village under shamnagarsadar. Beena had to face a lot of struggle in her life since her parents died when she was only 15 years old. At the age of 18 she fell in love with in upper caste hindue (Shital) boy who was a small shopkeepers and they married thereafter. But the hindu society never accepted between a girl of a lower caste and a boy of upper caste. So he hardly managed any work for their sustenance in the primary years. Now Shital is workless. So beena started a business with the help of another two girls. During disaster period (cyclone Aila) she only landed property and small shop were damage completely. They took shelter as a cyclone shelter union perished. But their she was not accepted by the villagers. So, she returned to her business house and took shelter on the roof. She passed in fear and starved. From then she was living on the basis of relief. After cyclone no work was available there.

And she did not get VGF card available also. On that time she involved in credit programs. But loan money was not sufficient as they needed. She again started to do struggling to live on. With the help of rich villager she started her business again and bus managed to survive.

CASE STUDY-03

Kanak of 26 years, lives in ShymnagarSadar union. Her husband name is ManwarHawlader. Her husband is farmer. She has two sons and one daughter. They are living on a land of agriculture. Every year they affected by river erosion and storm surge. They loss their assets, crops for cyclone, river erosion and storm surge.

She was engaged with CARITAS. Besides, she makes a little poultry farm with the loan from CARITAS. During cyclone 2007, she was completely helpless. Her property on which she based on completely damaged by cyclone and her pisiculture locally called (Gher) was damaged. On that time she was attacked by the robber. From them they were helpless. They started to pass their day on starvation. After disaster the terrible life came to her. She managed a VGF card from union porished. But it was not sufficient for them. During cyclone she took emergency loan from NGOs. She bought two cows and invested loan money in agriculture and started to do courtyard gardening. After disaster her own initiatives thus helped her to survive to disaster.

CASE STUDY-04

Laila begum is 32 years old. Her husband is a shopkeeper, and they lives in nakipur village. She has two daughters and two sons. Every year they loss assets, crops for cyclone and river erosion and tidal surge. During disaster SIDR they lead their life through receiving help from others. After a few days they felt of acute of food scarcity. They depended upon relief. But they did not get as they needed. Laila Begum and her husband sometimes starved to sacrifice their food the children.

During cyclone their crops were fully damaged. On that time she sold poultry and livestock. She was involved in micro-credit program during the disaster period she had taken loan from NGOS (BRAC) but that was not sufficient for coping with the losses. Then she took loan again. Besides loan was not interest free. So loan money spent by repayment installment. On that period they get help or donation from different organization. But amount was not sufficient. And her husband was workless. She had to fight even after the disaster period with poverty. But she had to carry the struggle still as her husband was too vulnerable to carry the strenuous job for a while.

CASE STUDY-05

Almost all households experienced major damage to their houses. Especially women headed household's example rahela begum. She lives in nakipur village . She is 32 years old she has six family members. During disaster (cyclone) crop production of households (Rahelas owned or cultivated land) was totally lost they are living in agriculture. But their late aus paddy about to be barbered was inundated and hence destroyed. Other resources such as livestock poultry or fisheries and homestead gardens were also lost.

Livestock and poultry experienced health hazards due to lack of food fodder and places to stay. Her families could not move with their animals and beads the animal shelters were also damaged. Poultry and livestock were also attack with diseases. During the calamities vaccine and treatment were not available or the people had no means to travel for treatment. Rahela begum engaged with credit programs but credit money was too small for that situation. She lost their ducks chicken sheep goats homestead vegetables etc. But major lost came later as she was forced to sell these and other resources after the cyclones at throwaway prices. Fodder and feeds along with shelter should also be provided she to save their income generating livestock resources. During the disaster period, Rahela engaged with credit program (Progati). She took loan from this local NGO. On that time, loan money was more helpful for her family.

CASE STUDY-06

Jamila Begum, 36 is a house wife; she lives in gopalpur village west shymnagar under south zone in the district of Shatkhira. She has five members in her family. Her family has become a victim of tidal surge four times so far. Having lost everything including her own homestead, she is now leaving on the mercy of others. Three years ago her son came to Dhaka returned home. She earns her living through selling her labor as domestic aid and rearing poultry and hunger are their constant companions. She received relief good in the form of rice, pulse and other materials during the cyclone from the union parishad and a local NGO. She received emergency survival relief and house building support after the devastating aila of 2009. But her economic condition has not changed rather it has gone from bad to worse. She believes that she cannot come out of the trap of the vicious circle of poverty through the dispensation of relief. Her true emancipation lies in sustainable income generating activities, which she has been looking for all these years.

Chapter seven:
Recommendation & Conclusion

Recommendation:

Peoples, especially women and children of coastal areas of Bangladesh are the worst suffers in disaster. Government and some NGOs are trying to reduce the vulnerability of people of disaster affected areas. It is noticed that proper policy, planning , community based disaster management programs and good governance can also reduce any sort of hazard and can increase the socio-economic situation through different micro credit schemes in collaborate of government non-government and international agencies. In this regards following recommended can be made for mitigation and reducing suffering of the coastal affected people.

01. Legislation

To establish disaster risk reduction and climate change adaptation policy, legal and regulatory framework integrated with the development decision-making process at national, provincial and district levels with supporting legislation, policy, procedure, budgets, regulations, incentives, disincentives and enforcement processes.

02. Institution

To establishes and strengthens institutional systems that support decentralized disaster risk reduction and climate change adaptation integrated with local level development planning and decision-making processes through strengthened institutional partnerships, crisis management systems, knowledge sharing networks, DRR and climate change adaptation enhanced education program, formalized professional development and educational program and access to strengthened disaster risk reduction information decision-making support systems.

03. Education/Dissemination

To establish and strengthen education and awareness programs to make disaster and climate change adaptation linkages understood along with a better understanding of what preparedness entails and how to respond to early warnings.

04. Implementation

To demonstrate how disaster risk reduction and climate change adaptation actions are taken and physical changes made to reduce disaster risks to and economic impact (dev't setbacks) on communities as an integrated part of local-government development programs (city, provincial, district, sub-district, village), community based development, sect oral development, and hazard specific development programs and projects.

People participation is essential for effective planning and implementation of disaster management program.

- Women should be given priorities in all polices, planning and programs related to disaster management.
- It is essential to modernize the metrological and hydrological networks for forecasting and warning systems. Emergency response system and supporting livelihood strategies should be taken based on local realities, especially for women and children.
- Facilities should be made to preserve sufficient amount of drinking water during and after disaster.
- Construction of shelters should be well constructed with multi-purpose use and there should be separated facilities for women. Shelter should be constructed at a place where access of women will be direct and easy during the disaster.

- Transport networks should be developed to expedite movement and rescue people and other things during disaster.
- Community-based awareness raising program should be strengthened. Seminar, symposium and workshop will have to be arranged in coastal areas and ensure the participation of women in these program. Disaster mitigation strategies and disaster preparedness technique should be including in school, college and university level curriculum.
- GoB and NGOs should take infrastructure development and income generating activities for women in the coastal belts. It should be ensured that women have equal access to development activities.
- Local administration should take strong initiatives to avoid the events of theft, robbery and hijacking, torturing women and other unexpected events during disaster.
- It must be ensured that women have access to education and training program so that they can implement adaptation and coping strategies.
- More and more research should be conducted to find out the coping and mitigation strategy appropriate housing structure and other relevant issues for coastal areas of Bangladesh.
- To ensure women security.
- Distribute consumption items according to income-groups and focus on women and children in this regard.
- Emergency food distribution program for target groups need to be enhanced.
- A special food distribution programs should be taken up for pregnant group, lactating mothers and disabled women and children.
- Special medical facilities should be provided for disaster affected women and children.

- Cylinder gas should be distributed.
- Construction of a sufficient number of tube-wells at flood shelters, roads and embankments will help food victims.
- To ensure community participation in disaster management.
- To reduce knowledge gap between target group and management.
- All concerned departments should provide support services to their respective targets groups.
- Co-ordinate emergency rescue operation.
- GA-NGO collaboration.
- To establish disaster fund.
- Rescue relief and rehabilitation programs.
- Assistant for agriculture.
- Plantation in disaster vulnerable area.
- Training program capacity builds for local volunteers.

Conclusion:

In fine, we conclude that Bangladesh is the most disaster prone countries in the world. Bangladesh is worst victim of climate change and global warming in the world. Natural disaster is common phenomenon in this country and satkhira district is more vulnerable in natural disaster. People become more vulnerable in this changing situation. Actually, the social, economic, cultural, political and geographical context of Bangladesh. Women and children make them overall more vulnerable to climate change and natural disaster. In this study, the researcher has tried to find out the peoples vulnerability in coastal areas during and after disasters and tried to know their coping strategies. We know that, disaster is inevitable part of human life but it can be reduced. From these findings, it can be easily said that though their coping strategies have been recognized worldwide. These are inadequate for balanced and sustainable development. It is not possible on the part of a government to meet all the needs of disaster management everywhere. The participation of beneficiaries on self-help basis, especially in dissemination of warnings, preparedness, fighting, evacuation, relief and rehabilitation may greatly reduce loss of lives and properties and suffering to people.

Natural disasters are not wholly preventable, though with appropriate measures, they can certainly be reduced in intensity and frequently. The importance of people's participation in such disaster management efforts is obvious. Reduce in vulnerability of people especially women and children and institution can only be ensured with people's participation. It can be said that the authority and the implementing agency must ensure women's participation in every planning and development programs. Every national programs calls for people participation and involvement, if it is to succeed. Disaster preparedness and, in particular, are inoperable in the absence of

peoples participation. Preventive action is not only safer than cure, but as much more cost effective. People’s participation through community preparedness or awareness is the best way for disaster management.

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Interview schedule:

1. Socio-Demographic profile

Age	
Sex	
Occupation	
Religion	

2. Household Type: a. Nuclear

b. Joint

c. Extended

3. Number of household members

……..

4. Number of earning members……..

5. Monthly income of the household……..

6. Monthly expenditure of the household……

7. Land Ownership of the household……..

8. What types of natural disaster occur in those area……..

9. What types of natural disaster faced by the respondents……

10. Are you (respondents) getting warning signal of disaster…….

11. Shelter center are available in those area……

12. What types of facilities getting by the respondents in the shelter center?

13. Are you facing unexpected events in shelter center during disaster?

14. Information about the necessary food stored.....

15. Information about the necessary types of food.....

16. Information about capacity for buying food and medicine during disaster.....

17. Information about the availability of drinking water during and after disaster.....

18. What types of disease suffered during and after disaster?

19. Information about first aid and medical treatment.....

20. Information about use of healthy sanitary latrine of the respondents during and post disaster.....

21. The working situation of the respondents before and after disaster.....

22. The role of local government-

warning, evacuation, support to shelter

23. Loses of different item during the period of natural disaster: a. Food item

b. households c. Livestock d. Crops and others.

24. Information about coping strategies of the respondents.....

25. Nature of micro-credit provide NGO.....

26. House facilities taken by the respondents after natural disaster…….

27. Initiative that should be taken to reduce miseries of women during disaster.....

28. Information about services provided by local administration.....