

**IMPACT OF CASH BASED INTERVENTIONS IN  
LIVELIHOOD RECOVERY OF WATERLOGGING  
AFFECTED COMMUNITY IN SATKHIRA DISTRICT**



A Dissertation for the Degree of Master in Disaster Management

by

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**Spring 2016**

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## **Acknowledgements**

I would like to offer my gratitude to the most vulnerable waterlogging affected community who have extended their full cooperation through participating in my study and dedicated their most valuable time for this research. Without their cooperation the research work could not be successful.

I would like to give the sincere thanks to my colleagues of ACF based in Satkhira and colleagues of Shushilan (a national NGO working for long time with the waterlogging issue in South-west region of Bangladesh) who have provided all out support and insightful suggestion in developing the study tools and providing various documents to make the study successful.

I would like to express my sincere thanks to Dr. Md. Humayun Kabir, Professor, Department of Geography, Dhaka University and Course Supervisor and guide for his generous guidance and direction which made it possible to complete the final report of the study.

I am also very much grateful to ACF Bangladesh for the official and financial patronization to make this Post Graduate Program in Disaster Management (PPDM) as well as the study finally happen. Special thanks to Mr. Damien Joud, my line manager in ACF for all kind of support.

A lot of thanks to my friends of Post Graduate Program in Disaster Management (PPDM) of BRAC University for their valuable comments and suggestions regarding the study that has encouraged me to complete the study as well as to complete the final report.

Finally, I am deeply indebted to my beloved wife Shukla Chakraborty and dearest daughter Ananna Chakraborty for giving me continuous support and mental courage and taking responsibility of all kind of family affairs to make me fully concentrates on the study throughout the program without what I doubt I could complete this program as well as the study.

## Abstract

The coastal districts of SWB have been experiencing waterlogging problem since the early 1980s. Natural drainage systems over a large part of this area were totally disrupted, as a result, with most of the effective natural water collection and drainage system blocked by the polders. The situation has aggravated greatly since 2011 as a result of multi-dimensional causes accrued from both natural and manmade disaster. In 2013, this was about 28% of the land area in the affected Upazilas and remained waterlogged for more than 8 months. Long term inundation prevents the cultivation of most of the crops normally cultivated in this area resulting in very significant economic loss to the households. The main affected groups due to water logging in these Upazilas are landless day laborers, small and marginal farmers, who faced major losses in terms of livelihoods or source of income (from land or labor). Small and marginal farmers have lost their livelihoods and casual day laborers have lost employment opportunity, consequently fall in chronic food insecurity. Affected people had to rely on negative coping strategies such as selling productive assets, spending previous savings, migration and borrowing for survival.

Humanitarian intervention has started in 2012 by International NGOs and UN agencies. As markets were functional, Cash Based Intervention (CBI) was carried out to support the affected population to meet the immediate food security need and livelihoods recovery. Different survey and project reports say that total 44,210 most vulnerable households affected by waterlogging received BDT 465, 934,000 in three districts up to December 2015. This study aims to evaluate if these CBIs helped the beneficiary households for recovery of the livelihoods and contributed to enhance their resilience against flood and waterlogging.

The study used 7 parameters to understand if the beneficiaries managed to recover the livelihoods they lost due to waterlogging. These are – 1) Changes in occupation and livelihoods strategies 2) Adoption of alternative and diversified livelihoods options 3) Recuperation of household assets 4) Increase of total asset value 5) Reduction of burden of debt 6) Increased monthly income 7) Improvement of community infrastructures. Waterlogging affected households shifted from traditional occupations like agriculture farming and casual day laborers to new occupation and livelihoods strategies. Number of main occupation increased from 4 types (before waterlogging)

to 8 in 2016. All of the respondent households now have at least 2 livelihoods options and out of them 44% currently have 3 livelihoods options. Beneficiaries managed to regain almost all productive assets except cultivable land. Average number of cows and goats surpassed the number before waterlogging. Total value of assets stood at BDT 123, 442 and surpassed the asset value of 2010 by BDT 32,094. Burden of loan per household reduced from BDT 13,917 to BDT 7,966. Monthly income has increased in average BDT 2800 compared to the monthly income before waterlogging.

Therefore, CBIs found very much effective in recovery of livelihoods of the waterlogging affected marginalized households and built their resilience to cope with the waterlogging condition. It also contributed a lot by reducing future risk of waterlogging through rehabilitation of the community infrastructures and making them functional.

## Table of Contents

<i>Acknowledgements</i> .....	<i>ii</i>
<i>Abstract</i> .....	<i>iii</i>
<i>List of Tables</i> .....	<i>vii</i>
<i>Lists of Figures</i> .....	<i>viii</i>
<i>List Acronyms</i> .....	<i>ix</i>
<b>Chapter 1</b> .....	<b>2</b>
<b>INTRODUCTION</b> .....	<b>2</b>
1.1 General Background .....	2
1.2 Problem Statement .....	3
1.3 Justification of the Study .....	5
1.4 Objective of the Study .....	6
1.4.1 Overall Objective.....	6
1.4.2 Specific Objectives.....	6
1.5 Research Questions.....	7
1.6 Scope and Limitation of the Study.....	7
1.7 Latest Knowledge Development on Waterlogging .....	8
1.7.1 Definition of Waterlogging .....	9
1.7.2 Historical Context of Waterlogging in Bangladesh .....	10
1.7.3 Waterlogged Area in Bangladesh .....	10
1.7.4 Waterlogging in Satkhira District.....	11
<b>Chapter 2</b> .....	<b>13</b>
<b>METHODOLOGY AND APPROACHES</b> .....	<b>13</b>
2.1 Framework of the Study.....	13
2.2 Study Area Selection.....	14
2.3 Respondent's Profile.....	17
2.4 Sampling Design.....	19
2.4.1 Sampling Procedures and Methods.....	19
2.4.2 Sample Size Determination .....	19
2.4.3 Sample Households Selection.....	20
2.5 Data Collection Method .....	20
2.5.1 Primary Data Collection .....	20
2.5.2 Secondary Data Collection .....	21
2.6 Data Processing, Cleaning and Analysis.....	21
<b>Chapter 3</b> .....	<b>22</b>

<b>PROFILE OF THE STUDY AREA.....</b>	<b>22</b>
3.1 Characteristics of Waterlogged Area.....	22
3.1.1 Physical Settings.....	22
3.1.2 Topography.....	23
3.1.3 Soil Resources.....	23
3.1.4 Natural Resources Characteristics.....	24
3.1.5 Weather and Climate.....	25
3.1.6 Hydrology.....	27
3.1.7 Main Livelihoods Groups and Effect of Waterlogging.....	28
3.2 Cash Based Interventions.....	30
3.2.1 Projects Description.....	30
3.2.2 Total Coverage of the Cash Based Intervention.....	31
3.2.3 Total Amount of Cash Transferred So Far.....	31
<b>Chapter 4.....</b>	<b>33</b>
<b>CASH BASED INTERVENTIONS AND IMPACTs.....</b>	<b>33</b>
4.1 Occupational Status.....	33
4.1.1 Occupations before Waterlogging.....	33
4.1.2 Current Occupational Status.....	34
4.1.3 Changes in Occupation after Waterlogging.....	34
4.2 Status of Household Assets.....	35
4.2.1 Status of Productive Assets.....	36
4.2.2 Status of Total Asset Value.....	39
4.3 Burden of Debt.....	40
4.4 Overall Impact of Waterlogging on Livelihoods.....	40
4.5 Coping with Waterlogging.....	41
4.6 Support Received from Different Agencies.....	42
4.7 Type of Investment by the Beneficiaries.....	43
4.8 Monthly Income and Expenditure of the Households.....	43
4.9 Food Security Situation.....	44
4.10 Community Perception on Future Risk of Waterlogging.....	45
4.11 Impact of Cash Based Interventions on Livelihoods.....	45
<b>Chapter 5.....</b>	<b>49</b>
<b>CONCLUSION AND RECOMENDATIONS.....</b>	<b>49</b>
5.1 Conclusion.....	49
5.2 Recommendations.....	50

### List of Tables

<b>Table no.</b>	<b>Title</b>	<b>Page</b>
Table 1.1	Waterlogged areas in Bangladesh	11
Table 3.1	Topography of Waterlogged areas	23
Table 3.2	Coverage of cash based interventions	31
Table 3.3	Total amount of cash transferred	32
Table 4.1	Food Consumption Score	44

## Lists of Figures

Fig. no.	Title	Page
Fig. 2.1	Satkhira district map	15
Fig. 2.2	Satkhira Sadar Upazila map showing the study union	16
Fig. 2.3	Map of Labsa union showing the wards selected for the study	17
Fig. 2.4	Study respondent's age	18
Fig. 2.5	Family type of the study respondent's	18
Fig. 3.1	Temperature pattern in Satkhira	25
Fig. 3.2	Rainfall pattern in Satkhira	26
Fig. 4.1	Major occupation of the respondents before waterlogging	33
Fig. 4.2	Secondary occupation of the respondents before waterlogging	33
Fig. 4.3	Current major occupation of the respondents	34
Fig. 4.4	Current secondary occupation of the respondents	34
Fig. 4.5	Changes in land ownership	36
Fig. 4.6	Average number of livestock and poultry per household	36
Fig. 4.7	Percentage of household with non-agro-based productive assets	37
Fig. 4.8	Percentage of households with non-productive assets	38
Fig. 4.9	Ownership of gold (gram/household)	38
Fig. 4.10	Status of asset selling (% of households)	39
Fig. 4.11	Percentage of household who have sold assets (by type)	39
Fig. 4.12	Value of total asset of the household	40
Fig. 4.13	Source of loan	40
Fig. 4.14	Average debts per household	40
Fig. 4.15	Source of cash support	42
Fig. 4.16	Type of investment by the respondents	43
Fig. 4.17	Expenditure pattern of the respondent households	44
Fig. 4.18	Community perception on future risk of waterlogging	45



## List Acronyms

ACF	Action Contre la Faim
AEZ	Agro-Ecological Zone
BRAC	Bangladesh Rural Advancement Committee
BDT	Bangladeshi Taka
BWDB	Bangladesh Water Development Board
CBIs	Cash Based Interventions
CRA	Community Risk Assessment
CFT	Cash for Training
CFW	Cash for Work
CEP	Coastal Embankment Project
DFID	Department for International Development
ECHO	European Community Office for Humanitarian Aid and Civil Protection
FAO	Food and Agriculture Organization
FCS	Food Consumption Score
FGD	Focus Group Discussion
GDA	Ganges Development Area
GoB	Government of Bangladesh
HHs	Households
ICZMP	Integrated Coastal Zone Management Project
INGO	International Non-governmental Organization
KII	Key Informant Interview
LGED	Local Government Engineering Department
LCG	Livelihoods Cash Grant
NGO	Non-governmental Organization
OECD	Organization for Economic Cooperation and Development
OM	Organic Matter
SIM	Subscriber Identity Module
SRDI	Soil Research and Development Institute
SWB	South West Bangladesh
TRM	Tidal River Management
UP	Union Parishad
UDMC	Union Disaster Management Committee
UCG	Unconditional Cash Grant
UN	United Nations
WARRPO	Water Resource Planning Organization
WFP	World Food Program

*Chapter 1*  
**INTRODUCTION**

### **1.1 General Background**

The south-west region of Bangladesh forms part of the greater Ganges Flood Plains, an extremely complex and sensitive hydraulic system. This hydraulic system relies on a delicate balance between flows of water from two directions, downward flows from the source river, the Ganges-Padma and its drainage tributaries, as well as upward flows of sediment-laden estuarine rivers from the Bay of Bengal. The region is very low in elevation with only few meters (3 to 5) high from sea level.

The delicate balance of the system has been severely disrupted by various human activities in last 50 to 100 years, the full consequences of which are now being felt. Due to some major adjustment to the Ganges-Padma river, in particular the construction of the Farakka dam, the downward flow of water through drainage tributaries have been significantly reduced and in some cases completely ceased, meaning that the normal and essential flushing of river sediment and silt in minor rivers no longer happens. To further complicate the situation, some major infrastructural changes were made within the same south-west region of Bangladesh in 1960s with construction of major polders embankments to protect agricultural land from tidal flooding and saline intrusion. These embankments altered the normal flow and drainage movements, especially into low lying areas of the flood plain (beels) eventually resulting in total sedimentation of minor river beds. This was most severe in the stretches of the river where the up-flowing estuarine water normally reaches its upper tidal limit, slowing to zero velocity (occurs every twelve hours) and leading to deposition of sediment. These blockages are kilometers long not a matter of a few hundred meters.

On the rivers that have essentially total blockages, caused by sedimentation, no drainage from above the silted up areas is possible, referred to as drainage congestion. When the annual monsoonal rain falls, averaging around 1.7 meters per year, this water builds up with no-where to go, resulting the static flooding. Flood height can be measured in meters, not centimeters, remains in place for as long as 8 months in some places. This is referred to in Bangladesh as “waterlogging”, albeit a slightly misleading term in that it is technically a form of flooding not waterlogging as such.

This static flooding inundates entire villages and their agricultural fields every single year in many parts of Satkhira for last 15 years with increasing severity.

## **1.2 Problem Statement**

The south-west part of Bangladesh, is known as the ‘Ganges Tidal Floodplain – West’, subject to occasional floods from upstream and daily tides from the Bay of Bengal. As a natural system, far upstream was defined as a freshwater ecosystem and the downstream areas were estuarine/marine. In between, a whole section of the land and rivers over a distance of about 75 km (where waterlogging now occurs in Satkhira and Jessore) was subject to extremes of daily, monthly, and annual flooding (from tidal incursion, tidal back-pressure, and upstream river flooding, in constantly fluctuating combinations, as well as occasional storm surges) and high variability of salinity in the watercourses and beels, depending on rainfall, river flooding, and tidal incursion.

Natural drainage systems over a large part of this area were totally disrupted, as a result, with most of the effective natural water collection and drainage system blocked by the polders. On the other hand, the Farakka Barrage reduced the upstream river discharge into the southwest part of the country in the dry season (the Gorai River, and many parts of the upper river system dried up), and tidal incursions, along with suspended sediments, therefore moved much further up the remaining river system (not being countered by river discharge flowing to the sea). This increased river water salinity further inland and increased the sedimentation rate at the ‘drop-out’ points where velocities were minimal. These new accreting sediments were not flushed out, due to generally reduced river discharge from upstream. With inadequate slopes, poor gradients, river channels not deep enough, and frequent choke points (human-made and natural), any excess water in villages or rice-growing areas (floods from rain, river overflow, or high tides, and subsequent waterlogging) have nowhere to go.

Some areas of southwest (Satkhira Jessore and Khulna Districts) may experience waterlogging for up to six months after the monsoon (normally, localized monsoon flooding would dry up by late November). Waterlogging has been a regular phenomenon for the hundreds of villages adjacent to the Kopadak and Betna River in Satkhira and Jessore Districts since 2000. In at least four of the last ten years (2006, 2009, 2011, and 2013), the southwest area experienced extensive waterlogging. In

2013, this was about 28% of the land area in the affected Upazilas.

Even the implementation of preventive measures may not be effective, and waterlogging can continue. For example, despite partial re-excavation of the Kobadak River and inter-connected drainage canals in 2013, the adjacent area of the Kobadak basin has again experienced waterlogging, and Tidal River Management (TRM), implemented in Teka-Hari River area in Jessore, did not result in any measurable change in waterlogging in adjacent areas. In addition to the waterlogging problem (from excessive monsoon rains), increasing tidal incursions in the southwest are resulting in higher river salinity. When breaches in embankment occur, high tides can then lead to saline water flooding in areas that previously might have just been exposed to fresh or low-salinity water. This clearly has huge implications for agriculture production systems, and presents a confusing scenario for selecting appropriate adaptive responses.

Given the above geo-physical scenario and socio-political context, it is apparent that people in waterlogged areas have to live with water. However, the most precious question is how? Because of changes in geo-physical settings people's indigenous knowledge is not working. Waterlogging affected people especially who have lost livelihoods do not know how to cope with new situation. Unfortunately there was no big research initiative undertaken by the government research institutions on adaptive technology development for waterlogging areas. Affected people are in immense need of land and water based new farming practices and techniques that can support people to undertake adaptive livelihoods strategies to better cope with persistent waterlogging.

Long term inundation prevents the cultivation of most of the crops normally cultivated in this area resulting in very significant economic loss to households and villages. Significant quantities of T. Aman, Boro rice, winter vegetables and cash crops including betel leaf, oilseeds, jute and sugar cane were normally produced in this region. Flood and persistent water logging made the T. Aman paddy cultivation (one of the major crop) impossible in this region. Scope of Boro paddy cultivation including Rabi season crops and vegetables has narrowed down severely because of stagnant water.

Most communities in the southwest affected waterlogging have few options for self-response or recovery. This reflects their limited capacity for coping strategies (lack of

technologies, funds, or knowledge of alternative livelihoods). Studies in Satkhira area have indicated that with prolonged waterlogging, the poverty and nutrition situation quickly worsens, and negative coping strategies are adopted (FAO Mapping Exercise, 2015).

The coastal districts of SWB have been experiencing waterlogging problem since the early 1980s. The situation has aggravated greatly from 2011 as a result of multi-dimensional causes accrued from both natural and manmade disaster. At the homestead level the direct impact of flood is loss of shelter, loss of animals, loss of sensitive plants including fruit trees, less access to safe water and food, loss of basic services such as health and education. Flood and persistent water logging made the Aman paddy cultivation (one of the major crop) impossible in this region. Scope of boro paddy cultivation including Rabi season crops and vegetables has narrowed down severely because of stagnant water. As a result, the main affected groups due to water logging in these Upazilas are day laborers and marginal farmers, who face major losses in terms of livelihoods or source of income (from land or labor). Both these groups earn their livings by means of agricultural practice (cultivation of boro and aman rice), which is completely lost when there is water logging. Other minor sources of income include homestead production and livestock/poultry, which is also severely affected due to water logging. Affected people had to rely on negative coping strategies such as selling of livestock/assets, spending previous savings, migration and borrowing for survival.

### **1.3 Justification of the Study**

Waterlogging has become as a persistent phenomenon in south-west part of Bangladesh especially in Satkhira since 2011. Because of the waterlogging, this region has experienced a paradigm shift in production system from crop to aquaculture based production system as rice cultivation was impossible because of standing water. Small and marginal farmers have lost their livelihoods and casual day labors have lost employment opportunity and fall in persistent food insecurity. Humanitarian intervention started in the beginning of 2012 by the NGOs (both by national and international NGOs) and UN agencies. As markets were functional, cash based interventions were carried out to support the affected population to meet the immediate food security need. Following the emergency response, early recovery and recovery responses were carried out by the INGOs and UN agencies to help the most vulnerable affected population for recovery of the livelihoods. Different survey and

project reports say that total 44,210 most vulnerable households affected by waterlogging has received BDT 465, 934,000 in three districts up to December 2015. Out of three waterlogging affected district, highest amount of cash was distributed in Satkhira district. In this district 12,012 most vulnerable affected households got in total BDT 188,216,000 (BDT 15,670 per household) as cash grant to meet immediate food security need and recovery of livelihoods. Cash based interventions aimed rehabilitation and reconstruction of the damaged or dysfunctional community infrastructures to give physical protection against flood and waterlogging. In addition cash based interventions also aimed to support the most vulnerable affected community for restarting the livelihoods that was lost due to flood and persistent waterlogging. Projects focusing on cash based intervention also aimed to build capacity of the households for a resilient livelihood through adaptive and diversified livelihoods options.

However, despite a substantial amount of cash distributed in waterlogging areas under Satkhira and other two districts, any formal study or survey was not carried out yet to see the impact of this cash based interventions in recovery of the livelihoods of the most vulnerable waterlogging affected households. This study aims to evaluate if the cash grant helped the beneficiary households for recovery of the livelihoods. The study also aims to look if the cash based intervention contributed to enhance the resilience of the households against flood and waterlogging through alternative and diversified livelihoods options.

## **1.4 Objective of the Study**

### **1.4.1 Overall Objective**

The broader objective of the study is to assess the effectiveness of the Cash Based Interventions in livelihoods recovery of waterlogging affected people in Satkhira district.

### **1.4.2 Specific Objectives**

- To evaluate the effectiveness of the cash based interventions in livelihoods recovery.
- To assess the contribution of Cash Based Intervention (CBIs) in livelihoods diversification of the community to cope with waterlogging.
- To understand people's perception on cash based interventions.

## **1.5 Research Questions**

- What were the socio-economic context and major economic activities in this area before waterlogging?
- How the livelihoods options of the landless day laborers, small and marginal farmers affected by waterlogging?
- What are the coping strategies undertaken by the waterlogging affected community?
- What type of interventions undertaken by the NGOs and UN agencies for recovery of livelihoods?
- Who were the targeted households for cash based intervention?
- What changes have occurred in the livelihoods of the waterlogging affected most vulnerable people due to the cash based intervention?

## **1.6 Scope and Limitation of the Study**

Main audience of the study is land less day laborers and small and marginal farmers. According to the evidences (surveys, studies, needs assessments etc.) they were the most affected people in the waterlogging affected areas. Small and marginal farmers have lost their livelihoods and income and landless day laborers have lost employment opportunities. Cash based interventions by the humanitarian agencies mainly targeted these two most vulnerable groups and provided cash grant support to them for restarting and recovery of livelihoods. Hence, the study covered these two occupational groups in the community who have received cash support to see the impact of the Cash Based Interventions in recovery of the livelihoods lost due to the waterlogging. Other occupational groups were not covered in this study.

Moreover, the waterlogging problem have started in this region since 1960s as a consequences of construction of Polders to protect the crop land from tidal water and withdrawal of water by India from upstream through construction of Farakka Barrage. But it has become as a severe and persistent phenomenon in study area in 2011 and continued up to the end of 2015. Hence, to avoid the complexity, the study considered the year 2010 as normal year to evaluate and compare the income and livelihoods assets loss due to waterlogging in 2011 and subsequent years. Similarly, due to the interventions by the governments, UN agencies, international and national NGOs, to

reduce the waterlogging risk and substantial amount of cash was transferred to the affected beneficiaries' households from the year 2012 to end of 2015. As a result the study considered up to the year 2015 to evaluate the impact of cash based interventions in livelihoods recovery of the affected beneficiaries' households.

The researcher recognized some limitations for the present study given that very few or no formal study was carried out before on this subject matter. Major limitations are:

- There is very limited number of study or formal research carried out on waterlogging in Bangladesh. As a result, very limited number of literature (articles, formal research report etc.) was available for review.
- Cash based interventions are new in Bangladesh. International NGOs and few UN agencies have piloted it in 2013 as flood emergency response and early recovery of affected community. That means it has been practiced in Bangladesh only for 2 or 3 years. No formal study was conducted on cash based interventions. Only few project report developed by implementing NGOs are available for review and source of secondary information.
- Time allocated for this study was very limited. It is very difficult to review all relevant study/survey papers, project documents, reports and primary data collection, data analysis and interpretation for quality findings and recommendation within this stipulated time.
- Because of time constraints small study area was considered. As a result, the study area might not be representative enough.
- Small sample size was taken for primary data collection for the study. This sample size might not be statistically representative.

### **1.7 Latest Knowledge Development on Waterlogging**

Secondary data and existing document review provides clear understanding about waterlogging and latest development of knowledge on the management of this problem. Hence it is very much useful and important for carrying out a research. Different study and research documents were studied for development of concept for the study. Relevant journals, articles, books, research work, study reports, project reports, publications etc. were reviewed for accomplishing the research.



### **1.7.1 Definition of Waterlogging**

According to the OECD, waterlogging is the natural flooding and over-irrigation that brings water at underground levels to the surface. As a consequence, displacement of the air occurs in the soil with corresponding changes in soil processes and an accumulation of toxic substances that impede plant growth.

FAO Water Development & Management Unit defined waterlogging as the state of land in which the subsoil water table is located at or near the surface with the result that the yield of crops commonly grown on it is reduced well below for the land, or, if the land is not cultivated, it cannot be put to its normal use because of the high subsoil water table. Drainage of irrigated land is required to reduce waterlogging and that inevitably accompanies waterlogging in arid zones.

Waterlogging refers to the saturation of soil with water. Soil may be regarded as waterlogged when the water table of the groundwater is too high to conveniently permit an anticipated activity, like agriculture. In agriculture, various crops need air (specifically, oxygen) to a greater or lesser depth in the soil. Waterlogging of the soil stops air getting in. How near the water table must be to the surface for the ground to be classed as waterlogged varies with the purpose in view. A crop's demand for freedom from waterlogging may vary between seasons of the year, as with the growing of rice (*Oryza sativa*). In irrigated agricultural land, waterlogging is often accompanied by soil salinity as waterlogged soils prevent leaching of the salts imported by the irrigated water. From a gardening point of view, waterlogging is the process whereby the soil blocks off all water and is so hard it stops air getting in and it stops oxygen from getting in.

Waterlogging refers to soaking of agricultural land caused by a rising water-table [the surface of groundwater in the soil] or excessive irrigation. Waterlogging compacts soil, deprives roots of oxygen and contributes to salinization (Green Facts).

Waterlogging refers to the saturation of soil with water. Soil may be regarded as waterlogged when the water table of the groundwater is too high to conveniently permit an anticipated activity, like agriculture. In agriculture, various crops need air (specifically, oxygen) to a greater or lesser depth in the soil.

Waterlogging is a form of natural flooding that occurs with over-irrigation and water that rises from underground levels to the surface. This causes water in the soil to become displaced, natural processes in the soil are affected and there is a buildup of toxic substances in the soil, which can cause problems with the growth of plants in the immediate area.

### **1.7.2 Historical Context of Waterlogging in Bangladesh**

Water logging has been affecting about one million people in Bangladesh during the past two decades leading to large scale damages to crop, employment, livelihoods, and national economy. Water logging involves deterioration of drainage condition in coastal rivers of south-west Bangladesh causing difficulties towards maintaining livelihoods (Rahaman A. 1995).

The Coastal Embankment Project (CEP) of early 1960s and the commissioning of Farakka Barrage in 1975 had a negative impact upon the geo morphological characteristics of south west part of Bangladesh (Sarker MH. 2004) which accelerated the process of sedimentation in the riverbeds and sluice gates became inoperable. Unfortunately, climate change is likely to exacerbate the problem very soon (Huq et al, 1996).

Bangladesh is generally considered to be one of the most vulnerable regions in the world to climate change induced sea level rise. South west coastal region (the study area) is vulnerable to climate change induced sea level rise due to low elevation from sea level and a continuous process of land subsidence. As the Satkhira district is situated in the coastal zone, it would face increased water-logging due to increased flood volumes to drain and increased sea levels downstream. In addition the increased transport of sediments might also lead to sedimentation of riverbeds in the mouth of the estuaries, further hampering the drainage of the upstream rivers and estuary branches. South-western embankments might face occasional tidal overtopping, leading to saline water-logging within embanked areas. Under these circumstances, the study area is situated on a highly vulnerable position with the risk of increased future sedimentation and flooding.

### **1.7.3 Waterlogged Area in Bangladesh**

Waterlogged areas in Bangladesh are mainly in 3 south-western districts – Khulna, Jessore and Satkhira.

**Table 1.1: Waterlogged areas in Bangladesh**

District	Upazila	Waterlogged area (in ha)		
		2006	2009	2013
Jessore	Abhaynagar	4475	4001	2198
	Keshobpur	6322	9242	7905
	Manirampur	8374	6979	5596
Satkhira	Kalaroa	1292	3110	3741
	Satkhira Sadar	9086	15013	16046
	Tala	4904	16244	13683
Khulna	Dumuria	14370	16524	16813
	Fhultola	2101	2586	2210

Source-FAO mapping exercise 2015

#### 1.7.4 Waterlogging in Satkhira District

Bangladesh experienced heavy rainfall in July and August 2011 (413.8 mm against the monthly average of 332.1). Although it did not cause flooding in other parts of country, massive water-logging was created in the three coastal districts namely Satkhira, Jessore and Khulna. Satkhira being the most affected district was inundated by 5-7 feet of water that caused massive displacement in the population and severe destruction of houses, standing crops, homestead-based livelihoods and the local market.

GoB estimates that the affected number of households is as high as 200,000 (out of 390,000: GoB) in six Upazila (sub-district) of Satkhira. Water-logging in 2011 in Satkhira, arose as an acute problem of the chronic water-logging problem in the south-west coast of Bangladesh. Considerable parts of the region have been experiencing water logging almost every year since 2000 and water can often take up to six months to recede. Entire costal Bangladesh has been experiencing impacts of climate change in the form of rising sea levels, salinity intrusion and severe cyclonic events. This area has experienced two mega cyclones since 2007.

Water logging in the south west coast is not just related to heavy rainfall and extreme climatic events; it is also related to changes in the built-up areas themselves. Top water expert of the region, the late Ashraf-Ul-Alam Tutu, provides a historical description of the cause and consequences of the water-logging problem in the region. According to him, the south west coastal area is part of the tidal floodplain bounded in the north by the Ganges floodplain and in the south by the Sundarban mangrove tidal forest - the tidal floodplain is strongly influenced by tide, salinity and rainfall. This

plain is also crisscrossed by numerous tidal creeks or channels and has high drainage density. Through natural process the rivers carry both sweet water from upstream and tides from the sea. The major portion of the floodplain is low-lying, barely one meter above mean sea level and below high tide level. Homesteads, roads, vegetable gardens and orchards were developed on areas artificially raised by digging ponds and ditches. Daily tides used to inundate the lowlands twice a day. The Sundarban mangrove forest drops an average of 3.5 million tons of waste per year. This is carried by the tides throughout the floodplain.

*Chapter 2*  
**METHODOLOGY AND APPROACHES**

### **2.1 Framework of the Study**

Methodology describes the procedures to be followed for carrying out a research. It also explains the tools/methods to be used and how they will be used for collection and analysis of information relevant for the research work. This chapter deals with various steps (Framework of study tools, sampling design and procedure, sample size determination, data collection, processing and analysis) towards the completion of the research.

For proper interpreting, analysis and information generation on any subject, clear understanding on that subject matter is very much essential. The study mainly focused on the paradigm shift in farming systems as result of waterlogging. The farming system in Satkhira was basically crop based before waterlogging. But persistent waterlogging prevents the crop cultivation and crop lands gradually converted for aquaculture farm for shrimp and white fish culture. This change of crop based farming system to aquaculture based farming system negatively impacted the livelihoods of the landless and marginal farmers in the study area. The study attempted to assess the impact of cash based interventions carried out so far for recovery of livelihoods of the affected households through undertaking adaptive and alternative livelihoods options to cope with waterlogging. The study also focused on the changes occurred in the household economy (income and expenditure) of the households who received support from cash based interventions. The study focused to assess the changes in the following areas:

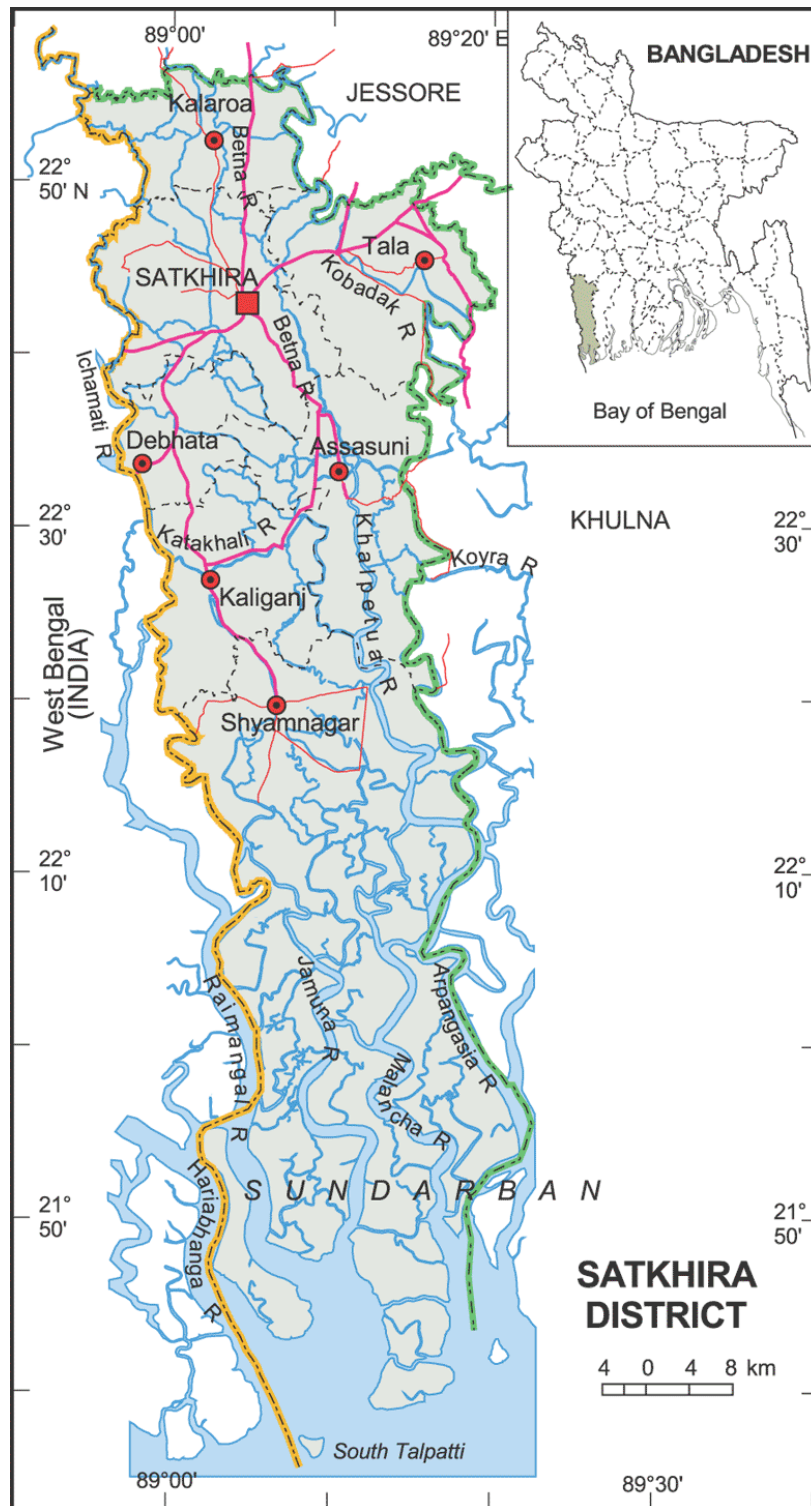
- Main livelihoods options of the landless and marginal farmers in the study area before waterlogging
- How the livelihoods affected by waterlogging?
- The coping strategies undertaken by the affected households
- Type of support received from different agencies (UN, INGOs, NGOs and Government etc.) for livelihoods recovery
- The changes in livelihoods options and impact of cash based interventions in undertaking adaptive and alternative livelihoods options
- Present status of household economy and food security

- Impact of cash based interventions in livelihoods recovery of the waterlogging affected households.

## **2.2 Study Area Selection**

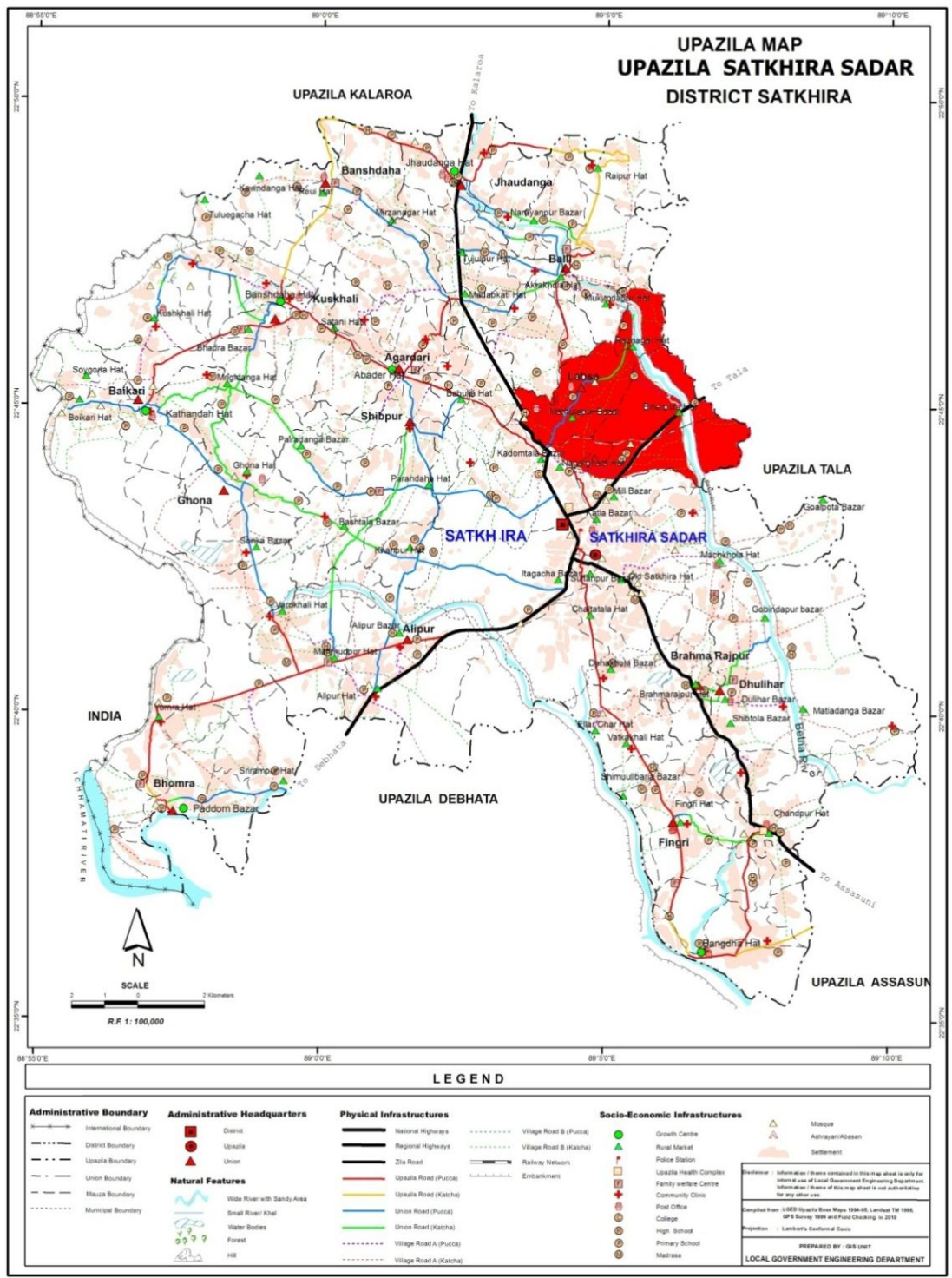
Before carrying out any kind of study, area selection, justification behind the selection of the area for study, detail information on the study area is very much important. Out of 3 waterlogging affected districts, Satkhira (Fig. 2.1) was selected for the study. Satkhira Sadar Upazila (Fig. 2.2) of Satkhira district has been purposively selected for following reasons -

- Satkhira Sadar is one of the most affected Upazila under waterlogging affected Upazila's under Satkhira district.
- Waterlogging has become a chronic phenomenon in the union and remains under water for more than 7 months in a year.
- Landless and marginal households completely lost their means of livelihoods
- Biggest Cash Based Intervention has been implemented in this union and highest number of households received cash support to meet immediate foods needs and recovery of livelihoods.
- Total BDT 188,216,000 was distributed among 12,012 households which is the single largest cash based intervention since 2012.
- Training and technical assistance were provided by the NGOs in collaboration with government department was provided to the households to undertake adaptive and alternative livelihoods option to cope with waterlogging.



**Fig. 2.1: Satkhira District Map**

In addition of that, Satkhira Sadar Upazila is located in the middle of the river Ichamoti and Betna. The Upazila has been affected by waterlogging since 2006 and with time the area affected by waterlogging has increased. In 2006, total waterlogged area was 9,046 ha which has gradually increased to 15,013 ha in 2009 and to 16,046 in 2013.

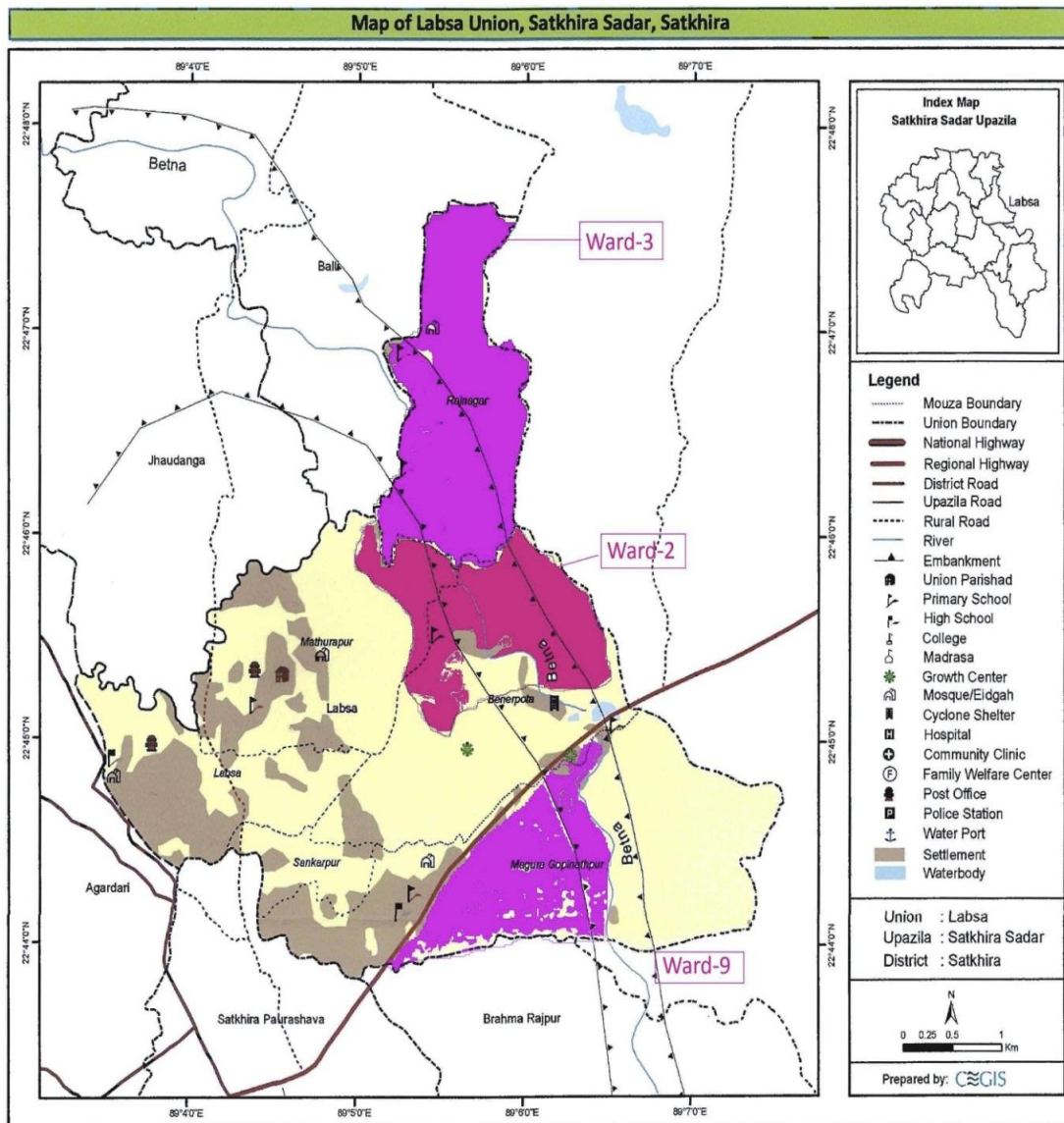


Source: LGED

Fig. 2.2: Map of Satkhira Sadar Upazila showing the location of the Study Union

Out of 16 unions in Satkhira Sadar Upazila, Labsa union was purposively selected for the study as it was one of the most affected unions and highest volume of cash was transferred among around 3500 waterlogging affected households.





**Fig. 2.3: Map of the study union (labsa) showing the wards selected for study**

Again, among the 9 wards, ward 2, 3 and 9 was purposively selected with consideration of severity of waterlogging and number of affected households (Fig. 2.3).

### 2.3 Respondent's Profile

Primary data was collected from 3 types of respondents. Household questionnaire survey was done through interview of the individual households from landless casual laborer group and small & marginal farming groups. Both of the groups received direct support from cash based interventions – CFW and LCG for livelihoods recovery. Data was collected from both male and female respondents. Participant of FGDs comprised of representatives from different occupational group and community

leaders from waterlogging affected area. FGDs were conducted with both female and male participants separately. Key informants were the local elected people's representatives, social elites and government officials.

Respondents of questionnaire survey were the landless day laborers, small and marginal farmers. They have very limited productive assets. Their assets comprised of small piece of homestead land (av. 4.9 decimal), small cultivable land (av. 9.64 decimal), 1 cow, 1 goat and 5 to 6 poultry birds. Landless day laborers mainly rely on casual day labor and do not have any secondary option for income. In pick season, daily wage rate for casual day labors is around BDT 350 which goes down to BDT 200 during lean season. Small and marginal farmers rely on crop cultivation in their own or leased land and wage labor. In their free time they sell labor to maintain family. Both of these groups are the main victim of waterlogging. Land less day laborers has lost employment and marginal farmers have lost production and income. As a result, they fall in chronic food insecurity and compelled to rely on detrimental coping strategies to cope with this adverse situation.

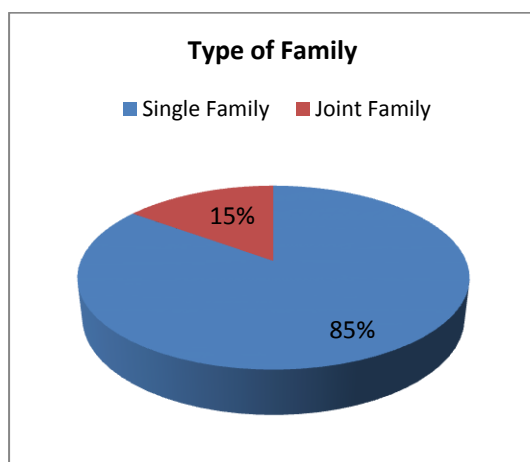


Fig. 2.4: Respondents age

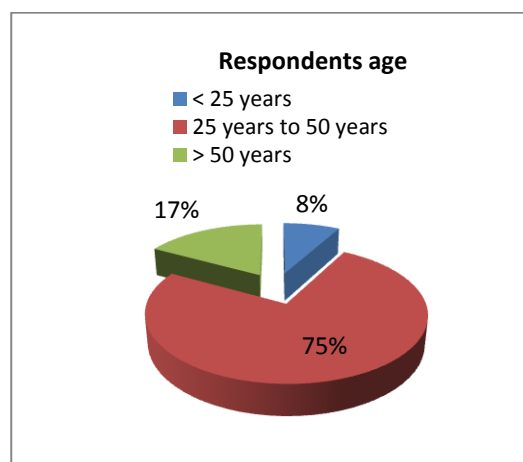


Fig. 2.5: Family type of the respondents

The respondents were from different age groups. Majority of the respondents (75%) were from the age group of 25 to 50 years. Only 17% respondents were more than 50 years old and only 8% were from the age of below 25 years (Fig. 2.4). Majority of the households (85%) were single family, only 15% households were joint family (Fig. 2.5).

## 2.4 Sampling Design

### 2.4.1 Sampling Procedures and Methods

The study area Satkhira Sadar Upazila has total 16 unions and out of the unions 6 are most of the affected by waterlogging. Affected unions are Labsa, Dhulihor, Jhaudanga, Fingri, Brammarajpur, and Balli. From 6 severely affected unions, Labsa union is purposively selected as this union was one of the severely affected unions and single biggest cash transfer program was implemented in this union since 2012. Out of 9 wards in Labsa union, ward no. 2, 3 and 9 was again purposively selected for the study considering the number of affected households and number of cash support recipients' for livelihoods recovery.

### 2.4.2 Sample Size Determination

Systematic random sampling (interval sampling) was used to select households to be interviewed for survey data collection. This sampling method was selected because ward wise list of the beneficiaries' households was available in all sampled wards. Hence, households could be easily located. To get the sample size following formula was used -

$$N = t^2 (p \times q) / d^2$$

Here,

N = is the sample size

t = is the error risk parameter related to the confidence interval (for a confidence interval of 5%, which corresponds to t = 1.96, is assumed)

p = is the expected prevalence (for a value of p = 0.2. is chosen, i.e. 20%)

q = 1 - p, i.e. q = 0.8

d = is the degree of accuracy required, generally 10%

According to the formula, the sample size was –

$$\begin{aligned} N &= 1.96^2 (0.2 \times 0.8) / (0.10)^2 \\ &= 61.46 \end{aligned}$$

Here N = 61.46 and the sample size was taken as 60

The study has covered 3 administrative wards and number of beneficiaries was almost same in each ward. So, total sample was evenly distributed in three wards. Hence in each ward, 20 sample beneficiary households were identified for questionnaire survey.

### **2.4.3 Sample Households Selection**

As prescribed in systematic sampling, the first household to be interviewed was chosen randomly (normally from first single digit numbers) using a table of random numbers (here from ward wise beneficiaries' household list). The following households were designated or nominated using the sampling step which was added to the previous number until the desired sample size is obtained.

The sampling step P depends on the size of the sample:

$$P = n/N$$

Here, n = total population, N = sample size.

$$\text{Here, } P = 1870/60$$

$$= 31.16$$

So, sampling step was considered as 30.

## **2.5 Data Collection Method**

Data collection from primary sources was carried out from 3<sup>rd</sup> week of February 2016 and it has completed within one week. Interview of the respondents started in 22<sup>nd</sup> February 2016 and completed in 28<sup>th</sup> February 2016. In addition, secondary data was collected from different sources such as government departments, UN agencies, INGOs and NGOs who have implemented cash based interventions in waterlogging affected areas. All the secondary information provided substantial information to support the findings from data analysis from primary sources.

### **2.5.1 Primary Data Collection**

#### ***2.5.1.1 Household Questionnaire Survey***

In order to conduct household survey, a semi-structured questionnaire was used for each of the individual households identified through sampling. Before going for real data collection, a field trial of the questionnaire was done to check if there is any change needed to best fit the questions in the local context and to get the desired information properly from the respondents. (Annex – 1)

#### ***2.5.1.2 Focus Group Discussions***

To capture some necessary qualitative information, 2 focus group discussions was conducted in the study area. One FGD was conducted with female groups and another one was with male groups from the selected study area. (Annex – 2)

### ***2.5.1.3 Key Informant Interview***

Interview with some key informants such as UP Chairmen, Government officials (Upazila Agriculture Officer, Upazila Livestock Officer) were done to capture some qualitative information and for triangulation of the information collected from individual households and focus group discussion.

### **2.5.2 Secondary Data Collection**

Some secondary data for this study was collected through detail reading and consulting the different books, study reports, project reports, already completed thesis papers, articles in new papers and relevant websites. In addition, necessary information was gathered from FSC, BWBD and LGED.

## **2.6 Data Processing, Cleaning and Analysis**

Collected data was entered and processed in a excel data sheet for analysis. Data from every individual respondent was cleaned by thorough check up and out of 60 data sets, 59 was found with full information for relevant analysis. Primary and secondary data was analyzed both quantitatively and qualitatively according to the nature of the data. Data table, graphs and charts (pie chart, bar chart etc.) was produced and presented in the study findings section.

*Chapter 3*  
**PROFILE OF THE STUDY AREA**

### **3.1 Characteristics of Waterlogged Area**

#### **3.1.1 Physical Settings**

The SWB falls under lower Ganges River Flood plain (AEZ 12) and Ganges Tidal Floodplain (AEZ 13). The region, belongs to coastal zone, the rivers in the Ganges Dependent Area (GDA) take off from Ganges River, flowing in the southwestern direction towards the sea. As the main distributor channels of the Ganges river moved eastwards, most of the rivers in the GDA slowly dried up, the process being accelerated by the upstream withdrawal (source: ICZM & WARPO, 2004). According to Brammer's description (1999), roughly 80% of the land in Bangladesh is made up of floodplains of various types. He also distinguished floods and waterlogging; the former one implies abnormal submergence of land causing loss of crops, properties and lives while the latter implies submergence of land by water, such as the floodplain inhabitants expect in normal years. The stagnant beels have become the off takes of the old distributaries. The moribund zone is a wider alluvial plain intersected by many non-perennial rivers and khals or marshes. Major rivers of the region are Bhairab and Kobadak, the tributaries of the main river Padma, Gorai, Kumar and their tributaries such as Naboganga and Chitra were the perennial rivers offering major drainage of the region. All rivers of the region originated from the river Ichhamoti which is a tributary of the river Padma and it enters Bangladesh near Meherpur. The rivers Naboganga, Chitra, Bhairab, Bhadra and Betna and one branch of Kumar are the tributaries of the Ichhamoti.

Government of Bangladesh undertook a massive program on polder construction in early sixties to protect the coastal areas from saline tidal flooding. A series of polder and sub-polders (139) were constructed by BWDB along the coast line with the idea that lands would eventually be free from soil salinity and a significant amount of arable land would be available for production of rice and winter season crops. Water control infrastructures developed in association with the embankments included sluice gates of various sizes and capacities. Operation and maintenance of these control structures was entrusted to the Operation & Maintenance division of the BWDB.

Rural road network has been a major development agenda during last couple of decades. This resulted in growth in the economy and improvement of life of the country. However, the massive road network involving bridges, culverts without always taking adequate account of drainage facilities added to the drainage congestion. Besides LGED, other local agencies are involved in roads, without coordination.

### 3.1.2 Topography

The region of SWB has a general slope from about 8m above sea level in the north-western part of Jessore to about 3.3m in the southern part of Satkhira close to the Bay of Bengal. The entire area is flat plain land with sporadic depressed areas scattered in the area locally known as “beel”.

**Table 3.1: Topography of waterlogged area**

Land Type	Area in Ha	Percentage
Highland	51,901	34
Medium highland	75,030	50
Medium lowland	23,473	16
Lowland	363	0
<b>Total</b>	<b>150,767</b>	<b>100</b>

*Source: FAO mapping exercise 2015*

Highland/lowland distinctions here are relative, and refer principally to how the land drains after rain. For instance, about 34% area of the region is highland - where rain water disperses within few hours of rainfall. Most of the infrastructures including homesteads are located in this area. The largest part (about 50%) of the region is medium highland which may be flooded up to 90 cm during monsoon. Accumulated rain water of this land type normally dries up by mid-late November.

### 3.1.3 Soil Resources

Soils of the region are formed by the alluvial deposition of the Ganges systems. Soils of the northern parts of Jessore, Khulna and Satkhira reached maturity and have

differentiated into horizons while those of the southern parts in close proximity to the Bay of Bengal are still young and have not yet been differentiated into horizons. Specific variations in the soil characteristics of the three districts are worth mentioning.

In Jessore, silty clay loam of the Ganges meander flood plain are found on the northern parts, calcareous dark clay loam of the old Ganges in the central part and dark grey clay mixed with peat is found in the northern part of the district. Moving south and eastwards towards Khulna, black brown peat is found in the sub-surface layers on the northern parts, dark grey clay of the old Ganges flood plain in the central parts and acid sulfate grey silty clay soils dominate the southern tidal flood plain. In Satkhira, saline Ganges tidal flood plain with silty loam to clay soils dominate in the northern parts and acid sulfate silty clay loam soils of the Ganges tidal flood plain are found in the southern parts. Peat soils in the sub-surface layers exist in western part of the district. Nevertheless, the soils of the region are highly valued for agricultural production. Most soils of the region are alkaline except some pockets where acid sulfate and peat soils exist; pH ranged from 4.1 to 8.9. Soil organic matter is very low in general, ranging from <1 to 1.32% except in peat where it reaches to about 19% (Brammer, 2013).

#### **3.1.4 Natural Resources Characteristics**

Soil and water salinity is a key characteristic and limiting factor in the coastal ecosystems. This plays a determining role in land use patterns. At least 30% of Bangladesh's arable land is in the coastal region and half of it remains either fallow or underused because of these coastal characteristics, particularly soil and water salinity. Levels of salinity vary throughout the year; it starts rising in the month of November and reaches a peak in March-April. This is caused by decreased flow in the river system which permits intrusion of salt water. Salinity then declines rapidly with the onset of monsoon rain. Over a typical year, soil salinity varies from 0.2 to 16 dS/m in Jessore and from 0.3 to 32 dS/m in the Khulna and Satkhira region. The saline front of the SWB coastal region over time is moving to the hinterland, making more normal agricultural land saline.

Soil organic matter (OM), a key indicator of soil fertility, is low in most of SWB in the pockets of peat soil. Data generated by SRDI indicate that the content of OM



varies from <1 to 2.5% in the normal agricultural land to as high as 19% in the peat soils of Khulna and Satkhira. Most plant macro- and micro-nutrients are abundant in the coastal soil, which as a result are relatively fertile although a wide spread deficiency of N, P, K and of some of the key micronutrients (Fe, Mn Zn) as reported by SRDI. Judicious application of N and P and liberal application of K can boost crop production in the region. Application of S and B should be avoided in the coastal soils, unlike other parts of the country beyond the coast.

### 3.1.5 Weather and Climate

#### 3.1.5.1 Temperature

Mean monthly temperatures do not vary significantly between the locations. Unlike other parts of the country, the coastal region in general experiences relatively higher night temperature during the winter months which is above the critical level ( $10^{\circ}\text{C}$ ) of plant growth. However, southwestern coastal region (Khulna) is hotter, particularly during the summer. The average day temperature during summer is more or less the same (around  $33^{\circ}\text{C}$ ) throughout the country. The hottest months are April and May, but the temperature seldom exceeds  $35^{\circ}\text{C}$  as is observed elsewhere in the country.

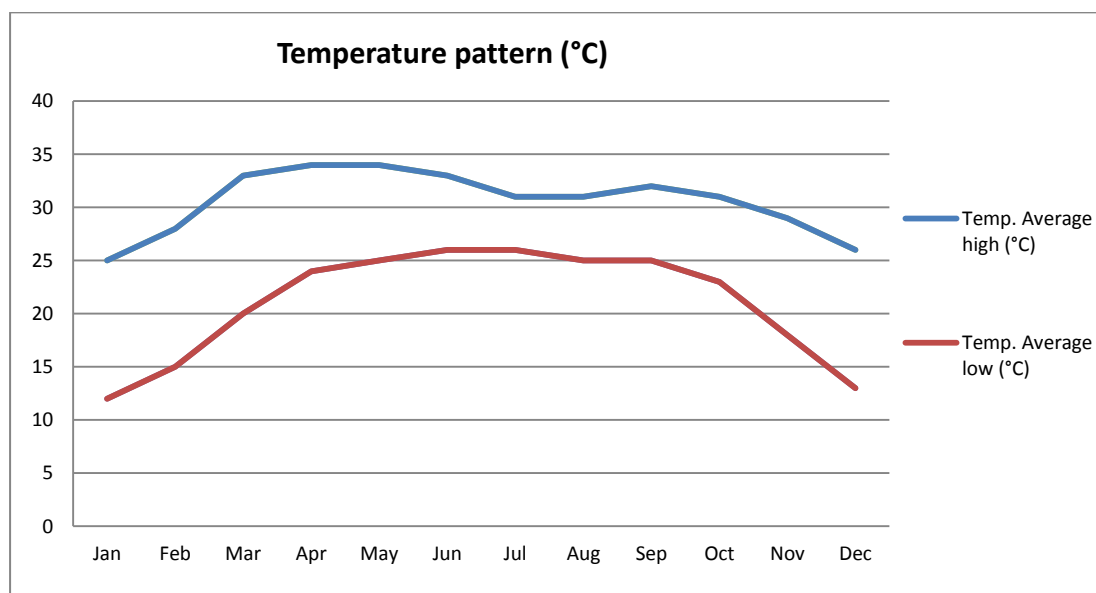


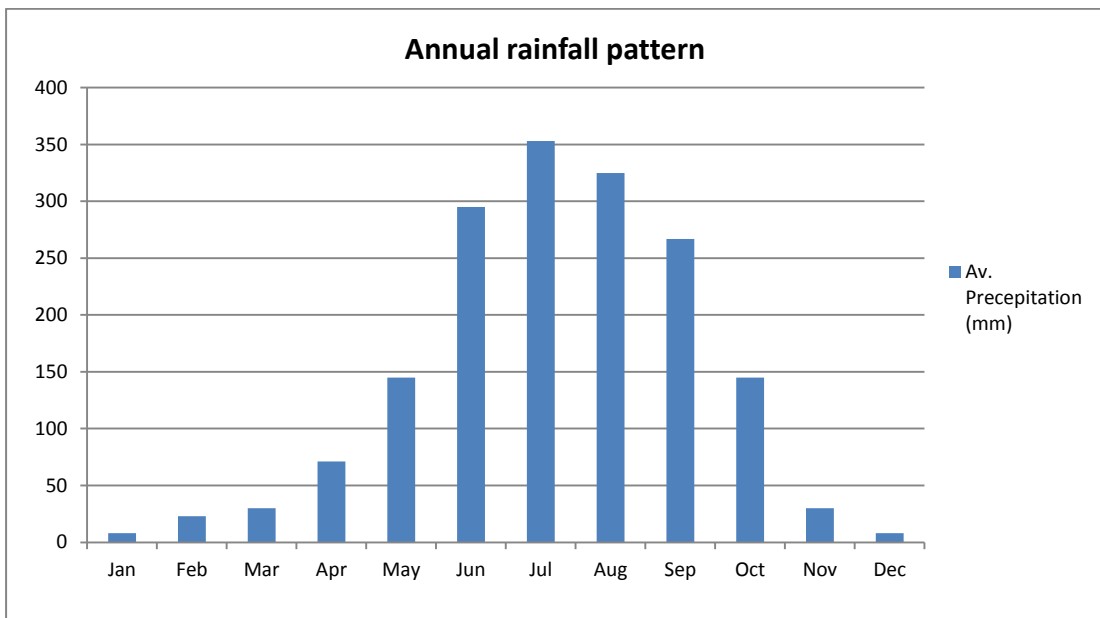
Fig. 3.1: Temperature Pattern (Source: BMD)

#### 3.1.5.2 Rainfall

Monthly total rainfall varies from zero in the months of December-January to slightly below 350 mm during monsoon (June-September) at Khulna. Cumulative annual rainfall at Khulna averaged over 1948 to 2011 is the lowest in SWB and never

exceeded 1800 mm. What seems to emerge from this rainfall data is that viewed over a 60 years' time frame there has been an increase in the proportion of late monsoon rain in the most recent twenty year period, when compared to previous time periods, particularly in the months of September and October. This slight shift in rainfall pattern – possibly falling onto already saturated land – is one explanation of the phenomenon of water logging compounded by drainage problems due to siltation and obstruction. Rainfall (total and October rain in mm) of last 14 years has been analyzed to find relation with water logging.

There seems less relation with October rain that shoots total rain in the starting years but in the latter part there seems influencing total rain. Also during 2010-2014 the rainfall induces water logging without considering the other hydrologic situations.



**Fig. 3.2: Rainfall Pattern (Source: BMD)**

### 3.1.6 Hydrology

Hydrology of the Southwest region of Bangladesh encompasses catchment areas of several major river systems. Water passes through the upper catchment area of Jessore and drain to the Bay of Bengal through river systems of Khulna and Satkhira. The main rivers passing through Jessore are Bhairab, Chitra, Betna, Ichhamoti, Kobadak and Harihar. Flows of these distributaries have reduced from the main river system, and some are 'dying' or silting up. For instance, the Betna originated from Bhairab at Chaugachha of Jessore, but at present there is no connectivity with the upstream river reaches and passes to Kolaroa of Satkhira through Sharsha upazila of Jessore. The Betna River is the peripheral river of Polder 6-8 and Polder 2 and at the downstream reach it is connected with Lower Kobadak River. The Marirchap River passes through Satkhira Sadar and there is a upstream connection with Betna River through Satkhira khal and the downstream reach is connected with Kholepetua River. The downstream stretch of Marirchap River is flowing east-westward and tidally active River where the upstream reaches is being silted up. The Parulia Sapmara khal is hydro-dynamically very important drainage system which is connected with Ichhamoti River at Bhatshala of Debhata Upazila and other end is connected with Marirchap River at Shalkhali but this system is experiencing severe siltation problem. The Parulia Sapmara River is also the peripheral river of Polder 1 and Polder 3-4. The Habra is the peripheral river of Polder 3 and Polder 4 whose upstream is connected with Parulia Sapmara River and finally meets with Kholpetua River at Kashimari. Kholpetua drains to Bay of Bengal through Shyamnagar upazila of Satkhira.

Bhairab River originates from Chaugachha of Jessore and passes through Jessore sadar, Bagharpara, and Abhaynagar upazillas of Jessore district, Fultala of Khulna and meets Atai River in Dighalia upazila of Khulna. Mukteswari (Teka)-Hari is an important river system which originated from Bhairab River near Jessore Airport and passes through Kotwali, Manirampur, Keshabpur of Jessore district and Dumuria of Khulna district then finally meets with Shibsra River through Teligati-Gengrail-Haborkhali river system. Atai river flows down to Khulna through Rupsha river near Baitaghata and takes name as Kazibachha and finally it drains directly to Bay of Bengal while the. The Lower Solmari River meets with Rupsa River latter through Pausur River. The Upper Bhairab river is branches into two namely Kobadak River and Bhairab River at Taherpur of Chaugachha upazilla of Jessore. The Kobadak River

is about 180 km long from Taherpur to Katakhalī of Paikgachh and meets with Hariā River which is finally connected with Shibsa River. The Kobadak is passes through Chaugachha, Jhikargachha, Manirampur, Keshabpur of Jessore and Tala of Satkhira and Paikgachha of Khulna districts.

Drainage of study area takes place through the above rivers along with their connecting channels and khals. The whole river system of the study area can be described under 11 catchment areas and after reviewing the past studies, the problems of the specific catchment and their probable mitigation measures have been suggested accordingly (by a local NGO, Uttaran), based on 11 catchment areas listed below.

1. Sholmari-Salta-Lower Bhadra system
2. Hamkura-Bhadra-Joykhali catchment system
3. Hari-Mukteswari catchment system
4. Upper Bhadra-Buri Bhadra- Hari catchment system
5. Teligati-Ghengrile catchment system
6. Salta-Gunakhali-Haria catchment system
7. Kapotakshi catchment system
8. Salikha catchment system
9. Betna catchment system
10. Marichap- Labonyabati catchment system
11. Shapmara-Goalgashia catchment

Many control structure in the drainage channels have become obsolete after changing the river course and or blocking the channel due to siltation.

### **3.1.7 Main Livelihoods Groups and Effect of Waterlogging**

Poverty incidence is already high in Satkhira district (55% compared to national average of 49% and costal average of 52%) and there is no doubt that 2011 water-logging hit the poor people most severely. The affected people were already vulnerable due to repeated water-logging over the last 10 years. Both household and local economies were not able to generate enough surpluses to recover from the cumulative impacts of past water-logging. The major livelihoods of the people are

dependent on natural resources and climatic conditions. In general, 60% HHs are dependent on agriculture. However, there is a major variation when it comes to the livelihoods of the poorest HHs. A sample longitudinal survey on employment status conducted by the DFID funded “Shiree” project indicates that 36% of the poorest HHs live on agricultural and other daily wage earning, 15% on small business, 7% on fishing and livestock and 10% on transport (like rickshaw pulling).

All of the households dependent on the agriculture are severely affected by the waterlogging as it changed the cropping pattern of the area and greatly narrowed down the scope of cultivation of major crops especially the amon paddy. However, most severe affected households are the marginal and land less farmers and daily wage earners who have lost the employment because of waterlogging.

The parts of the zone affected by waterlogging have varying degrees of inundation, both in terms of duration of inundation as well as height of the water. As elevation is the key determinant of inundation, those villages with large amounts of low lying land are the ones facing the most severe impacts. These villages are affected severely every year regardless of the rainfall situation. Other affected villages face moderate to severe levels of impact depending on the rainfall intensity. The rains of 2014 led to relatively low to moderate levels of inundation as compared with previous years. Tala Upazila has very high level of coverage of waterlogging, meaning there are very few non-affected villages. It is not an overstatement to say the direct impact of the waterlogging on livelihoods is massive. As can be seen in the seasonal calendar the multi-month presence of water in agricultural fields prevents basically all cultivation except for the boro rice crop. Cultivation of amon rice, vegetables, jute and mustard seed is minimal to zero in the affected villages. Mango production is very low in affected areas due to the death of trees (very high rate of tree death). Variations from year to year mean that sometimes some of these crops are cultivated in small amounts. For example, jute was being harvested in small amounts just before the timing of this research, however in the year before there was no production.

Other indirect impacts on livelihoods are the impact on education and marketing. Many schools in the affected areas are inundated (as seen on the cover on the report), and during peak flood periods roads and trading areas are covered. Many households need to make repairs to their homes after mud foundations have been inundated with

water for months on end. People seeking work need to travel further to find opportunities. There is an overall trend of increasing migration out of the area. Poorer households tend to migrate to neighboring districts and divisions to find seasonal work. Better off households tend to send someone abroad to countries such as Malaysia from where they are able to remit money home. These trends are noticeable at a broad level although they do vary from village to village. It is likely that people's ability to maintain a minimum level of hygiene and dignity related to bathing and defecating is much more challenging during waterlogging given they are surrounded by water.

On the other hand, there are positive opportunities that can be exploited with the new geographic realities. These mostly relate to aquaculture. Unfortunately for poorer households, the investment costs to engage in fish cultivation are prohibitive meaning that they are not currently able to utilize these opportunities to any great degree. Needless to say, people with financial capital, and political influence, are making the most of the opportunity. District-level Ministry of Livestock and Fisheries officials confirmed that the waterlogging has not led to any noticeable changes in livestock holdings in the area, aside from the normal seasonal variation that takes place. It is a common practice for households to purchase calves after the rains, fatten them for 6 to 8 months and then sell prior to the next monsoon season. Aside from these normal patterns there is no reported de-stocking. Throughout this report the term "affected area" refers to the parts of the zone that are repeatedly and significantly inundated with water. "Non-affected" refers to the parts of the zone that are not-affected by the waterlogging.

## **3.2 Cash Based Interventions**

### **3.2.1 Projects Description**

**Waterlogging Recovery Response:** Emergency response (food, hygiene kit, emergency shelter kits distribution) was done by the UN agencies, Government, International NGOs (INGOs) and national NGOs in 2011. Following the emergency response, different INGOs have implemented early recovery projects with support from European Community Humanitarian Aid Office (ECHO) in 2012. Cash based interventions such as Cash for Training (CFT), Cash for Work (CFW), Unconditional Cash Grant (UCG) and Livelihoods cash Grant (LCG) was the major component of the project.

**Early Recovery Response for Waterlogging:** The Project was implemented by 5 INGOs in collaboration with their Local partner NGOs. The project was financed by DFID and implemented under umbrella of WFP. The project started in April 2014 and completed in September 2014. Cash was transferred to the most vulnerable waterlogging affected household through CFW, UCG and LCG.

**Waterlogging Resilience Building Project:** The project is supported by ECHO and DFID and being implementing by WFP and two INGOs – Solidarites International and ACF. This project is also cash based which includes CFW, Conditional and unconditional cash grant for livelihoods recovery and implementation of small scale mitigation measures to reduce waterlogging risk in Satkhira district.

### 3.2.2 Total Coverage of the Cash Based Intervention

In Satkhira district 4 Upazila were identified as affected by waterlogging since 2011. These Upazila are – Satkhira Sadar, Tala, Assasuni and Debhata. Below table shows the area wise household coverage under cash transfer:

**Table 3.2: Coverage of Cash Based Intervention**

Upazila	Year wise coverage of households			Total
	2012	2014	2015	
Satkhira Sadar	3,750	4,462	3800	12,012
Tala	23,350	-	1766	25,116
Assasuni	2,000	-	1627	3,627
Debhata	2,600	-	-	2,600
Kaligonj	-	520	-	520
Shyamnagar	-	335	-	335
<b>Grand Total</b>				<b>44,210</b>

Source: INGOs project final reports

### 3.2.3 Total Amount of Cash Transferred So Far

Early recovery and recovery response initiatives started in Satkhira in 2012 following the emergency response in 2011. Cash transfer to the most vulnerable waterlogging affected households were the major components of all project interventions. Cash transfer aimed for recovery of food security and livelihoods and rehabilitation of the community infrastructures to reduce future waterlogging risk thus building a resilient community. According to the table total cash 465.93 million BDT was transferred in

Satkhira district among 44,210 households. That means each household received BDT 10,539 to meet immediate food security and recovery of livelihoods.

**Table 3.3: Total amount of cash transfer**

Upazila	Year wise cash transfer (BDT)			Total (BDT)
	2012	2014	2015	
Satkhira Sadar	22,500,000	80,316,000	85,400,000	188,216,000
Tala	140,100,000	-	65,342,000	205,442,000
Assasuni	12,000,000	-	29,286,000	41,286,000
Debhata	15,600,000	-	-	15,600,000
Kaligonj	-	9,360,000	-	9,360,000
Shyamnagar	-	6,030,000	-	6,030,000
<b>Grand Total</b>				<b>465,934,000</b>

Source: INGO project final report

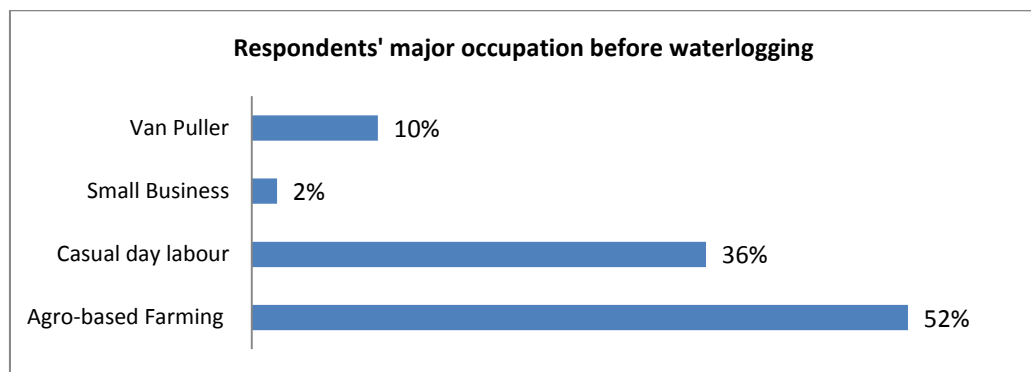


*Chapter 4*  
**CASH BASED INTERVENTIONS AND IMPACTS**

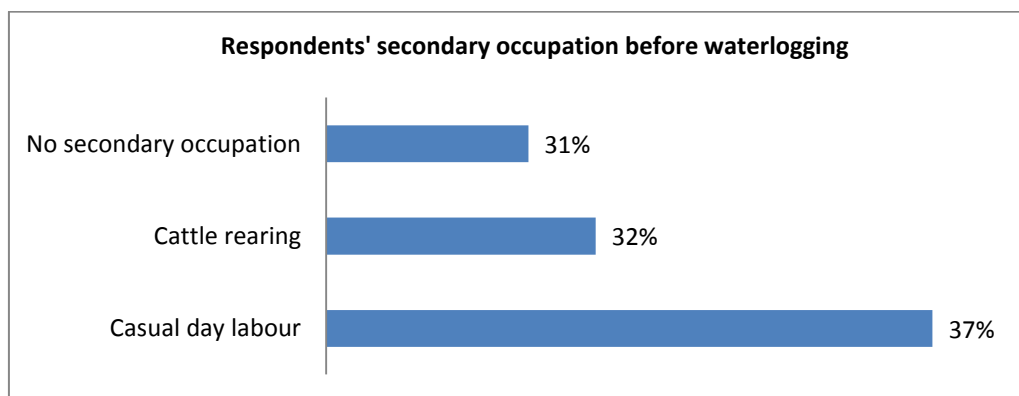
**4.1 Occupational Status**

**4.1.1 Occupations before Waterlogging**

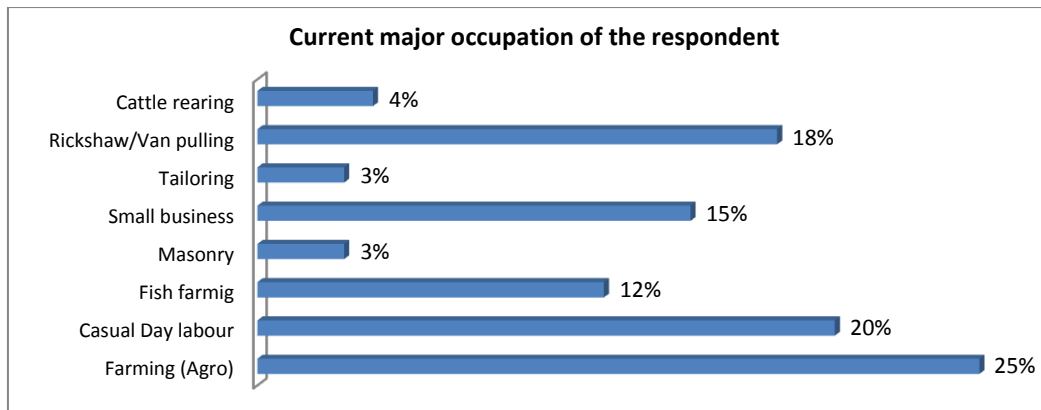
Major occupation of the respondents before waterlogging (2010) in this area were agricultural farming (52%) and casual wage labor (36%) (Fig. 4.1) 37% respondents mentioned casual wage labor as secondary occupation and 32% mentioned cattle rearing as secondary occupation (Fig. 4.2). However, 31% respondent mentioned that they had no secondary occupation before waterlogging. That means 69% of the respondents had alternative livelihoods options. These two groups were the main victim of waterlogging. They have lost production and income as crop production was not possible because of standing water in the cropland. Homestead based production (vegetable, fruits, poultry and livestock) that have good contribution in the monthly income of the poor households. But because of waterlogging homestead based production has completely collapsed for long period.



**Fig. 4.1: Major occupations before waterlogging**



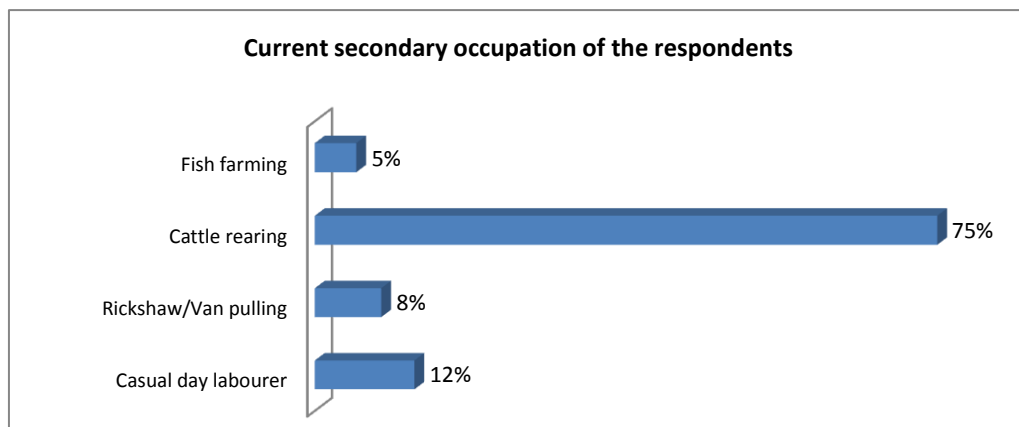
**Fig. 4.2: Secondary occupations before waterlogging**



**Fig. 4.3: Current Major Occupation of the respondents**

#### 4.1.2 Current Occupational Status

When asked about the current occupational status, respondents have mentioned a variety of occupational options. Main occupations are – agro-based farming, casual day labor, fish farming, masonry, small business, tailoring, rickshaw/van pulling and cattle rearing (Fig. 4.3). Beneficiaries have mentioned 4 options as secondary occupations (Fig. 4.4). All of the respondent households have at least one secondary option for income along with the main occupation. Out of 59 respondent households, 44% mentioned that they have more than 2 livelihoods options and 56% have two options of income generation. None of the households were relying on single livelihoods options.



**Fig. 4.4: Current Secondary Occupation of the respondents**

#### 4.1.3 Changes in Occupation after Waterlogging

A big change has occurred in the occupation of the waterlogged study area. Currently (2016) people in waterlogging area have been engaged in diversified occupations compared to occupational situation in 2010. There were 4 main occupations before waterlogging (2010) as mentioned by the FGD participants and individual household interview respondents. Out of 4 occupations, 2 were (agriculture farming and casual

day labor) most prominent occupation and 88% of the households were relying on these occupations. Two options were mentioned as secondary occupation and only 69% households were relying on 2 type of occupation. But it is noteworthy that both of the major occupation found very much fragile and severely affected by the waterlogging.

In contrast, 8 options were identified by the same FGD participants and household interview respondents as main occupation in 2016. Among them 5 options were found prominent and 90% of the households was engaged with these occupations. On the other hand, 4 options were identified as secondary options. In 2016, 100% of the households found having secondary occupations.

It is evident from the study findings that a big occupational diversity has been occurred among the waterlogging affected households. Number of occupation has been doubled and there is a dramatic change in type of occupations. Dependence on risky and unreliable options (agriculture-farming and casual day labor has reduced significantly (from 88% in 2010 to 45% in 2016). Reliance on new options such as small business, fish farming, masonry, tailoring and rickshaw/van pulling has increased. Dependency on casual day labor has decreased. It is also very much significant that 75% of the households have undertaken cattle rearing as secondary livelihoods options. Apparently, waterlogging affected households have been trying to undertake alternative and diversified livelihoods strategies to cope with changed context. They have been engaging in multiple type of livelihoods option rather relying on single livelihoods options. Out of 59 survey respondents, 44% now have 3 livelihoods options and 56% have 2 livelihoods options. None of the respondent households are relying on single livelihoods.

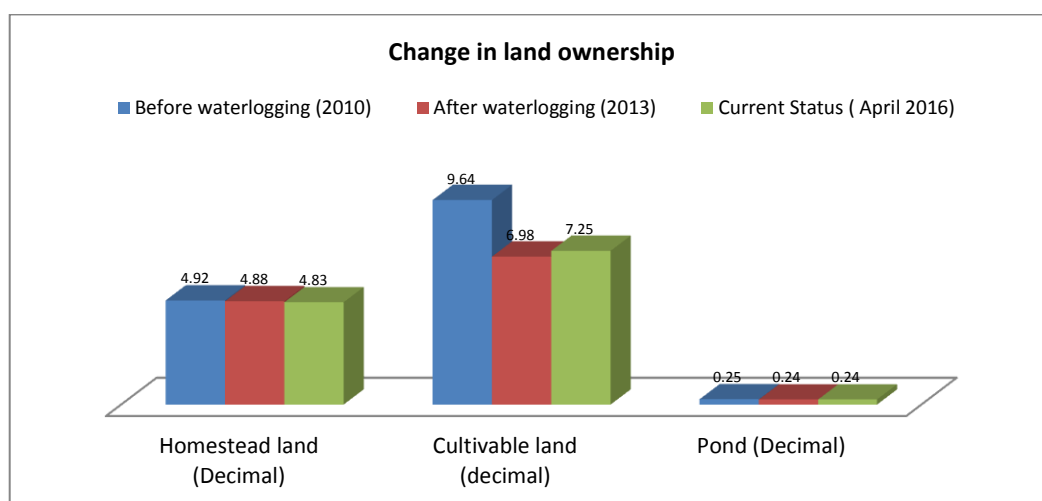
#### **4.2 Status of Household Assets**

Household assets owned by the study respondents comprised of land (both homestead and cultivable land), ponds, livestock, poultry, rickshaw/van, sewing machine, small shops/petty trade, bi-cycle, mobile phone, television and gold. These assets were categorized into 3 categories – a) agro-based productive asset, b) non-agro-based productive asset, and c) unproductive assets. Both of the household survey respondent and FGD participants mentioned about loss of assets due to waterlogging. Waterlogging affected people had to sell their productive and non-productive assets as

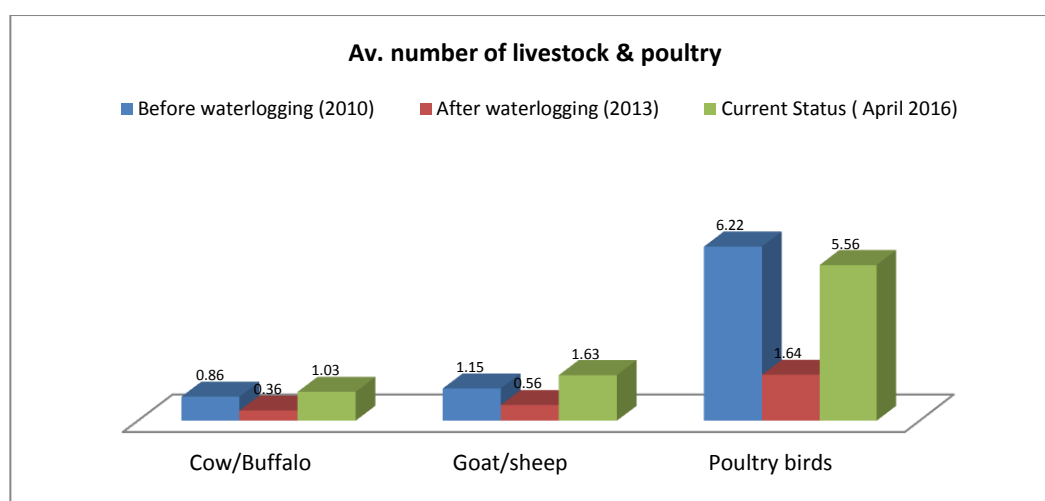
part of coping strategy against waterlogging. During waterlogging, 76% of the respondent households had to sell out assets. Only 24% households managed to cope with waterlogging without any type of asset selling.

#### 4.2.1 Status of Productive Assets

Landless day laborers have no or very limited productive assets except physical labor. Small and marginal farmers also have very limited resource base or productive assets. In general, productive assets of both groups are basically agro-based that comprised of lands (homestead and cultivable land), livestock and poultry birds. Few households have non-agro-based productive assets that comprised of small shop/petty trade (2%), sewing machine (1%) and rickshaw/van (24%). According to the study, waterlogging affected people basically lost productive assets like cultivable land, livestock (cow and goat/sheep) and poultry birds (duck, chicken).

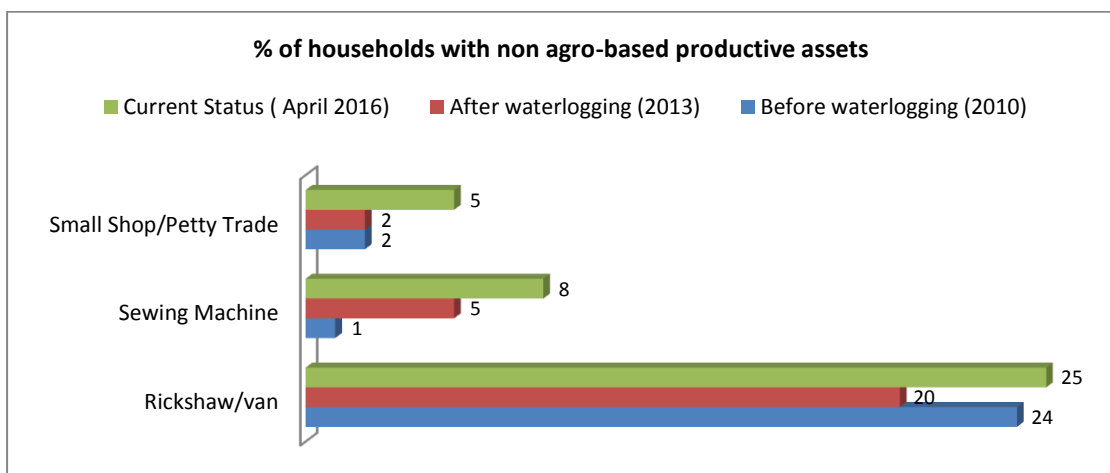


**Fig. 4.5: Changes in Land Ownership**



**Fig. 4.6: Av. Number of livestock & poultry per household**

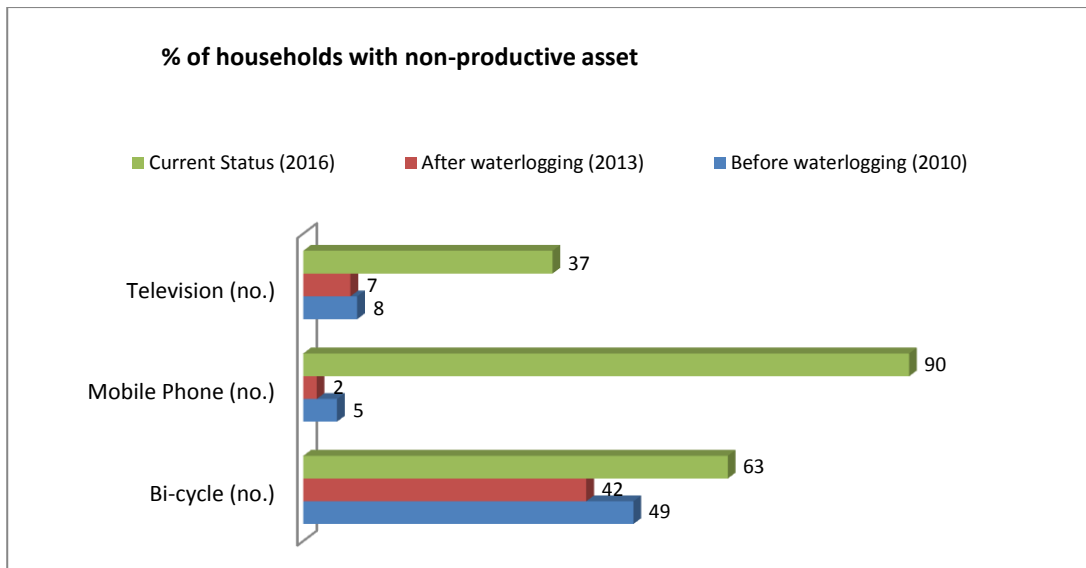
Due to waterlogging, respondent households lost in average 2 decimal of cultivable land and almost none of them managed to regain it. However, there was no changes occurred in ownership of homestead land and ponds (Fig. 4.5). Average number of livestock (Cow/goats/poultry) significantly reduced after the waterlogging and in most cases it was recovered in 2016. Average number of cow and goats/sheep has increased compared to the average number in 2010 (Fig. 4.6). Ownership of non-agro-based productive assets (petty trade/sewing machine/rickshaw van) has increased (Fig. 4.7) in comparison with the year of 2010 (before flooding). It is an indication of changes in livelihoods change.



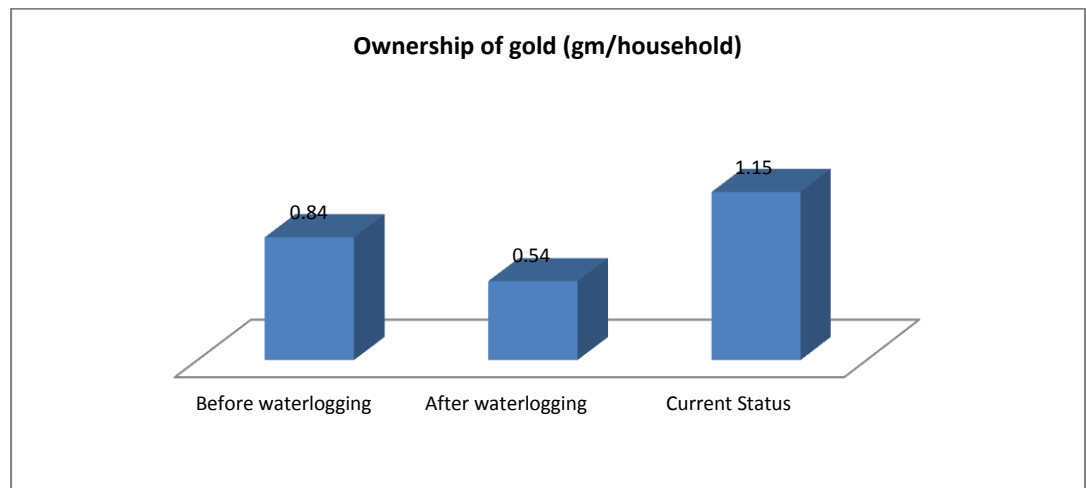
**Fig. 4.7: Percent of household with non-agro-based productive assets**

**Non-productive assets** comprised of bi-cycle, television, mobile phone and gold ornaments. Among the non-productive assets bi-cycle is common and 49% household possessed bi-cycle before waterlogging. Waterlogging affected people had lost non-productive assets also. Some household had to sell gold ornaments for survival.

Participants of the study are resource poor and they lost income production and employment opportunity for long period as waterlogging was a chronic phenomenon in the study area. They had to rely on negative coping strategy to meet the immediate needs including foods and other basic requirements.

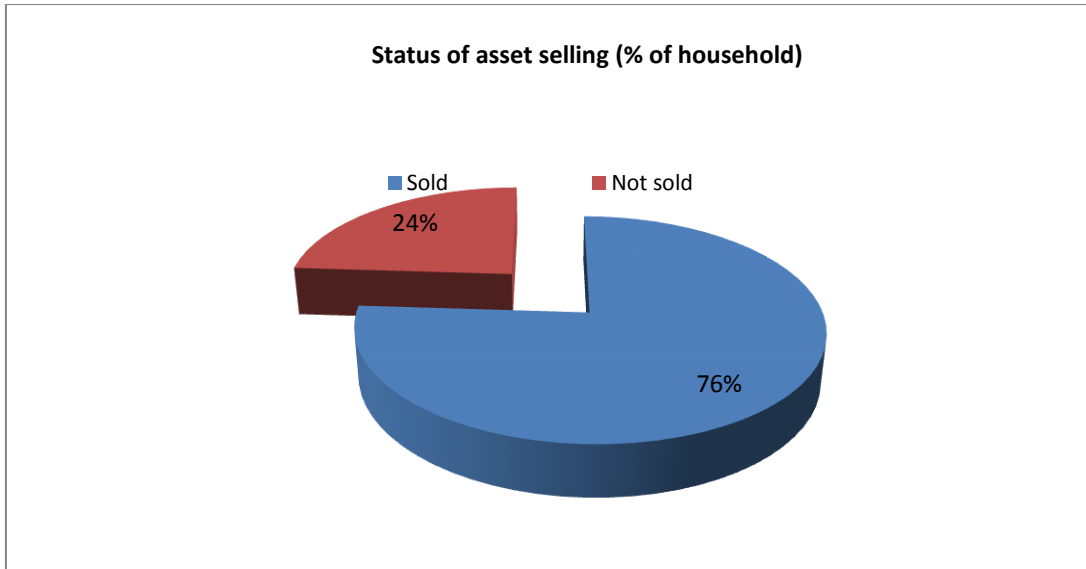


**Fig. 4.8: Percent of households with non-productive asset**

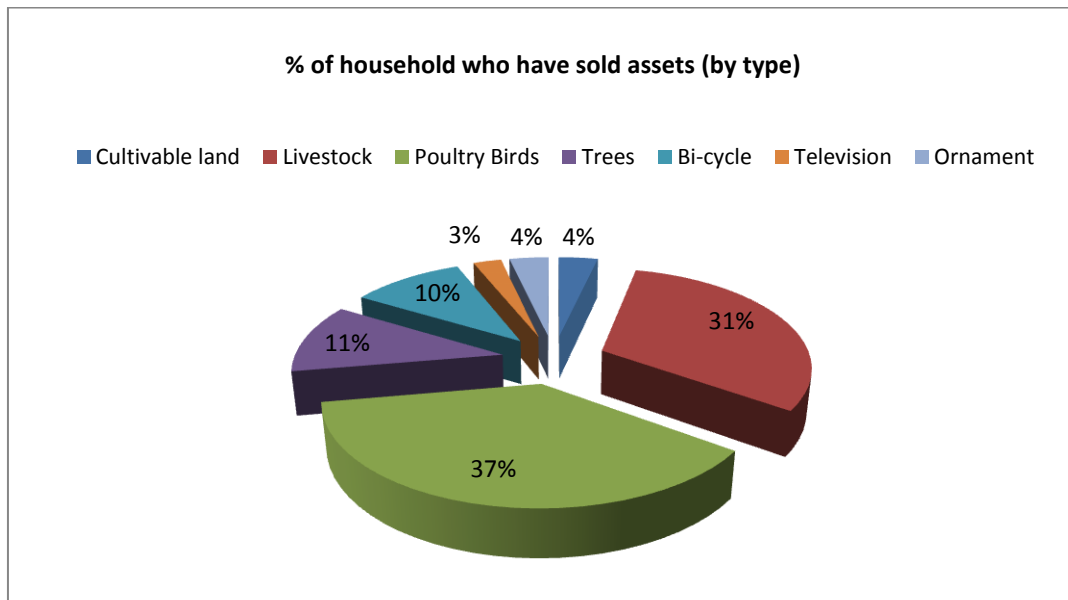


**Fig. 4.9: Ownership of gold (gm/household)**

There is a significant change in the ownership of non-productive assets by the study respondents in comparison with the status before waterlogging. Now 90% of the households have mobile phone whereas, it was the case for only 5% of the households. Ownership of television has increased by 29%. After waterlogging, 7% of the households had to sell bi-cycle but in 2016, ownership of bi-cycle has increased by 14% (Fig. 4.8). Ownership of gold decreased after waterlogging in. But in average ownership of gold increased by 0.31 gm/household in 2016 compared to the year 2010 (Fig. 4.9). Despite of selling assets to cope with waterlogging (Fig. 4.10 and Fig. 4.11), the waterlogging affected households managed to regain and to some extent increase the non-productive household assets. It is a clear indication of recovery of livelihoods.



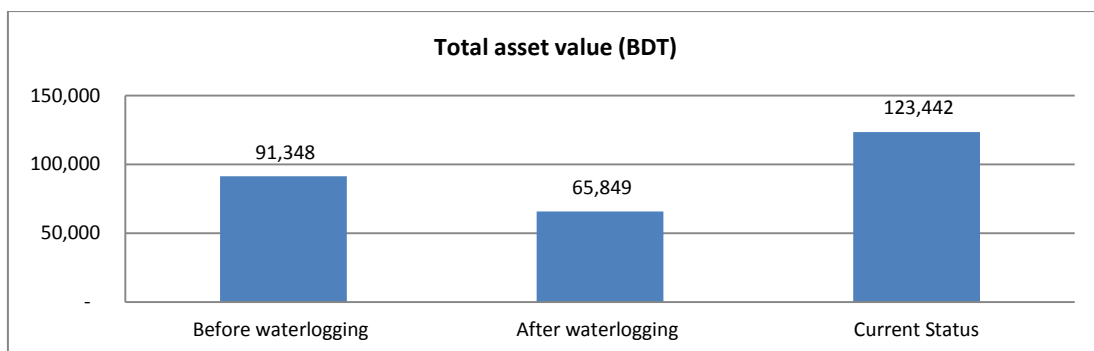
**Fig. 4.10: Status of asset selling (% of household)**



**Fig. 4.11 Percent of household who have sold assets (by type)**

#### 4.2.2 Status of Total Asset Value

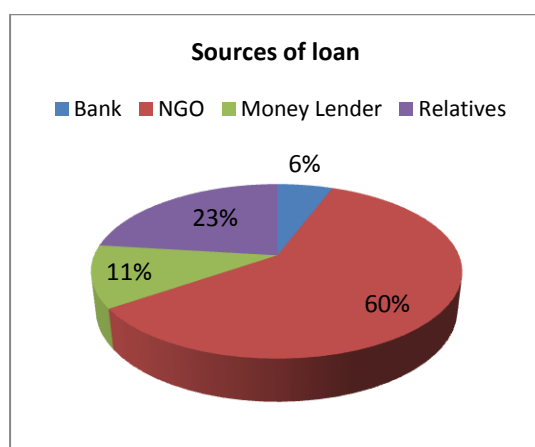
The study found changed in value of total assets owned by each households before waterlogging (in 2010) after waterlogging (2013). Value of total assets declined due to sell out of assets as part of negative coping strategies by the households. However, according to the household survey data asset value has increased again and surpassed total asset value of before waterlogging (Fig. 4.12).



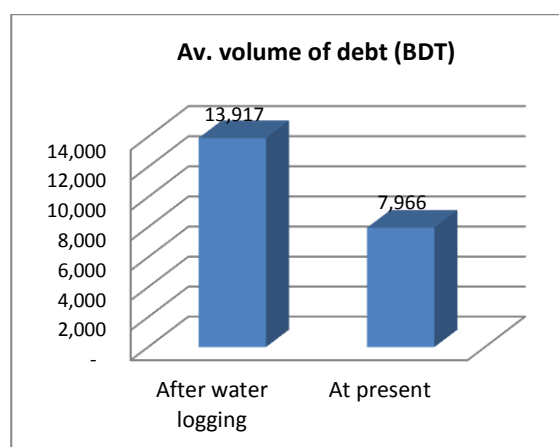
**Fig. 4.12 Value of total asset of household**

### 4.3 Burden of Debt

Out of the total respondents, 88% took loan from different sources. Main sources were national and local NGOs (60%). Other sources were banks (6%), local money lenders (11%) and relatives (23%) [Fig. 4.13]. At the end of 2013, average loan amount per household was BDT 13,917. According to the respondents and FGD participants, loan money was utilized for meeting the need of food and other basic requirements and investment in income generating activities. However, during the study average loan amount per households was reduced to BDT 7,966 (Fig. 4.14).



**Fig. 4.13 Source of loan**



**Fig. 4.14 Average debts per households**

### 4.4 Overall Impact of Waterlogging on Livelihoods

Waterlogging was very much devastating for the affected community and had very negative impact on their livelihoods. According to the FGD participants and individual respondents impacts of waterlogging were –

- Damage of crop, vegetable and fisheries.
- Crop and vegetable cultivation shrunk dramatically as crop land was inundated by water for long time (more than 6 months).



- Loss of production - mainly crop, vegetable and fruits.
- Ponds overflowed and loss of pond fishes.
- Employment opportunity for casual day laborers reduced (6 to 10 days per month).
- There was no work for women laborers during lean season.
- Monthly income reduced drastically (BDT 1500 to BDT 2000 per month).
- Wage rate for daily laborers reduced.
- Loss of assets productive assets which constraints future livelihoods.
- Selling out of living assets (cow, goat/sheep, ducks and chicken) in low price.
- Homesteads inundated by water, fruit trees died, no place for vegetable production, no place to keep poultry and livestock.
- Lack of fodder for livestock, milk production reduced.
- Infrastructuredamage – connecting roads, embankments, school ground, markets etc.
- Damage of shelters.
- Damage of sanitary latrines.
- Disruption of local transportation and communication
- Diseases of poultry and livestock.
- Water stagnation for long time, pond water quality deteriorated.
- Increase of skin diseases.
- Seasonal migration by the male members to find work.
- Insecurity especially for adolescent girls and women due to temporary migration of the male members

#### **4.5 Coping with Waterlogging**

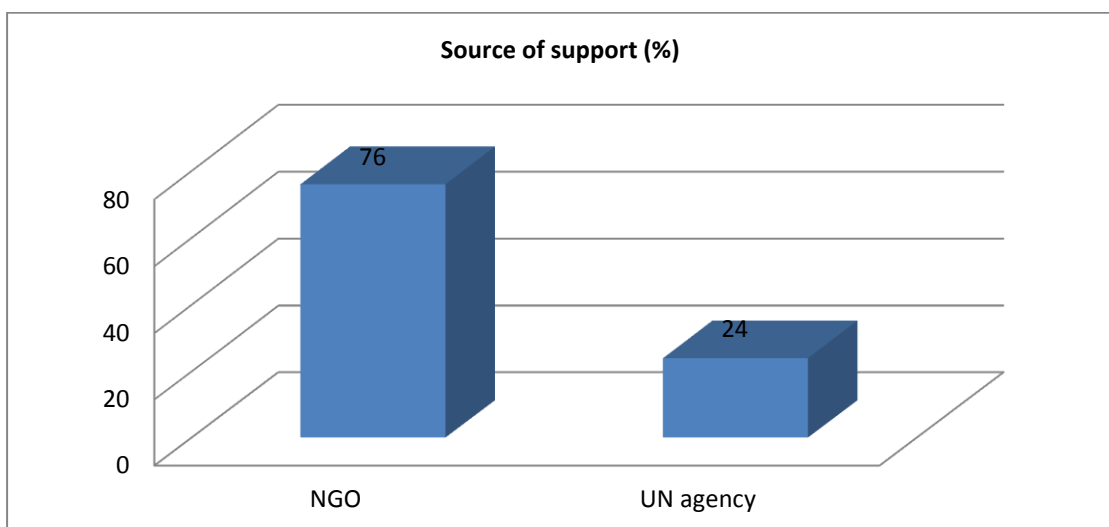
FGD participants and study participants mentioned following strategies adopted by the affected people to cope with waterlogging –

- Distress selling of the productive assets.
- Doing low paid work or work in low wage rate.
- Change of livelihoods – catching fish in river (men), working as house worker (female) in nearby houses.
- Temporary migration to town area or other districts for work.
- Engaging school going children in work such as domestic worker in nearby town.
- Reduced number of meal and reduce of meal size.

- Eating less preferred/nutritious food.
- Borrowing money from relatives.
- Loan from NGOs and money lenders with high interest rate.

#### 4.6 Support Received from Different Agencies

To reduce the sufferings of the waterlogging affected community different agencies such as international NGOs and national NGOs and UN agencies with support from donors (ECHO and DFID) has implemented early recovery and recovery projects in the study area. These were basically cash based interventions to transfer cash to the most vulnerable affected households to meet immediate needs for foods and other basic requirements and restart of the livelihoods. Cash was transferred to the beneficiaries as both conditional and unconditional cash grant. Conditional cash transfer was through Cash for Work (CFW), Livelihoods Cash Grant (LCG). Damaged community infrastructures were rehabilitated through CFW to make them functional to provide physical protection of the livelihoods. Livelihoods cash grant aimed to enable the most vulnerable household to restart the livelihoods. More importantly, this support aimed to build capacity of the project beneficiaries to build resilience against waterlogging through adaptive and diversified livelihoods options. They received training and technical assistance from implementing NGOs and respective government departments. So far, participants of the study have received BDT 23,619 in average from different projects implemented by INGOs and UN agencies. Out of the total cash 76% received through International NGOs and 24% through UN agencies such as WFP, FAO and UNDP (Fig. 4. 15).



**Fig. 4.15: Sources of Cash support**

#### 4.7 Type of Investment by the Beneficiaries

Cash recipients have invested the cash in different alternative livelihoods options. These are – cattle and poultry rearing, land leasing and fish farming, sewing machine, rickshaw/van procurement and small business. Fig.4.16 shows the status of investment in different livelihoods options.

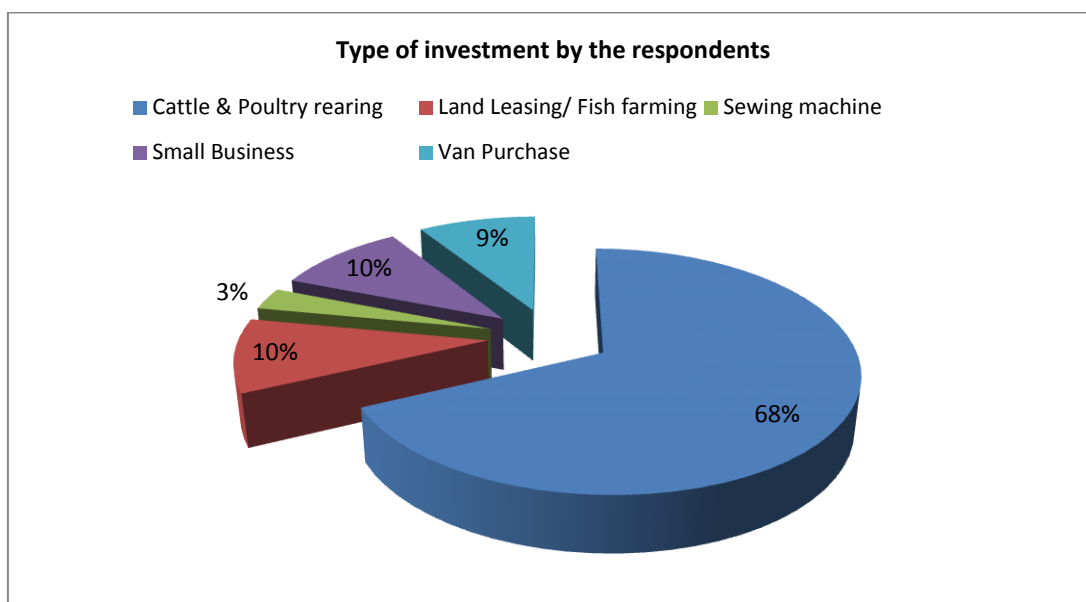
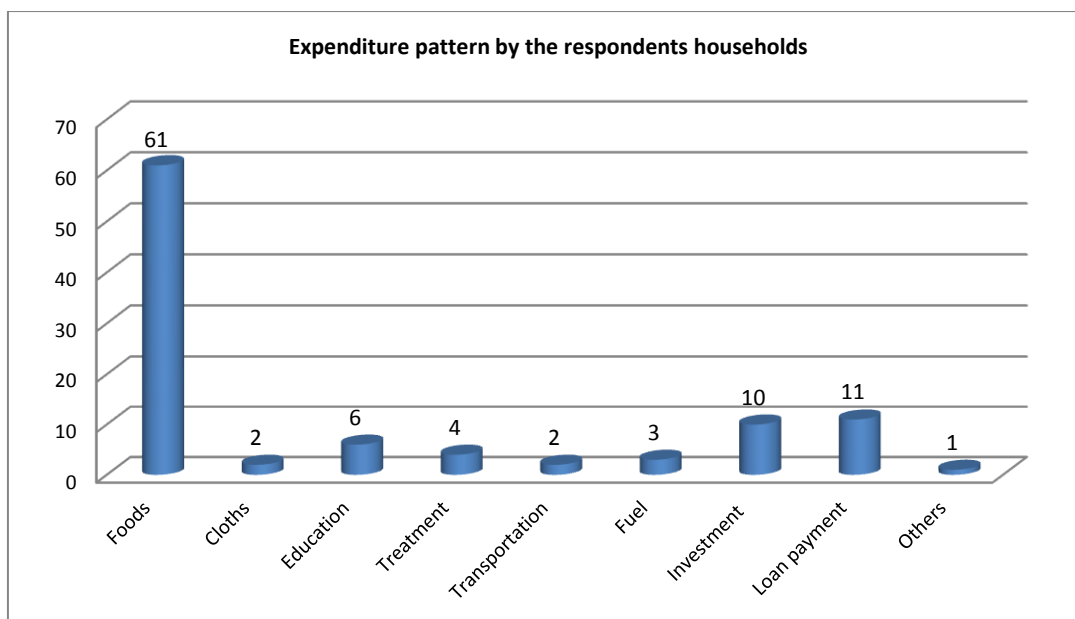


Fig. 4.16: Type of investment by the respondents

#### 4.8 Monthly Income and Expenditure of the Households

Study participant were asked to recall their monthly income before waterlogging (in 2010). During that time the daily wage was BDT 200 and day laborers managed to get work for 20 days per month. Hence, average income for casual day laborers was BDT 4000. Monthly income of marginal farmers was around BDT 6000 per month. During the waterlogging period, income of both occupational group reduced by BDT 1500 to 2000 as mentioned by the FGD respondents. According to the study respondent, the current monthly average income is BDT 6781 per month. Respondents were asked to recall the current monthly expenditure. The average expenditure is found BDT 5102 per month. That means beneficiaries household now can earn more money than the expenditure and able to do some savings. But it is still a concern that expenditure on food is account for lion portion (61%) of the total expenditure. Expenditure in productive assets or longer term investment such as education is still very low. Repayment of loan also accounts for 11% of the total expenditure. Fig. 4.17 shows the pattern of monthly expenditure of the respondent's households.



**Fig. 4.17: Expenditure patterns of the respondent households**

#### 4.9 Food Security Situation

To know the current food security situation of the study participant's household food consumption data was captured to get the Food Consumption Score (FCS). Food consumption score is a proxy indicator of household food security. World Food Program defined following threshold for poor, borderline and acceptable food consumption score. Households with acceptable food consumption score (> 42) is considered as food secured.

**Table 4.1 Food Consumption Score**

Food Consumption Score	Thresholds
Poor	$\leq 28$
Borderline	28.5 to 42
Acceptable	$>42$

Source: WFP

According to the above threshold, 58% of the respondents have the acceptable food consumption score. Food security is an issue for 42% of the respondent household with borderline FCS.

#### 4.10 Community Perception on Future Risk of Waterlogging

One of the objectives of cash based interventions was to reduce the future risk of waterlogging. Rehabilitation and reconstruction of community infrastructures (roads, embankments, canals, culverts etc.) were done through cash for work program to make the infrastructures functional for protection of livelihoods. The study aimed to have community perception on future risk of waterlogging for vital community infrastructures and important livelihoods components. Level of risks was categorized into 4 categories – no risk, low risk, moderate risk and high risk. Fig. 4.18 depicts how community perceives the future risk of waterlogging in the study area.

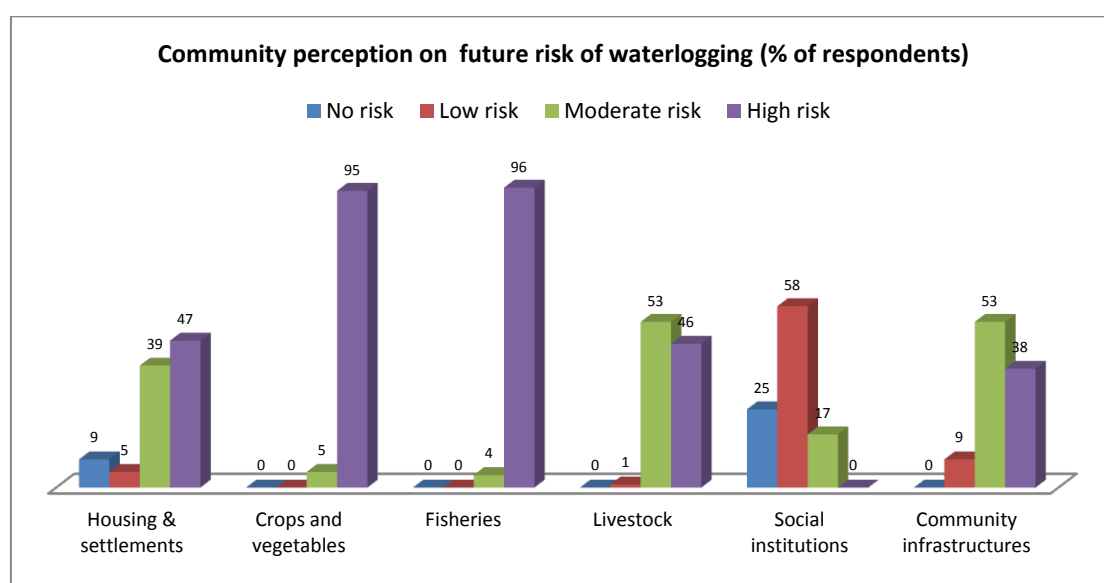


Fig. 4.18: Community perceptions on future risk of waterlogging

#### 4.11 Impact of Cash Based Interventions on Livelihoods

Since 2012, several Cash Based Interventions (CBIs) were carried out in waterlogging affected areas by national and international NGOs, UN agencies. CBIs comprised of both conditional and unconditional cash grant such as UCG, CFW and LCG. These interventions had 3 major objectives. The objectives were - i) cash transfer to the most vulnerable waterlogging affected households to meet immediate need of food and other basic requirements, ii) rehabilitation and reconstruction of damaged community infrastructure through CFW to reduce future waterlogging risk, iii) recovery of livelihoods of the most affected households. A substantial volume of cash was transferred to the project beneficiaries in last 4 years (from 2012 to 2015). LCG was provided to the project beneficiaries for recovery of livelihoods and build resilience through undertaking alternative and diversified livelihoods. The study intended to see

the impact of these CBIs in recovery of livelihoods of most vulnerable affected households that was lost due to persistent waterlogging. The study defined 7 parameters to understand or measure if the project beneficiaries managed to recover the livelihoods they lost due to waterlogging and if the current livelihoods strategies undertaken by the beneficiaries resilient or not. Parameters are -

**1. Changes in occupation and livelihoods strategies:** FGD participants and household interview respondents mentioned 4 type of occupation as main occupation in 2010 (before waterlogging). Out of the main occupation, agriculture farming and casual wage labor was the dominant occupation (84% of the respondents). It is noteworthy that, both of the occupations were found very much fragile and most affected by waterlogging. Out of 2 secondary occupations, casual wage labor was common.

In 2016, number of main occupation was 8 as mentioned by the respondents. Number of secondary occupation was 4. Agriculture farming as main occupation has reduced from 52% to 25% of the respondents households. Similarly, casual wage labor as main occupation also reduced. Waterlogging affected households tried to shift from traditional occupations like agriculture farming and casual day labors to new occupation and livelihoods strategies.

**2. Adoption of alternative and diversified livelihoods options:** Before waterlogging (in 2010), main livelihoods options were limited to agriculture farming and casual wage labor. Both of the options were severely disrupted by waterlogging. As a result, project beneficiaries households tried to find new livelihoods options. From more risky options they tried to shift for less risky options. Livelihoods cash grant enabled them to adopt alternative and multiple livelihoods option in combination of on-farm and off-farm. Study findings say that all of the respondent households now have at least 2 livelihoods options. Out of 59 respondent household, 44% now have 3 livelihoods options. It is a clear indication of recovery of livelihoods and enhanced resilience against waterlogging.

**3. Recuperation of household assets:** Households assets of study participants comprised of land (homestead and cultivable land), cows, goat/sheep, poultry, rickshaw van, small shop, television, mobile phone, bi-cycle and gold ornaments. To cope with waterlogging almost all have sold living assets. Some have sold cultivable

land, bi-cycle, rickshaw van, gold etc. However, study findings say that the households managed to regain the productive assets except cultivable land. Number of cows and goats exceeds the number before waterlogging. Number of non-agro-based productive assets increased significantly. At present, 90% of the respondents have mobile phone, 63% have bi-cycle and 37% households have television.

**4. Increase of total asset value:** The study captured information on the total assets (both productive and non-productive) owned by the study participants and total value of assets. Before waterlogging (in 2010) total value of asset was BDT 91, 348. Total value of asset has reduced to BDT 65,849 after waterlogging in 2013 because of sell out of assets. However, total value of assets stood at BDT 123, 442 in 2016 and surpassed the asset value of the 2010 by BDT 32,094.

**5. Reduced burden of debt:** The waterlogging affected households took loans from banks and NGOs and also borrowed money from money lenders and relatives. In average, each household had loan amounting BDT 13, 917 in 2013. However, in the April 2016, loan amount per household has reduced to BDT 7,966. That means the households have achieved the ability of repaying the previous loan and trying to release the burden of loan. This is a clear indication of gradual recovery of livelihoods by the waterlogging affected households.

**6. Increased monthly income:** All of the respondents households managed have to alternative and diversified livelihoods options with the support from the LCG. Out of 59 study participant household, 44% have more than 2 options and 56% have at least 2 options. None of the households are relying on only casual wage labor. As a result their monthly income has increased. Before waterlogging the average income was around BDT 4000, whereas their current monthly income is around BDT 6800.

**7. Improvement of community infrastructures:** Community infrastructures such as canals, roads, culverts, embankments, school grounds and markets were damaged because of persistent waterlogging. Cash for work was implemented by the NGOs and UN agencies for cash transfer to the most vulnerable households as well as rehabilitation/reconstruction of the infrastructures. Aim of this intervention was to make the community infrastructures functional. Through CFW, canals were re-excavated and linked with rivers to ensure proper drainage of rain or flood water to reduce water logging. Roads were reconstructed and repaired maintaining the height

above the highest flood level to ensure mobility of the community people during rainy season. Required number of culverts was installed for smooth water flow. Damaged embankments were repaired to protect field crops from flood water. Markets, school grounds were raised to make these institutions functional during rainy season. Out of 59 study participants, 98% think that canals are now functional, 71% think that condition of roads improved. However, still waterlogging risk is big concern for the study respondents. They perceive that crops, vegetables, fisheries, housing and settlements, social institution and community infrastructures are still under moderate to high risk of waterlogging.



## *Chapter 5*

### **CONCLUSION AND RECOMENDATIONS**

#### **5.1 Conclusion**

Chronic waterlogging problem in south-west region of Bangladesh has severely disrupted the livelihoods of the people. Low income group such as landless day laborers, small and marginal farmers were the most affected group. They have lost livelihoods and fall in chronic food insecurity. Negative coping strategies such as selling productive assets, temporary migration for work, reduced meal in both quality and quantity etc. by the affected community was reported in different need assessment and survey reports. These types of coping strategies have longer term negative impact on future livelihoods and productivity. Cash based interventions intended to protect the most vulnerable community form relying negative coping strategies and to address the immediate and chronic food insecurity through providing cash income to the affected community. Livelihoods cash grant was provided for livelihoods recovery through alternative and diversified livelihoods options.

It is evident from different project report and study findings that CBIs have played very vital role in addressing the immediate food security need and recovery of livelihoods of the most vulnerable affected people. The rehabilitated or reconstructed community infrastructures contributed greatly in reducing the future risk of waterlogging and for protection of livelihoods. LCG helped them to regain the productive assets and to diversify the livelihoods strategies to make the livelihoods more resilient against waterlogging. To some extent, some of the beneficiaries managed to increase the asset level more than the asset they had in 2010. Training and technical assistance followed by the cash grant was very much useful for the beneficiaries to find alternative livelihoods options. Most of the project beneficiaries who were relying on single and unreliable income generating activities, now managed to have diversified source of income. They managed to reduce the burden of debt. Their access to public and private services has increased. Their monthly income increased and most cases surpassed the monthly expenditure. As a result, now they have ability to save money for future investment and strengthening the livelihoods. According to the FGD participants, many of the beneficiaries now have access to bank services through mobile bank account. In general, CBIs has contributed in major 3 areas as below -

- Through the construction and repairing of priority community assets, CBI has built physical and environmental resilience of targeted poor households to disaster related shocks and threats.
- It is anticipated that the establishment of income-generating activities, and subsequent reinvestment and diversification, would lead to sustained improvements in the economic resilience of the targeted women and their households in the longer term.
- Cash Based Intervention (CBI) accompanied with training and technical assistance showed very positive result in promoting sustainable livelihoods for the most vulnerable household.

Hence, it can be concluded that, CBIs had a great contribution in recovery of livelihoods of the poor people affected by waterlogging. It also helped them to diversify their livelihoods with alternative options to be more resilient against waterlogging.

## **5.2 Recommendations**

CBI is new in Bangladesh though almost all humanitarian actors currently find it very effective and useful in early recovery or recovery interventions after any disaster. Almost all of the early recovery and recovery projects implemented by INGOs and UN agencies since 2013 relied on CBIs. Effective and well-functioning market system was the main driver for choosing cash based interventions in humanitarian response. Less human resource requirement, cost effectiveness and less complexity in operation, security etc. was the other drivers behind the cash transfer initiatives. In addition, CBIs became very popular to the project participants as it gave them freedom of expenditure to them according to their needs and choices. Above all, CBIs found very helpful in enhancing local economy. However, after action lessons learning workshops identified some challenges related to cash transfer in CBIs. CBIs will become more efficient and effective if initiatives can be taken to overcome these challenges. In order to overcome these challenges, the study proposes following recommendations:

1. There is no standardized cash package for monthly requirement to meet the immediate needs of food and other basic requirements after the disaster to protect them from negative coping strategies. Similarly, there is no standardized cash package developed by humanitarian actors needed for

recovery of livelihoods of landless, small and marginal peasant households. As a result there is lack of harmonization in cash transfer program and amount of cash allocated by the agencies very often found insufficient for full recovery of livelihoods and achieving resilience against flood and waterlogging. A standardized and harmonized cash package for livelihoods recovery is needed.

2. Because climate change affects rainfall pattern, temperature, timing of flooding, frequency and intensity of disaster event have changed and become unpredictable. As a result traditional knowledge is not working. So only cash transfer will not give expected result. To enhance resilience against disaster, affected people need expert knowledge and improved and adaptive technology is required. So cash transfer must be accompanied with relevant hand on training and technical assistance.
3. There is lack of proven adaptive and alternative production techniques for better coping with waterlogging. Applied research in collaboration with Universities, Research Institutions and relevant government departments are very much important. National and International NGOs, UN agencies must keep provision for applied research during designing any project.
4. All most all of the cash transfer project found short term, only for few months (6 to 12 months). With this short timeframe, capacity building through practical trainings, introduction of new and innovative production techniques, necessary follow-up and monitoring is not possible. As a result project beneficiaries may not achieve expected results. So longer term project is needed instead of shorter term project.
5. Most of the project participants are unbanked as they do not have access to traditional banks. Many humanitarian organizations introduced mobile cash transfer through opening a bank account in the name of the beneficiaries. They have provided only SIM cards. The objective of this mobile bank account is ensuring access of the beneficiaries in banking service to do cash transaction and savings. Most of the beneficiaries do not have handset they have to rely on the relatives who have hand set or the local agents of bank operators. As a

result, they withdraw all of the cash at a time fearing that if they keep money in the account it may be lost or taken by others. Main reason behind this is lack of knowledge on mobile banking, lack of trust on this type of new banking, illiteracy of the beneficiaries and awareness. Before introducing this type of new cash transfer model, proper training, awareness raising and technical support is must to make it successful.

6. Without having a handset, the beneficiaries would not be able to take the benefit of having a mobile bank account. Financial inclusion such savings, cash transfer for business purpose, receiving cash from product selling through mobile bank account etc. also not be possible without necessary training and orientation. Project should keep provision of handset along with training and orientation on mobile cash transfer while designing the project and duration of the project should be at least 18 months.
7. Access to public and private services at local and district level is very much important for the success and sustainability of the livelihoods especially for the agro-based interventions. Initiative to establish very strong and functional linkage between project participants and service providers must be considered from the beginning of the project.
8. Any type of livelihoods intervention cannot be successful and sustain if fair price of the product is not ensured. For this, access to local and district level markets and strong linkage with market actors especially input sellers and product buyers are very much important. It cannot be achieved if the project beneficiaries do not organize in groups and they do not achieve bargaining capacity with market actors. So initiative must be taken to organize project beneficiaries in groups and provide training on marketing techniques and bargaining capacity development.
9. Most of the beneficiaries utilized the cash grant properly and managed to undertake alternative and diversified livelihoods options. But all of them perceive that there is still a moderate to high risk of waterlogging and their livelihoods are not well protected. So to keep the already repaired and

reconstructed community infrastructures well-functioning, UDMCs must take responsibility for regular repair and maintenance.

10. A coordinated initiative by all relevant stakeholders (LGED, BWDB, Department of Agriculture, Department of Fisheries, Department of Livestock, local authorities) must be taken to reduce the waterlogging risk in Satkhira district.

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## Annex – 1: Household Survey Questionnaire

পোস্ট গ্রাজুয়েট প্রোগ্রাম ইন ডিজাস্টার ম্যানেজমেন্ট (পিপিডিএম) নমুনা নম্বর

ব্র্যাক বিশ্ববিদ্যালয়

৪র্থ সেমিস্টার (সামার)

গবেষণা এলাকা : সদর উপজেলা, সাতক্ষীরা

### বাংলাদেশের দক্ষিণ-পশ্চিমাঞ্চলে জলাবদ্ধতায় ক্ষতিগ্রস্ত জনগোষ্ঠীর জীবিকার পুনরুদ্ধারে ক্যাশ ভিত্তিক কর্মসূচীর উপর ভূমিকাঃ সাতক্ষীরা সদর উপজেলার উপর একটি সমীক্ষা

মাঠ পর্যায়ের তথ্যভিত্তিক এই গবেষণাটি ব্র্যাক বিশ্ববিদ্যালয়ের স্থাপত্যকলা বিভাগের অধীনে “পিপিডিএম” প্রোগ্রামের শিক্ষা কার্যক্রমের অংশবিশেষ এবং এ গবেষণার স্থান হিসেবে সাতক্ষীরা সদর উপজেলা নির্বাচন করা হয়েছে। সাতক্ষীরা বাংলাদেশের একটি অন্যতম দুর্ভোগপ্রবণ এলাকা। ২০০৯ সনে অনুষ্ঠিত ঘূর্ণিঝড় আইলা এ অঞ্চলের বিস্তীর্ণ এলাকা প্রাণহীন করে। বিভিন্ন ধরনের প্রাকৃতিক ও মানবসৃষ্ট কারণে এতদ্ব্যতীত স্থায়ী জলাবদ্ধতার সৃষ্টি হয়। ২০১১ সালে এ জলাবদ্ধতা ভয়াবহ আকার ধারণ করে এবং এর পর থেকেই দীর্ঘমেয়াদী জলাবদ্ধতার বর্তমান গবেষণায় সাতক্ষীরা সদর উপজেলার জলাবদ্ধতার ফলে ক্ষতিগ্রস্ত জনগোষ্ঠীর জীবিকার উপর প্রভাবের সার্বিক চিত্র তুলে ধরা হবে। এছাড়া কিভাবে স্থায়ী জলাবদ্ধতা দূর করে জনগণের দুর্ভোগ কমিয়ে জীবনযাত্রা ও জীবিকা পূর্বাবস্থায় ফিরিয়ে আনা যায়- এ সম্পর্কে আলোকপাত করা হবে। মাঠ পর্যায়ের সংগৃহীত তথ্যাদি শুধুমাত্র ছাত্র-ছাত্রীদের শিক্ষা কার্যক্রমে ব্যবহৃত হবে। এ বিষয়ে সম্মানিত উত্তরদাতাদের মূল্যবান সময় ও তথ্য দেয়ার জন্য ভূগোল ও পরিবেশ বিভাগ বিশেষভাবে কৃতজ্ঞ থাকবে।

### খানা পরিবার জরিপ প্রশ্নমালা

সমীক্ষা এলাকাঃ গ্রাম ..... ইউনিয়ন ..... উপজেলা .....

স্বাক্ষরিত গ্রহীতার নাম ..... স্বাক্ষরিত গ্রহণের তারিখ .....

স্বাক্ষরিতদাতার বয়স ..... পরিবার প্রধানের সাথে সম্পর্ক .....

১। পরিবারে ধরন (টিক চিহ্ন দিন)ঃক) একক পরিবার খ) যৌথ পরিবার গ) বর্ধিত পরিবার ঘ) অন্যান্য ...(নির্দিষ্ট করে লিখুন)

২। পরিবারে সদস্যদের সম্পর্কে কিছু তথ্যঃ(নিম্নে প্রদত্ত নির্দেশনা অনুসরণ করুন)

সদস্যদের নাম	পরিবারের প্রধানের সাথে সম্পর্ক	বয়স	লিঙ্গ	শিক্ষাগত-যোগ্যতা	বৈবাহিক অবস্থা	কি কাজ করেন	কোথায় কাজ করেন
০১	০২	০৩	০৪	০৫*	০৬*	০৭*	০৮*



\*০৫ঃ ৬ বছরের নিচে প্রযোজ্য নয়  
 ক) অশিক্ষিত  
 খ) প্রাথমিক শিক্ষা  
 গ) ৮ম শ্রেণী পাশ  
 ঘ) এসএসসি পাশ  
 ঙ) এইচএসসি পাশ  
 চ) স্নাতক/সম্মান  
 ছ) মাস্টার্স  
 জ) অন্যান্য  
 .....

\*০৬ঃ ক) অবিবাহিত  
 খ) বিবাহিত  
 গ) বিপত্তীক  
 ঘ) তালাক প্রাপ্ত  
 ঙ) পৃথক

\*০৭ঃ ক) প্রযোজ্য নয়  
 খ) গৃহস্থালীর কাজ  
 গ) ছাত্র  
 ঘ) বেকার  
 ঙ) কৃষিকাজ  
 চ) ছোট ব্যবসা  
 ছ) চাকুরী (নির্দিষ্ট করণ)  
 জ) দিন মজুর (কৃষি)  
 ঝ) দিন মজুর (অকৃষি)  
 ঞ) অন্যান্য (নাম লিখুন)

\*০৮ঃ ক) নিজের ইউনিয়নে  
 খ) নিজ উপজেলায়  
 গ) নিজ জেলায়  
 ঘ) খুলনা শহরে  
 ঙ) অন্য জেলায়  
 চ) অন্যান্য (নির্দিষ্ট করণ)

৩ (ক) জলাবদ্ধতার পূর্বে আপনার প্রধান পেশা কি ছিল ?(নাম লিখুন)

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৩ (খ) যদি অন্যান্য কোন পেশা থাকে তবে নাম লিখুন

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৪ জলাবদ্ধতার পূর্বে আপনার কি কি সম্পদ ছিল?

সম্পদের ধরন	সংখ্যা/পরিমাণ	মূল্যমান (টাকায়)	মন্তব্য
১. বসত বাড়ি (শতাংশ)			উৎপাদনশীল
২. আবাদ যোগ্য জমি (শতাংশ)			উৎপাদনশীল
৩. পুকুর/ঘের (শতাংশ)			উৎপাদনশীল
৪. গবাদি পশু -			উৎপাদনশীল
গরু			উৎপাদনশীল
ছাগল/ভেড়া			উৎপাদনশীল
হাঁস/মুরগী			উৎপাদনশীল
কবুতর			উৎপাদনশীল
৫. রিক্সা/ভ্যান			উৎপাদনশীল
৬. সেলাই মেশিন			উৎপাদনশীল
৭. কৃষি উপকরণ-			উৎপাদনশীল
পাওয়ার টিলার			উৎপাদনশীল
মাড়াই যন্ত্র			উৎপাদনশীল
সেচ যন্ত্র			উৎপাদনশীল
অন্যান্য যদি থাকে			উৎপাদনশীল
৮. ক্ষুদ্র ব্যবসা সংক্রান্ত (দোকান, কাঁচামাল ইত্যাদি)			উৎপাদনশীল
৯. বাইসাইকেল			অনুৎপাদনশীল
১০. মোবাইল ফোন			অনুৎপাদনশীল
১১. টেলিভিশন			অনুৎপাদনশীল
১২. গহনা			অনুৎপাদনশীল
১৩. অন্যান্য			অনুৎপাদনশীল

৫. জলাবদ্ধতার পূর্বে আপনার আয়ের উৎস এবং মাসিক আয় কত ছিল?

আয়ের উৎস	দৈনিক আয় (টাকা)	মাসিক আয় (টাকা)	মন্তব্য
১.			
২.			
৩.			
৪.			
৫.			
৬.			
৭.			
৮.			
৯.			
১০.			
১১.			
১২.			
১৩.			
১৪.			
সর্বমোট আয়			

৬ (ক) জলাবদ্ধতা আপনার জীবিকার উৎসের উপর কি কি বিরূপ প্রভাব ফেলেছিল?

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৬ (খ) জলাবদ্ধতা আপনার মাসিক আয়ের উপর কি প্রভাব ফেলেছিল?

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৭ (ক) জলাবদ্ধতার বিরূপ প্রভাবের সাথে খাপ খাওয়ানোর জন্য আপনি কি উপায় অবলম্বন করেছেন?

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৭ (খ) জলাবদ্ধতার সময় বেচে থাকার জন্য আপনার কি কোন সম্পদ বিক্রি করতে হয়েছে?(টিক চিহ্ন দিন)

ক. হ্যাঁ      খ.না

যদি হ্যাঁ হয়ে থাকে তবে, সম্পদ গুলোর নাম লিখুন -

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৮. জলাবদ্ধতার পরবর্তী সময়ে আপনার কি কি দায়/দেনা ছিল? (সহযোগিতা পাওয়ার আগ পর্যন্ত)

দায় বা দেনার ধরন	পরিমাণ (টাকা)	মন্তব্য
ব্যাংক ঋণ		
এনজিও ঋণ		
মহাজনের কাছে ঋণ		
বন্ধুবান্ধব বা আত্মীয় স্বজনের কাছে ঋণ		
মোট		

৮ (ক) জলাবদ্ধতার কারণে ক্ষতিগ্রস্ত জীবিকা পুনরুদ্ধারের জন্য আপনি কি ধরনের সহযোগিতা পেয়েছেন?

সহযোগিতার উৎস	ধরন	পরিমাণ (টাকা)	সাল
মোট			

৮ (খ) অন্যান্য সহযোগিতা (যদি পেয়ে থাকেন)

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৯. প্রাপ্ত সহযোগিতা আপনি জীবিকা পুনরুদ্ধার বা উন্নয়নের জন্য কিভাবে কাজে লাগিয়েছেন?

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১০. বর্তমানে আপনি জীবিকা নির্বাহের জন্য কি কি পেশা অবলম্বন করছেন? (নাম লিখুন)

ক) প্রধান পেশাঃ

খ) অন্যান্য পেশাঃ

১১. বর্তমানে আপনার কি কি সম্পদ আছে?

সম্পদের ধরন	সংখ্যা/পরিমাণ	মূল্যমান (টাকায়)	মন্তব্য
১. বসত বাড়ি (শতাংশ)			উৎপাদনশীল
২. আবাদ যোগ্য জমি (শতাংশ)			উৎপাদনশীল
৩. পুকুর/ঘের (শতাংশ)			উৎপাদনশীল
৪. গবাদি পশু -			উৎপাদনশীল
- গরু			উৎপাদনশীল
- ছাগল/ভেড়া			উৎপাদনশীল
- হাঁস/মুরগী			উৎপাদনশীল
- কবুতর			উৎপাদনশীল
৫. রিক্সা/ভ্যান			উৎপাদনশীল
৬. সেলাই মেশিন			উৎপাদনশীল
৭. কৃষি উপকরণ-			উৎপাদনশীল
- পাওয়ার টিলার			উৎপাদনশীল
- মাড়াই যন্ত্র			উৎপাদনশীল
- সেচ যন্ত্র			উৎপাদনশীল
- অন্যান্য যদি থাকে			উৎপাদনশীল
৮. ক্ষুদ্র ব্যবসা সংক্রান্ত (দোকান, কাঁচামাল ইত্যাদি)			উৎপাদনশীল
৯. বাইসাইকেল			অনুৎপাদনশীল
১০. মোবাইল ফোন			অনুৎপাদনশীল
১১. টেলিভিশন			অনুৎপাদনশীল
১২. গহনা			অনুৎপাদনশীল
১৩. অন্যান্য			অনুৎপাদনশীল

১২. বর্তমানে আপনার আয়ের উৎস এবং মাসিক আয় কত?

আয়ের উৎস	দৈনিক আয় (টাকা)	মাসিক আয় (টাকা)	মন্তব্য
১.			
২.			
৩.			
৪.			
৫.			
৬.			
৭.			
৮.			
৯.			
১০.			
১১.			
১২.			
১৩.			
১৪.			
সর্বমোট আয়			

১২. বর্তমানে আপনার পরিবারের মাসিক ব্যয় কত?

ব্যয়ের খাত	পরিমাণ (টাকা)	মন্তব্য
১. খাদ্য দ্রব্য -		
- চাল/আটা		
- ডাল		
- তেল		
- লবণ/হলুদ/মরিচ/পিঁয়াজ/রসুন/মসলা ইত্যাদি		
- আলু এবং শাকসব্জী		
- মাছ/মাংস/ডিম/দুধ		
২. পোশাক পরিচ্ছদ		
৩. শিক্ষা		
৪. চিকিৎসা		
৫. যাতায়াত		
৬. জ্বালানী (রান্নার কাজে)		
৭. উৎপাদন মুখী কার্যক্রম -		
- সার/বীজ/চারা ও সেচের জন্য ব্যয়		
- কৃষি যন্ত্রপাতি ও জ্বালানী খাতে ব্যয়		
- হাঁস-মুরগী/গবাদি পশু ক্রয়		
- গবাদি পশুর খাদ্য, চিকিৎসা/টিকা বাবদ ব্যয়		
- মাছের পোনা মজুদ/খাদ্য সরবরাহ ব্যয়		
- হস্তশিল্প ও ক্ষুদ্র ব্যবসার উপকরণ ক্রয়		
- অন্যান্য		
৮. ঋণের কিস্তি/ দেনা পরিশোধ		
৯. অন্যান্য		
মোট ব্যয়		

১৩. বর্তমানে আপনার কি কি দায়/দেনা আছে?

দায় বা দেনার ধরন	পরিমাণ (টাকা)	মন্তব্য
ব্যাংক ঋণ		
এনজিও ঋণ		
মহাজনের কাছে ঋণ		
বন্ধুবান্ধব বা আত্মীয় স্বজনের কাছে ঋণ		
মোট		

১৪. পরিবারের খাদ্য গ্রহণঃ

ক) ফুড কনজাম্পশন স্কেল -

ফুড গ্রুপ	গত সপ্তাহে (৭ দিনে) কয় দিন আপনার পরিবার উল্লেখিত খাবারগুলো খেয়েছে? (যদি ১ দিন খায় তবে পাশের ঘরে ১ লিখুন, যদি ২ দিন খায় ২ লিখুন, এভাবে ৩ দিন খেলে ৩ -----)
১. শর্করা জাতীয় খাদ্য (ভাত/রুটি/চিড়া/মুড়ি/আলু/মিষ্টি আলু/খিচুড়ী)	
২. শাক-সব্জী (পাতা ও ফল জাতীয় যে কোন সব্জী)	
৩. প্রোবিন প্রোটিন (মাছ/মাংস/ডিম)	

ফুড গ্রুপ	গত সপ্তাহে (৭ দিনে) কয় দিন আপনার পরিবার উল্লেখিত খাবারগুলো খেয়েছে? (যদি ১ দিন খায় তবে পাশের ঘরে ১ লিখুন, যদি ২ দিন খায় ২ লিখুন, এভাবে ৩ দিন খেলে ৩ -----)
৪. ফল (দেশী বা বিদেশী যে কোন ফল)	
৫. উদ্ভিজ্জ প্রোটিন (যে কোন প্রকারের ডাল)	
৬. দুধ বা দুগ্ধজাতীয় খাদ্য	
৭. তেল বা চর্বি	
৮. মিষ্টি জাতীয় খাদ্য (চিনি, গুড়)	
৯. মসলা ও অন্যান্য (চা, কফি/ হলুদ, মরিচ, আদা, পিঁয়াজ, রসুন ইত্যাদি)	

১৫. ক্যাশ ভিত্তিক কার্যক্রমের ফলে আপনার ইউনিয়নের অবকাঠামোর ক্ষেত্রে (রাস্তা, ভেড়িবাঁধ, কালভার্ট, খাল ইত্যাদি) কি পরিবর্তন হয়েছে?

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১৬. জলাবদ্ধতায় আপনার এলাকার বিভিন্ন ক্ষেত্রে ঝুঁকির মাত্রা সম্পর্কে বলুন (√ দিন)।

	বেশি বিপদাপন্ন	মাঝারি বিপদাপন্ন	নিম্ন বিপদাপন্ন	ঝুঁকিহীন
ঘরবাড়ী				
কৃষি ফসল				
মৎস্য				
গৃহপালিত পশু পাখী				
গাছপালা ও বন				
সামাজিক প্রতিষ্ঠান (বাজার, শিক্ষা প্রতিষ্ঠান, কমিউনিটি ক্লিনিক, ধর্মীয় উপাসনালয় ইত্যাদি)				
যাতায়াত ব্যবস্থা ও অবকাঠামো				
স্যানিটেশন ও পয়ঃনিষ্কাশন				
শিল্প কারখানা (যদি থাকে)				
অন্যান্য				

১৭. নিচের বিষয়গুলো সম্বন্ধে দয়া করে তথ্য দিন।

ক) পানীয় জলের উৎস : ১। নল কুপ      ২। পুকুর      ৩। অন্যান্য .....

খ) পানি কিভাবে বিশুদ্ধ করেন?

১) ফুটিয়ে ২) ছেঁকে ৩) ফিটকিরি ৪) শোধনের প্রয়োজন নেই ৫) অন্যান্য -----

গ) সৌচাগারের ধরনঃ ১) স্বাস্থ্যকর ২) অস্বাস্থ্যকর ৩। সৌচাগারবিহীন

ঘ) সৌচাগারের গর্ত পুকুর/নদী/খাল এর সাথে যুক্ত কি না : ১) হ্যাঁ ২) না

চ) স্থানীয় স্বাস্থ্য কেন্দ্রে (কমিউনিটি ক্লিনিক/ইউনিয়ন স্বাস্থ্য কেন্দ্র) সেবা গ্রহণের জন্য যান কি না? ১) হ্যাঁ ২) না

ছ) বিভিন্ন সেবা পাওয়ার জন্য ইউনিয়ন পরিষদে এবং উপজেলা পর্যায়ে সেবাদানকারী অফিস (কৃষি, পশু সম্পদ, মৎস্য, সমাজ সেবা ইত্যাদি) এর সাথে যোগাযোগ করেন কি ন? ১) হ্যাঁ ২) না

জ) যদি হ্যাঁ হয়, কি কি সেবা পেয়েছেন দয়া করে উল্লেখ করুন:

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ঝ) আপনার উৎপাদিত পণ্য কোথায় বিক্রি করেন? ১) স্থানীয় বাজারে ২) উপজেলা সদরের বাজারে ৩) জেলা সদরে ৪) জেলার বাইরে

ঞ) আপনি কি উৎপাদিত পণ্যের ন্যায্য মূল্য পান? ১) হ্যাঁ ২) না

ড) স্কুলগামী ছেলেমেয়েরা নিয়মিত স্কুলে যায় কি না? ১) হ্যাঁ ২) না ৩) প্রযোজ্য নয়

(আমাদেরকে সময় ও মূল্যবান তথ্য দেয়ার জন্য আপনাকে ও আপনার পরিবারের সকলকে অশেষ ধন্যবাদ)

## Annex – 2: FGD Checklist

পোস্ট গ্র্যাজুয়েট প্রোগ্রাম ইন ডিজাস্টার ম্যানেজমেন্ট (পিপিডিএম) নমুনা নম্বর

ব্র্যাক বিশ্ববিদ্যালয়

৪র্থ সেমিস্টার (সামার)

গবেষণা এলাকা : সদর উপজেলা, সাতক্ষীরা

বাংলাদেশের দক্ষিণ-পশ্চিমাঞ্চলে জলাবদ্ধতায় ক্ষতিগ্রস্ত জনগোষ্ঠীর জীবিকার পুনরুদ্ধারে ক্যাশ ভিত্তিক কর্মসূচীর উপর ভূমিকাঃ সাতক্ষীরা সদর উপজেলার উপর একটি সমীক্ষা

মাঠ পর্যায়ের তথ্যভিত্তিক এই গবেষণাটি ব্র্যাক বিশ্ববিদ্যালয়ের স্থাপত্যকলা বিভাগের অধীনে “পিপিডিএম” প্রোগ্রামের শিক্ষা কার্যক্রমের অংশবিশেষ এবং এ গবেষণার স্থান হিসেবে সাতক্ষীরা সদর উপজেলা নির্বাচন করা হয়েছে। সাতক্ষীরা বাংলাদেশের একটি অন্যতম দুর্ভোগপ্রবণ এলাকা। ২০০৯ সনে অনুষ্ঠিত ঘূর্ণিঝড় আইলা এ অঞ্চলের বিস্তীর্ণ এলাকা প্লাবিত করে। বিভিন্ন ধরনের প্রাকৃতিক ও মানবসৃষ্ট কারণে এতদ্ব্যতীত স্থায়ী জলাবদ্ধতার সৃষ্টি হয়। ২০১১ সালে এ জলাবদ্ধতা ভয়াবহ আকার ধারণ করে এবং এর পর থেকেই দীর্ঘমেয়াদী জলাবদ্ধতার বর্তমান গবেষণায় সাতক্ষীরা সদর উপজেলার জলাবদ্ধতার ফলে ক্ষতিগ্রস্ত জনগোষ্ঠীর জীবিকার উপর প্রভাবের সার্বিক চিত্র তুলে ধরা হবে। এছাড়া কিভাবে স্থায়ী জলাবদ্ধতা দূর করে জনগণের দুর্ভোগ কমিয়ে জীবনযাত্রা ও জীবিকা পূর্বাবস্থায় ফিরিয়ে আনা যায়- এ সম্পর্কে আলোকপাত করা হবে। মাঠ পর্যায়ের সংগৃহীত তথ্যাদি শুধুমাত্র ছাত্র-ছাত্রীদের শিক্ষা কার্যক্রমে ব্যবহৃত হবে। এ বিষয়ে সম্মানিত উত্তরদাতাদের মূল্যবান সময় ও তথ্য দেয়ার জন্য ভূগোল ও পরিবেশ বিভাগ বিশেষভাবে কৃতজ্ঞ থাকবে।

সমীক্ষা এলাকাঃ গ্রাম ..... ইউনিয়ন ..... উপজেলা .....

স্বাক্ষর গ্রহীতার নাম ..... রোল নং : ..... স্বাক্ষর গ্রহণের তারিখ .....

### এফজিডি প্রশ্নমালা

১। এ অঞ্চলে দীর্ঘ জলাবদ্ধতার কারণ সম্পর্কে আপনার ধারণা বলুনঃ

ক) প্রাকৃতিক কারণ : .....

ক) মানবসৃষ্ট কারণ : .....

২। জলাবদ্ধতায় আপনার এলাকার বিভিন্ন ক্ষেত্রে কি ধরনের সমস্যা দেখা দিয়েছে?

ক্রমিক নং	ক্ষেত্রসমূহ	সমস্যা ও ধরন
০১	আবাসন	
০২	কৃষি ফসল	
০৩	মৎস্য চাষ	
০৪	গৃহপালিত জীবজন্তু পালন	



০৫	গাছপালা ও বন সংরক্ষণ	
০৬	শিক্ষা প্রতিষ্ঠানসমূহ সচল রাখা	
০৭	স্বাস্থ্য ব্যবস্থা ঠিক রাখা	
০৮	যাতায়াত ব্যবস্থা ও অবকাঠামো	
০৯	শিল্প কারখানা সচল রাখা	
১০	হাট বাজার সচল রাখা	
১১	অন্যান্য	

৩। জলাবদ্ধতায় আপনার এলাকায় মানুষের জীবিকার কি ধরনের পরিবর্তন সাধিত হয়েছে?

ক) কৃষিক্ষেত্রে : .....

খ) মৎস্যক্ষেত্রে : .....

গ) দিনমজুর : .....

ঘ) ব্যবসা বাণিজ্য : .....

৪। জীবিকার নিরাপত্তার ক্ষেত্রে নিচের বিভিন্ন শ্রেণীর মানুষের ঝুঁকি মাত্রা চিহ্নিত করুন (√ দিন)।

ক্রমিক নং	বেশি বিপদাপন্ন	মাঝারি বিপদাপন্ন	নিম্ন বিপদাপন্ন	ঝুঁকিহীন
০১	বড় কৃষক			
০২	মাঝারি কৃষক			
০৩	ক্ষুদ্র কৃষক			
০৪	মৎস্যজীবী			
০৫	মৎস্য ব্যবসায়ী			
০৬	কৃষি দিনমজুর			
০৭	অকৃষি দিনমজুর			
০৮	বর্গাচারী			
০৯	মহিলা পরিবার প্রধান			
১০	ভূমিহীন কৃষক			
১১	ক্ষুদ্র ব্যবসা			
১২	যানবাহনের কাজ			
১৩	অন্যান্য			

৬। জলাবদ্ধতা সমস্যা সমাধানে আপনার এলাকায় এ পর্যন্ত কোন সংস্থা/প্রতিষ্ঠান সহায়তা প্রদান করেছে কিনা? করে থাকলে বিস্তারিত তথ্য দিন

ক্রমিক নং	সংস্থা/প্রতিষ্ঠান	কি কি পদক্ষেপ নিয়েছে	পদক্ষেপ সম্পর্কে মন্তব্য
০১	ব্যক্তিগত উদ্যোগ		
০২	এলজিইডি		
০৩	জনপ্রশাসন		

ক্রমিক নং	সংস্থা/প্রতিষ্ঠান	কি কি পদক্ষেপ নিয়েছে	পদক্ষেপ সম্পর্কে মন্তব্য
০৪	এনজিও (নির্দিষ্ট করে বলুন)		
০৫	দাতা সংস্থা (নির্দিষ্ট করে বলুন)		
০৬	দাতা দেশ		
০৭	অন্যান্য		

৭। জলাবদ্ধতা স্থায়ী নিরসনে এবং ক্ষতিগ্রস্ত মানুষের জীবিকার পুনরুদ্ধারে নিচের বিভিন্ন শ্রেণী/গোষ্ঠী/প্রতিষ্ঠান কি ভূমিকা পালন করেছে?

#	প্রতিষ্ঠান	ভূমিকা
০১	পরিবার	
০২	এলাকাবাসী	
০৩	স্থানীয় জনপ্রতিনিধি	
০৪	এলজিইডি/ বাংলাদেশ ওয়াটার ডেভেলপমেন্ট বোর্ড	
০৫	ইন্টারন্যাশনাল এনজিও	
০৬	ন্যাশনাল এনজিও	
০৭	সরকারী বিভাগ/অধিদপ্তর	
০৮	অন্যান্য	

৮. ক্যাশ ভিত্তিক কার্যক্রমের ফলে আপনার ইউনিয়নের অবকাঠামোর ক্ষেত্রে (রাস্তা, ভেড়িবাঁধ, কালভার্ট, খাল ইত্যাদি) কি পরিবর্তন হয়েছে?

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৯। ক্যাশ ভিত্তিক কার্যক্রমের ফলে আপনার ইউনিয়নের ক্ষতিগ্রস্থ মানুষের জীবিকার ক্ষেত্রে কি ধরনের পরিবর্তন এসেছে?

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(আমাদেরকে সময় ও মূল্যবান তথ্য দেয়ার জন্য আপনাকে ও আপনার পরিবারের সকলকে অশেষ ধন্যবাদ)