GRRIPP South Asia

# Action Research on

## Devastating Flash Flood in North-East Bangladesh and Assam, India :Through Gender and Intersectional Lens

GRRIPP
Gender Responsive Resilience and Intersectionality in Policy and Practice

# ABBREVIATIONS

ADB-Asian Development Bank

ADPC-Asian Disaster Preparedness Centre

BDPC-Bangladesh Disaster Preparedness Centre

BRAC-Building Resource across Community

BWDB-Bangladesh Water Development Board

CARE-Cooperative Assistance for Relief Everywhere

CBO-Community Based Organization

CEGIS-Centre for Environmental Geographic Information Services

CPP- Cyclone Preparedness Program

DDMC-District Disaster Management Committee

DFID-Department for International Development

DoE-Department of Environment

ERA-Effort for Rural Advancement

FFW-Food for Work

FGD-Focused Group Discussion

FRRAS-Flash Flood Risks Reduction Activities in Sunamganj

GIS-Geographical Information System

GO- Government Organization

GoB- Government of Bangladesh

HBNC-*Haor* Bannya Niontron Committee

IKS-Indigenous Knowledge System

LGED-Local Government Engineering Department

NGO- Non Government Organization

PIC-Project Implementation Committee

PIO-Project Implementation Committee

SDC- Swiss Agency for Development and Cooperation

UDMC-Union Disaster Management Committee

UNDP-United Nations Development Program

VGF-Vulnerable Group Feeding

WB-World Bank

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# 1. Introduction

## 1.1 Background: The Flood and Flash Flood Context

Disasters may arise due to natural forces that are exacerbated by human activities. While some disasters may arise suddenly, others may develop gradually. Flood mishaps may be classified as some of the most abrupt and severe disaster types, but they are among the few in this category that can be substantially predicted, controlled, and anticipated.

Like other types of disasters, floods can no longer be categorized as devastating solely on the basis of the peculiarity of their occurrences. When they intentionally cause damage or adverse consequences to human lives, livelihoods, and/or residences, they do indeed qualify as disasters. Floods are among the most widespread disaster activities, impacting the greatest number of countries and resulting in the greatest number of fatalities (Ghapar et al., 2018). Similar to other types of catastrophes, floods possess the capacity to cause significant disruptions in communities and alter the way of life of individuals residing in the impacted regions.

The term "flood" found in the old English language is comparable to the German and Dutch words "flut" and "vloed," which mean "water inflow" and "waft," respectively [Adams, 2008; Ahamed & Moeeni, 2019]. Flood is defined by the Oxford Reference Dictionary (ORD) as an influx or overflow of water that exceeds the typical boundaries of nature. Floods frequently occur when the volume of water in a body of water, such as a lake or river, surpasses its maximum carrying capacity, leading to the overflow of portions of the water beyond the normal perimeter of the body. Flooding transpires in virtually every region of the industry, manifesting in distinct intensities and consequences. Several exceptional floods have occurred, including those along the Chiang Jiang (Yangtze) river in China in 1981, 1991, and 2002; the Mozambican floods of 2000; and the Mississippi river floods of 1983 and 1993. (Adams 2008).

Enhanced susceptibilities to extreme events, specifically floods, are emerging as a "new everyday" phenomenon in both developing and developed nations (Mirza, 2003; Thomalla et al., 2006). There is a rapid expansion of the residential and commercial sectors, as well as the population and property, which are all susceptible to damage at some point (Hallegatte et al., 2013; Singh and Zommers, 2014). Moreover, despite the fact that flood-related fatalities have decreased significantly over the past several decades due to enhanced early warning systems and improved flood control infrastructure, the facts indicate that humans continue to be (indirectly) affected by these activities. As an illustration, Guha-Sapir et al. (2016) reported in their yearly disaster statistical report of 2016 that approximately thirteen.7 percent of the global population, or 78.1 million individuals, were impacted by hydrologic failures (floods and landslides) in 2016. It is worth noting that sixty million of the total 78.1 million populations in China have been affected by a single flood.

When considering the phenomenon of flash floods collectively, they become a notable and recurrent natural peril in South Asia, specifically in the nations of Bangladesh and India (Smith et al., 2020; Sharma and Patel, 2018). The susceptibility of this area to flash floods is attributed to a confluence of elements, encompassing expansive riverine networks, monsoonal weather patterns, and topographical characteristics (Das and Rahman, 2019). The monsoon season, customarily spanning from June to September, inundates the area with substantial precipitation, leading to the encroachment of waterways, saturated soils, and increased vulnerabilities to flood (Kumar et al., 2021).

Bangladesh is particularly susceptible to flash floods due to its complex river system and low-lying plains-dominated regional topography (Haque et al., 2017). The Brahmaputra, Ganges, and Meghna rivers, in addition to their extensive network of tributaries, exert a significant influence on the regional flood dynamics (Rahman and Chowdhury, 2016). The potential ramifications of flash floods in Bangladesh are far-reaching, encompassing the displacement of communities and millions of individuals, as well as significant infrastructure and agricultural destruction (Ahmed et al., 2020).

In a similar manner, the varied topography of India, which spans from the coastal plains to the Himalayas, contributes to the country's varied flash flood landscape (Singh and Mishra, 2018). The Himalayan region is prone to glacial lake outburst floods, whereas rapid urbanisation and inadequate drainage systems present difficulties in the densely populated plains and urban areas (Sharma et al., 2019). Communities and ecosystems are frequently impacted by flash floods that occur during the monsoon in states such as Assam and Bihar (Goswami and Haldar, 2020).

## 1.2 Flash Flood Context of Assam, India

### 1.2.1 Historical Overview of Assam's Flood Context:

Assam is a river-rich region. Rivers are one of the primary resources utilised by nearby humans. Drought and flood pose a significant risk to human life and property along the river. Consequently, they possess the capacity for social, economic, and physical significance. In Assam, flood is most likely the most frequent, widespread, and recurrent natural hazard.

Due to its extensive river network, Assam is susceptible to natural disasters such as flood and erosion, both of which detrimentally affect the state's overall progress. The Brahmaputra and Barak Rivers, which are nourished by over fifty tributaries, annually inflict devastation during the monsoon season through flood. A natural occurrence, flood occurs in the Brahmaputra and Barak Valleys of Assam. Assam is a state abundant in agricultural land and natural resources. Over eighty percent of the population relies on agriculture; however, Assam has been confronted with significant river erosion issues for over six decades, which are intricately linked to the flood problem.

In Assam, flooding is neither novel nor unprecedented; it has occurred frequently throughout the region's history. Seismic activity and catastrophic floods have impacted the region of erstwhile undivided Assam, creating lasting memories. Despite having encountered numerous catastrophic floods throughout its history, the occurrence of such phenomena escalated significantly following the earthquake of the 1950s in Assam. Severe floods transpired on the following dates: 1954, 1962, 1972, 1977, 1984, 1988, 1998, 2002, 2004, 2012, and 2019 and 2020, to date. As of the year 2022, approximately 5.5 million individuals were impacted by the floods in 32 of the 35 districts of Assam. It is one of the most destructive floods in Assam, having caused significant erosion and displacement as well as the destruction of homes, roads, railways, and bridges; the death toll has risen to 190 (with the number of unreported deaths likely to be even higher).

Due to its vast river network, Assam is susceptible to natural disasters such as erosion and flooding, which have a substantial detrimental effect on the state's overall progress. The Brahmaputra and Barak Rivers, which receive water from over fifty tributaries, annually cause catastrophic flood during the monsoon season. In comparison to other states, the flood and soil degradation problems in Assam are unparalleled in terms of both the frequency and severity of flooding, as well as the consequence of erosion. According to the Rastriya Barh Ayog (RBA), the flood-prone region of the state comprises 31.05 Lakh Hectares, or approximately 39.58 percent, of the state's total area of 78.523 Lakh Hectares. This constitutes approximately 40% of the entire flood-prone area in the nation. The average annual area impacted by floods is 9.31 lakh hectares, according to available data. The flood-prone region of Assam comprises 39 percent of the country's total area, compared to 10.2 percent for the nation as a whole. This indicates that the flood-prone area in Assam is four times larger than the national average for flood-prone areas in the United States. Significant floods struck Assam in the years following independence: 1954, 1962, 1972, 1977, 1984, 1988, 1998, 2002, 2004, and 2012. Three to four waves of flooding devastate the flood-prone regions of Assam nearly every year. The mean yearly devastation caused by floods in Assam amounts to approximately Rs. 200.00 Crores. Notably, the extent of the damage inflicted was approximately Rs. 500.00 Crores in 1998, and Rs. 771.00 Crores in 2004. The state of Assam is also confronted with the significant challenge of bank erosion caused by the Brahmaputra, Barak, and their tributaries. Annually, erosion causes damages amounting to several hundred crores. More than 4.27 lakh hectares of land, or 7.40 percent of the state's total area, have been eroded away by the river Brahmaputra and its tributaries since 1950. This represents a significant problem that has persisted for the past six decades. The estimated annual average land loss is nearly 8000 ha. Due to bank erosion, the river Brahmaputra has widened in some locations by as much as 15 kilometers.

### 1.2.2 Weather Patterns and Recent Flood Events in Assam

In order to gain insight into the causes of the recurrent floods in Assam, an examination of historical records of similar incidents is necessary. In his article "Aftermath of the Notable Assam Earthquake of 1950," the eminent British botanist Francis Kingdon-Ward (1955) offered a credible explanation for the origins of the Assam floods. Kingdon-Ward, a frequent traveller in the eastern Himalayas, was in close proximity to the 1950 earthquake epicentre in Rima. Kingdon-Ward (1995) asserts that prior to 1950, inundations along the Brahmaputra were not an unprecedented occurrence, transpiring on average every ten years. Severe flooding has become an annual occurrence since the earthquake, with the most catastrophic flood occurring in 1954. Ever since the 1950s, Assam has been beset by catastrophic flooding, proving that his prognosis was accurate.

Kingdon-Ward has identified three principal factors that contribute to flooding in the north-eastern frontier region: permanent glaciers, annual blizzards, and substantial precipitation. The amount of water derived from these sources exhibits seasonal and climatic variation. He emphasised the significance of a confluence of circumstances that result in substantial flooding, specifically when a severe winter snowstorm is succeeded by a warm spring and summer, which coincide with the height of precipitation. Kingdon-Ward foresaw dire repercussions should these conditions materialise in a given year. The speaker emphasised the temporal aspects of annual water level and flood peaks, noting that the initial surge occurs in April as a consequence of snowmelt, and the subsequent surge occurs in July due to a confluence of snowmelt, augmented glacier melt, and precipitation—a substantially greater magnitude than the initial surge.

The 2022 flood appears to correspond with Kingdon-hypothesis, Ward's notwithstanding the insufficiency of empirical evidence to definitively validate his assertion. The Northeast region has experienced a comparable adverse weather pattern characterised by snowfall, thunderstorms, hailstorms, and prolonged heavy pre-monsoon and monsoon rainfall. The initial surge of the flood in Assam transpired in April 2022; however, it was widely documented by mid-May 2022, inflicting substantial devastation across multiple districts. It caused landslides that destroyed railway tracks, stations, roads, bridges, and irrigation canals, transforming stretches of railway track into makeshift bridges. Following this, in June, torrential monsoon precipitation coincided with the melting of glaciers in the eastern Himalayas, which caused rivers to overflow and transformed the entire state into an inland sea. The second-most populous city, Silchar, was submerged in water on June 20, and it remained flooded for weeks. In May and June, Guwahati, the capital city, encountered numerous instances of inundation. As of July, the flood situation in Assam continues to be dire, affecting millions of people across more than ten districts. Approximately 30,000 to 40,000 residences have been demolished thus far, according to the chief minister of the state.

### 1.2.3 Causes and Impacts of Assam's Floods:

Recurrent flood in Assam can be attributed to a combination of various unscientific human activities and a multitude of natural factors.

- One of the most significant determinants of flooding in the state is the excessive precipitation during the monsoon season. This phenomenon is truly unique, as a substantial portion of the state is severely impacted by floods each year.
- Important events also transpire due to the geographical location of the area; since the area is surrounded by hills, precipitation and snowmelt from within the hilly regions immediately flow downstream, and as a result, the river water level rises, compelling the embankments of the rivers to breach.
- Inadequate drainage capacity and drainage congestion caused by roads, bridges, railroad tracks, and buildings, as well as the installation of sluices, have impeded the natural flow of water in vulnerable regions, compelling the reinforcement of embankments.
- In Assam, deforestation is one of the primary human-caused causes of flooding. As a result of ongoing deforestation, enormous quantities of topsoil are deposited during rainfall. As a result of the soil's discharge into the river, the river water accumulates a substantial amount of silt and sediment, causing the river beds to rise in elevation. Such circumstances render the primary channel incapable of handling the substantial volume of water acquired during precipitation events.

The south bank tributaries of the Brahmaputra in lower Assam encountered high-magnitude flash floods in 2004 and 2014, respectively, as a result of cloud bursts in the catchment areas of Meghalaya. A cloud burst in the catchment area of Arunachal Pradesh caused extremely high-magnitude flash floods in the rivers Gainadi and Jiadhal in August 2011. The flash floods in question inflicted extensive destruction across vast regions, resulting in human casualties.

In addition to Brahmaputra, Barak, an additional significant river of the state, traverses the flat valley regions of Cachar and Karimganj districts over a distance of 192 kilometres. Barak's channel is predominantly meandering. The principal causes of flooding in Barak Valley are drainage congestion and inadequate allocation of rainwater.

In May of 2022, heavy pre-monsoon precipitation caused flooding that wreaked havoc in the Barak Valley, particularly in the Cachar district, where, according to data from the state disaster management agency, over 1.59 lakh residents were affected. May and June floods in the Barak Valley were precipitation that was excessive for a brief period of time. In addition to inadequate drainage systems and plastic waste, unplanned urbanisation and the development of naturally low-lying areas have also contributed.

Based on data presented by Sunit Das, a senior scientist at the India Meteorological Department, the actual precipitation in Silchar from June 21st to that date amounted to 930 millimetres, representing a 490 millimetre deviation from the yearly average. The severely inundated Barak River weakened the already compromised dyke, and the ensuing inundation surpassed all containment efforts. On June 20, 2022, water infiltrated the urban areas of Silchar through this compromised section of the Bethukandi embankment, thereby submerging the majority of the town. "As the night progressed, portions of the town became submerged within an hour or so, and the remainder followed suit," A flood engulfed nearly every inch of the city, an occurrence that no one there had ever before seen in history. This unprecedented flood event occurred in Silchar as a result of the Barak River overflowing an embankment at Bethukandi. As a result of the Bethukandi breach, Barak overflowed with water, which overnight submerged Silchar. The situation was akin to "nowhere to go, nowhere to seek shelter" for the inhabitants. Amidst the near-ten-day standstill, this flash flood impacted the majority of city life. The largest town in South Assam and the entryway to the Barak valley, Silchar, has experienced a traumatic event. .

## 1.3 Flash Flood Context of Sunamganj, Bangladesh

### 1.3.1 General Overview of Flooding in Bangladesh

Flooding is a prevalent occurrence in Bangladesh and ranks among the most significant natural perils that the Bangladeshi people must routinely confront. Flooding typically impacts approximately 20.5 percent of Bangladesh's landmass (Paul & Routray, 2010). Periodically, abnormal flooding also transpires in Bangladesh. The local term "banna" refers to the devastation of homes, livelihoods, properties, and lives caused by abnormal flooding. Nevertheless, flooding is not consistently regarded as a peril. Normal flooding is regarded as a beneficial phenomenon due to its ability to replenish the soil in the floodplain with essential nutrients. Borsha is the local vocabulary term for typical flooding (Haque, 1993).

### 1.3.2 Geographical and Climatic Context of Flooding in Bangladesh

Bangladesh is a riverine country and one of the largest deltas in the world. 80% area of Bangladesh is a riverine floodplain (Brammer, 1990). Its climate contains sub-tropical monsoons with average annual precipitation of 2,300 mm. The annual precipitation pattern is geographically asymmetrical; for example, annual precipitation is over 5,000 mm in the eastern region and around 1,200 mm in the western part of the country. Three mighty rivers, namely the Ganges, the Brahmaputra and the Meghna, along with more than two hundred small and medium size rivers, carry a huge volume of rainwater during monsoon season every year (BWDB, 2009). The land on the eastern part of Brahmaputra is low-lying compared to the land of the western part. The eastern part consists of the major floodplains of the Ganges, the Brahmaputra and the Meghna, which are typically large depressions formed during the process of delta building particularly in greater Mymensingh and Sylhet

districts[1]. Consequently, these low-lying areas are seasonally flooded every year (BWDB, 2009).

### 1.3.3 Haor Ecosystem & Flash Flood Characteristics: The Case of North-Eastern Part of Bangladesh

There are three types of abnormal floods or *banna* in the floodplain area, such as *monsoon* or *river floods*, *rainwater floods*, and *flash floods*. These types of floods affect different regions, though overlap. Another type of flooding is called *coastal* or *storm-surge flooding*, which is associated with tropical cyclones in the Bay of Bengal. *Monsoon* or *river flooding* is caused by monsoon rainfall (particularly in the Himalayas) and by major rivers. However, a flash flood is caused by heavy or excessive rainfall in a short period of time over a relatively small area, is referred as a flash flood. In flash flood, water level rises and falls quite rapidly with little or no advance warning. Typically, this occurs in areas where the upstream basin topography is relatively steep and the concentration-time of the basin is relatively short. In Bangladesh, flash floods generally occur in the northeast, southeast and Chittagong region. But the devastating and extended flash flood is a recurrent phenomenon in the northeast region of Bangladesh. The extremely flashy character of the rivers and sudden excessive rainfall in the region causes frequent flash floods in the northeastern areas.

The northeastern part of Bangladesh is most prone to flash flood hazards because these regions are low-lying and located at the foothills of the Meghalaya Mountain chain. This low-lying part consists of a bowl-shaped depression containing many wetland areas, locally known as *Haor*[2] (wetland). These areas experience greater amounts of annual rainfall than the rest of the country. Due to their unique physical and social conditions, Haor inhabitants tend to be vulnerable to both riverine and flash floods. Despite this underlying vulnerability, people in the Haor region have been living with various hydro meteorological hazards (e.g., floods, tropical storms, water-logging) for centuries, demonstrating a strong resilience to these natural hazards in the region (Soja & Starkel, 2007; Suman & Bhattacharya, 2015).

The Haor basin experiences periods of stagnant or flash flooding water conditions from June to November. During the Rabi season (mid-November to April), Boro rice, which is primarily cultivated from November to May under irrigated conditions, is primarily cultivated using irrigation. During the wet season, this region's highly productive fisheries are the result of the natural flooding pattern. Haor households derive the majority of their income from single-crop cultivation and other pertinent endeavours. People strive to save money in order

1. Greater *Sylhet* district includes the districts of *Sylhet, Sunamganj, Habiganj, and Moulivibazar*
2. The *Haors, baors, beels and jheels* are of fluvial origin and are commonly identified as freshwater wetlands. Haors are particularly low-lying, physiographic depressions or floodplain wet-lands that are commonly found in Northeastern Bangladesh.

to maintain their standard of living during the non-crop season, which consists of a deluge that lasts for five to six months and hinders their ability to work in numerous ways. The ecological, geographical, and environmental characteristics of the Haor region influence this crop. Arbuscular aridity, hailstorms, and flash floods are the specific causes of crop damage. Notwithstanding its reliance on a solitary agricultural produce and the frequent occurrence of flash floods, the Haor region sustains an estimated twenty million individuals, encompasses nearly one-fifth of the nation's total land area, and contributes to the nation's overall staple food supply (rice) (Kamruzzaman and Shaw, 2018). The central region of Haor is also known as the Sylhet basin or the Sylhet area.

The Sylhet region comprises approximately 411 Haors, which are utilised for agricultural purposes during dry seasons and revert to fishing as the sole viable means of subsistence during the monsoon season (CEGIS, 2012). Frequent crop damage during pre-monsoon flooding in these regions poses a threat to rice production. Nonetheless, flash floods result from heavy precipitation in the upper catchment regions of India; they destroy homes and crop fields and cause misery for the locals. Cherrapunji, the location that receives the highest annual precipitation globally, is situated to the north of the Haor basin. Rainwater proceeds downstream via various channels and enters Bangladesh from the south (Suman & Bhattacharya, 2015). In addition to early flooding, this wetland community is susceptible to post-monsoon and extreme monsoon flash floods. In contrast to earlier floods, monsoon and post-monsoon floods caused extensive damage to residential properties, water infrastructure, and sanitation facilities. These promote the transmission of waterborne illnesses in the aftermath of a disaster. In recent years, the extreme, unpredictable, and unpredictable characteristics of flash floods have posed a challenge to their historical adaptation process. The most frequent occurrence of this type of flood is the North-Eastern flood of 2022, which has displaced millions in Sylhet and Sunamganj and left them without food, power, and potable water. It is without a doubt one of the worst flash floods in this region's history. By conducting a thorough analysis of the consequences of catastrophic flash floods in Barak Valley, Assam, and North-East Bangladesh, this report endeavors to integrate the unique narratives that have emerged from these two distinct regions of South Asia, which are geographically distant but share common experiences. The report places particular emphasis on the concept of intersectionality. In contrast to the Assam study, which aimed to evaluate the effects of recent floods on families in Barak Valley, North-East Bangladesh, an action research study was conducted to comprehend the gendered and intersectional ramifications of the flash flood.

The Department of Social Work at Assam University Silchar conducted the Assam portion of the study, which serves as the report's foundation, and it examines the complexities of the recent floods in Barak Valley. The principal aim was to gain a comprehensive understanding of the effects on families that were impacted, with particular attention given to the hardships

faced on a daily basis, the background of the family, and the role of government assistance. In order to achieve the objective of furnishing a comprehensive synopsis, sixteen families, constituting ten percent of the study's total population, participated in the survey. The conversations that were held with these families provided invaluable knowledge regarding the magnitude of the difficulties they faced and the advantages they obtained. An overarching goal of the study was to investigate the ways in which the inhabitants of the valley adapted to life after the floods, taking into consideration the complex interplay between gender, socioeconomic status, and cultural circumstances.

Concurrently, the Sunamganj component of the research, presented as an action research endeavor, explored the wider North-East Bangladesh region. In addition to examining the consequences of the recent flood, the study sought to investigate the difficulties and requirements of the intersectional community. The initiative aimed to provide actionable suggestions for both the immediate and extended term, with the intention of incorporating them into current policies and procedures. This methodology is consistent with the overarching objective of cultivating resilience in communities impacted by flash floods. The study aimed to accomplish the following: assess the comprehensive socioeconomic ramifications and losses experienced by communities as a result of the recent flash flood; evaluate the effects of the flood on sectors using a broad perspective; and support policy advocacy efforts that promote a preparedness, response, and recovery plan for South Asia in the face of flash floods that is more attuned to gender considerations.

Through the integration of these two elementsThe report aims to provide a detailed and thoughtful look at how flash floods affect different groups of people, focusing on gender and intersectionality.

In the Assam section, we explore the experiences of families in Barak Valley after a flood. This helps us understand their daily challenges and how the public views flash floods, especially through the lens of intersectionality.

The Sunamganj section, our secondary case study, goes further by not only examining the recent flood's impact but also placing it within a broader context. We investigate how different groups respond to flash floods and the specific difficulties they face in recovering from such disasters.

The convergence of these two studies acknowledges the common obstacles encountered by communities in various geographical areas, thus strengthening the argument that the effects of disasters extend beyond national borders. The report aims to make meaningful comparisons to improve our understanding of coping mechanisms, vulnerabilities, and adaptive strategies. This knowledge can then be used to guide comprehensive disaster resilience initiatives in the region.

## 1.4 Rationale behind the Merged Study Report

Practical considerations compelled the consolidation of findings from Assam, India, and Sunamganj, Bangladesh—as two distinct cases from two particular regions into a single report in order to address the consequences of catastrophic flash floods in both areas. The main emphasis of the investigation was on Sunamganj, where a group of undergraduates affiliated with the Institute of Disaster Management and Vulnerability Studies (IDMVS) performed practical evaluations in support of the Bangladesh initiative of GRRIPP South Asia.

However, as a result of time constrains and difficulties in gathering data, it was not feasible to perform an exhaustive statistical analysis for Sunamganj. The Department of Social Work at Assam University in Silchar endeavored to conduct further investigation into the repercussions of flash floods in Assam, India, with a specific focus on the Barak Valley region. The present study intentionally prioritized thorough analysis and extensive data collection.

The justification for the consolidation of these two geographically separate regions is rooted in the common attributes that are evident in the consequences of flash floods. Notwithstanding their geographical separation, the repercussions on localities and the susceptibilities encountered by impacted communities in Sunamganj and Assam were strikingly comparable. By combining the two regions into a single report, a comparative analysis is possible, which strengthens the foundation for comprehending the intersectional and gendered aspects of flash floods.

The main dataset utilized in this analysis is sourced from a comprehensive study carried out in Assam; however, the incorporation of Sunamganj further enhances the overall narrative. The rationale for the merger is based on the recognition that the flash flood scenario affected various communities in a comparable manner, irrespective of national boundaries. This strategy is consistent with GRRIPP South Asia's overarching objective, which prioritizes regional cooperation and the exchange of knowledge in order to bolster resilience to disasters.

The objective is to offer a comprehensive comprehension of the diverse socio-economic, cultural, and environmental elements that are in operation. The inclusion of an extensive examination of Assam in the report enhances its comprehensiveness by permitting a more profound dive into coping mechanisms, vulnerabilities, and adaptive strategies that emerged in the aftermath of flash floods.

## 2. Objective of the Study

### 2.1 Broad Objective

In order to conduct a thorough examination of the effects of flash floods on the local populations of Sunamganj, Sylhet, Bangladesh, and Barak Valley, Assam, India, this study will specifically concentrate on intersectionality, which encompasses a range of social, economic, and gender-related aspects.

### 2.2 Specific Objectives:

1. Investigate the early warning systems and preparedness measures adopted by the residents of Barak Valley, Assam, and Sunamganj, Sylhet, considering the intersecting factors of gender, socio-economic status, and other relevant dimensions.

2. Examine the economic consequences and changes in livelihood patterns resulting from flood occurrences in Barak Valley, Assam, and Sunamganj, Sylhet, with a focus on intersectional impacts, particularly how gender, age, and socio-economic factors intersect to shape vulnerabilities.

3. Evaluate the perceptions of residents in Barak Valley, Assam, and Sunamganj, Sylhet, regarding the frequency, severity, and implications of flash floods, exploring how these perceptions vary across different social groups and intersections.

4. Analyze the sector-wise impacts of flash floods through an intersectional lens, considering the differential effects on women, men, girls, boys, and gender-diverse groups in Barak Valley and Sunamganj.

5. Assess the health-related consequences and challenges faced by the population in Barak Valley, Assam, and Sunamganj, Sylhet, due to recurrent flash floods, with a specific emphasis on intersectional vulnerabilities.

6. Understand the coping mechanisms, perceptions, and responses of residents in Barak Valley, Assam, and Sunamganj, Sylhet, during and after flash flood events, exploring how intersectionality influences adaptive strategies and resilience.

## 3. A Brief Literature Review

### 3.1 Dynamics of Flood Occurrence and Impact

#### 3.1.1 Causes of Floods

Floods, as emphasised by Nott (2006), arise from a wide range of factors, including both natural and anthropogenic influences. In conjunction with anthropogenic factors such as deforestation and urbanisation, physical forces such as climatology contribute to the

occurrence of flooding. Climate-related factors, particularly extended periods of precipitation, become the primary determinant on a global scale, frequently persisting for days, weeks, or even months. Run-off is exacerbated by alterations in land use, specifically deforestation, which reduces the capacity of channels by increasing sedimentation rates.

Borrows and De Bruin (2006) emphasise the significant impact of flooding as a natural disaster, surpassing other perils in terms of both human casualties and economic devastation. The period spanning from 1986 to 1995 was marked by floods, which were responsible for 31% of worldwide economic losses and 55% of casualties. In light of the increasing peril, Carey (2005) contends that human populations across the globe continue to be susceptible to natural calamities. In determining the extent to which such catastrophes affect homes and livelihoods, geographic location and income levels are crucial factors.

### 3.1.2 Vulnerability and Impacts

According to Nott (2006), a flood event is classified as a natural hazard when it poses an immediate risk to human life or property. Low-lying floodplains, coastal areas, deltas, and small basins that are prone to flash floods are characterised as the most susceptible landscapes. In regions with a high human population density, floods are exacerbated into significant natural hazards.

Nott's analysis reveals a strong correlation between the depth and size of floodwaters and the direct consequences of flooding. Consequences include the duration required for crops and pastures to recover, as well as the economic and social disruption experienced by affected populations. Floods are one of the most expensive and pervasive natural perils, causing an estimated 50,000 fatalities each year and negatively impacting approximately 75 million individuals globally. Disease outbreaks frequently occur in the aftermath, especially in less developed nations, where malaria and typhoid become prevalent. Nott's estimations indicate that flood-affected regions in India and Bangladesh accommodate an estimated 300 million inhabitants.

### 3.1.3 Economic and Social Impact

According to a study by Known Risk (2005), the economic impact of natural disasters has increased significantly over the past several decades on a global scale. Developing communities are disproportionately impacted by this trend, which further amplifies their susceptibility and hinders both economic and social progress. Human lives are lost, social and economic infrastructure is devastated, and fragile ecosystems and social structures are degraded as a result of flooding. Social impacts are complex and interrelated, encompassing alterations in way of life, culture, community, political structures, environment, health, well-being, personal and property rights, fears, and aspirations. The aforementioned effects are closely intertwined with the welfare of individuals, communities, and society as a whole.

These aspects encompass elements such as education, literacy, access to human rights, good governance, social equity, traditional values, knowledge systems, customs, ideologies, and organizational systems as a whole (Living with Risk, 2002). Specific demographic groups, especially those who are less advantaged in society, are more susceptible to harm.

### 3.2 Flood from Global Perspectives

A report by the United Nations projects that more than fifty percent of the world's population will migrate from rural to urban areas within the next two decades. Nevertheless, local governments encounter obstacles when it comes to providing sufficient infrastructure, specifically drainage systems. Coastal regions are particularly susceptible to flash floods as a result of convergence of cyclones, storms, and tsunamis.

On a global scale, inundations result in devastation and loss of life. As per the World Disaster Report recently published by the International Federation of Red Cross and Red Crescent Societies (IFRC), during the period from 2008 to 2017, floods comprised the most significant proportion (41 percent) of documented catastrophes. A remarkable 730 million people have been affected, which exceeds one-third of the estimated 2 billion individuals impacted by natural disasters. Regarding economic consequences, floods have demonstrated greater devastation than any other category of catastrophe. India, which is recognised as one of the most severely impacted nations in Asia, is accountable for one-fifth of the worldwide fatalities caused by floods. Furthermore, twelve percent (40 million hectares) of its landmass is vulnerable to different types of flooding.

Brouwer et al. (2007) conducted an investigation into the vulnerability and preparedness of local communities in the Malaysian region with regards to floods. The researchers assessed the degree of flood exposure and the methods by which communities manage the harm caused by flooding. They emphasised that flooding was a significant contributor to income inequality and poverty in Bangladesh. A considerable number of scholars have devoted substantial endeavours to clarifying the ramifications of floods. A study was undertaken in Bangladesh in 2016 by Mohammad S. Huq, which focused on community-based disaster management. The primary emphasis was on the critical nature of community engagement in disaster management, the identification of obstacles, and the formulation of strategies to improve the welfare of individuals impacted in regions prone to disasters. The importance of community involvement in the sustainable management of natural disaster risks was emphasised. Bangladesh, due to its susceptibility to a multitude of natural perils including cyclones, floods, tornadoes, and earthquakes, confronts recurring obstacles that have significant consequences for both human lives and material assets. The research underscores the criticality of mitigating the adverse socio-economic consequences of such catastrophes via efficient strategizing, administration, and collaborative human engagement. Disaster management plans have been executed by the Bangladeshi government,

encompassing various initiatives such as shelter construction, institutional development, warning system establishment, awareness campaigns, and training programmes. This analysis examines the involvement of grassroots communities in disaster management in Bangladesh, utilising knowledge from prior scholarly works.

The regrettable occurrences predominantly impact developed countries, with significant consequences for the most developed and urbanised areas of the globe. Central America and Asia incurred significant economic losses amounting to USD 3.64 trillion between 1988 and 2000, which were ascribed to a combination of natural and anthropogenic catastrophes (Andrade and Szlafsztein, 2018).

Through case studies, Chang and Baiamonte (2002), Cannon (2004), Chen et al. (2015), Chakraborty and Joshi (2016), Canevari-Luzardo et al. (2017), and Vazire (2018) determined that flood hazard is the source of flood vulnerability. To generate flood hazard maps for rivers, numerous modelling approaches were modified, including the Hydrologic Engineering Centre (HEC-RAS) models. Critical in evaluations, these models were effectively implemented to assess flood vulnerability in areas prone to flooding, including the Columbia River, Warsaw, Texas, mid-eastern Dhaka, and others (Creach et al., 2016; Rehman et al., 2019).

Over the past decade, the United States, Bangladesh, Mozambique, Germany, India, China, and Malaysia have all been implicated in catastrophic incidents that have caused extensive damage to property and human lives (Alias et al., 2020). According to a study published in 2020 by Aroca-Jiménez et al., the hurricane Andrew in the United States caused losses of approximately $27 billion. This indicates that the hurricane caused substantial economic repercussions. When selecting the site for the incident, it is critical to consider the potential repercussions of flood damage on individuals. Densely populated urban regions are more susceptible to flooding, and the repercussions vary in perspective with regard to assets (Bajracharya et al., 2021).

### 3.3 Flooding in Bangladesh

Recurrent floods in Bangladesh are primarily caused by the country's topography and intense monsoon precipitation. Inundation results from overflow caused by drainage congestion, precipitation run-off, and storm-tidal surges; during the wet monsoon, this impacts around 30 to 35 percent of the total land area (Milliman et. al., 1989). Although typical floods are regarded as advantageous because they deposit alluvial silt, which is a crucial source of moisture and fertility for the soil, abnormal floods are considered catastrophic, especially during the peak flow seasons of July, August, and September.

The variability of flooding extents in Bangladesh has been documented in studies conducted by several authors (e.g., Choudhury and Hossain, 1981; Matin and Hussain, 1988; Pramanik,

1988; Rashid and Pramanik, 1990), wherein the affected land area ranged from 31% to 85% of the total landmass. Severe flooding transpired in 1997, 1988, 1998, and 2000, resulting in substantial damage to both human lives and property. An area of 81,831 square kilometers was inundated in 1988 alone.

Bangladesh is classified as a highly flood-prone nation, according to Brouwer et al. (2007), due to the fact that eighty percent of its land area is comprised of floodplains and numerous minor rivers. More than sixty percent of the nation was submerged in water as a result of catastrophic events, including those that occurred in 1988, 1998, and 2004, which caused social unrest and a lack of potable water due to contaminated surface water.

### 3.3.1 Vulnerability and Coping Mechanisms

An investigation conducted in Southeast Bangladesh in 2005 demonstrates a positive correlation among environmental risk, poverty, and vulnerability. Flooding is more likely to occur in impoverished areas situated in closer proximity to rivers; this correlation is established between income inequality, restricted access to natural resources, and environmental risk exposure (Brouwer, et al., 2007). In close proximity to rivers, households encounter diminished prospects for various economic endeavors, which increases their susceptibility to natural calamities and may potentially ensnare them in a cycle of poverty.

Notwithstanding the insurmountable scale of catastrophes, an accumulating body of evidence indicates that coping mechanisms have a substantial impact on outcomes (Smith, 2008). The 1998 floods were the most severe in the previous century, according to Rashid (2000); they inundated two-thirds of the nation, impacted millions of people, and required emergency food and health services. The floods, which raged for more than sixty-five days, ruined homes, crops, infrastructure, and means of subsistence. Women and children were identified as the most susceptible demographic groups amidst the catastrophes, as they encountered barriers in obtaining fundamental sanitation facilities. Food security was threatened by the severe damage to the rice crop caused by the 1998 floods; however, the impact on household access to food was mitigated with the assistance of government food transfers.

### 3.3.3 Population Growth, Climate Change, and Flood Risk

The literature emphasizes how the expanding global population exposes an increasing number of individuals and assets to the risks associated with flooding. Over the years, riverbank population growth in the study area has increased susceptibility. Given the projected intensification of flood impacts due to climate change, there exists a dearth of adequate and efficacious international interventions to curtail the escalating probability and repercussions of flooding. The effectiveness of flood risk management is dependent on the active participation of all parties affected by flooding. Flood risk appears to be on the rise,

according to the available evidence; therefore, continuous vigilance is required to maintain existing systems and implement enhancements. However, the adverse effects of flooding can be mitigated through the adoption of suitable behaviors and actions.

### 3.3.4 Gender and Intersectionality in Disaster Studies

The recurrent flash floods in the northeast indicate a notable deficiency in current research, specifically with regard to the susceptibility of particular demographic groups, such as women. Previous investigations by disaster researchers in Bangladesh have examined multiple facets of previous floods, such as the impact on marginal farmers and family food security, adaptive response strategies, and mortality reduction (Ahmad, 2019; Lindell and Perry, 2012). However, there is a significant research void concerning the vulnerability of vulnerable populations, including women, children, the elderly, and the disabled, in the context of frequent flash floods.

In disaster scenarios, women and other intersectional communities are frequently portrayed as helpless victims. On the contrary, Nasreen's (1995; 2012) groundbreaking research contends that women have the capacity to act as catalysts for transformation by participating in managerial, adaptable, and resilient endeavours that ensure the sustenance of their households. However, in the context of flash floods, the particular needs, constraints, and contributions of these intersectional communities are conspicuously neglected.

### 3.3.5 Challenges Faced by Vulnerable Groups

Existing literature emphasizes that households belonging to socially vulnerable or disadvantaged groups—such as the elderly, disabled, children, and women—are less prepared for disasters, which exposes them to more severe risks and repercussions. Within the remote rural regions of Bangladesh, women encounter an elevated state of susceptibility as a result of cultural conventions, economic disadvantage, and socially prescribed roles. Women are especially vulnerable during disasters due to gender disparities in social, political, and economic status, exposure to violence, and reproductive health, according to Nasreen (2012). During flash floods, the compromise that women are compelled to make with regard to cultural norms, such as the parda (purdah/veil), becomes an issue. The societal expectations that are mirrored in these compromises regarding women in the midst of disasters underscore the necessity for a more nuanced comprehension of gender dynamics in the context of disaster response and recovery.

Given the anticipated substantial escalation in flood risk in the forthcoming years as a result of climate change and ongoing socio-economic progress, it is imperative that disaster studies address the intersectionality and gender dimensions. The extant body of literature recognizes the adverse effects that floods have on individuals; however, there is considerable variation in the documentation regarding the enduring consequences for communities,

specifically in the socio-economic domain. The review indicates that a more thorough and consistent methodology is required to comprehend the multifaceted consequences of floods, particularly when examined from the perspectives of gender and intersectionality.

## 3.4 Flooding in India: The Case of Assam

### 3.4.1. Causes of Flooding in Assam

Together with anthropogenic factors and intense monsoon precipitation in the catchments of the Patkai and Himalayan hills, these elements pose a significant threat to Assam. Each year, this phenomenon leads to widespread inundation throughout the state, completely submerging large regions in the valley for a prolonged period of time. The ensuing devastation encompasses extensive crop damage, damage to both public and private property, and severe disruptions to vital communication infrastructure both within the state and in neighboring areas (Gogoi, 2016).

### 3.4.2. Floods in Assam: Causes and Diverse Human and Socioeconomic Impacts

Gogoi's (2016) research titled "Flood Disaster in Assam: Socio-economic Vulnerability and Control Measures" provides valuable insights into the significant socio-economic disruptions that occur as a result of recurrent floods. The annual devastation caused by the confluence of river erosion and flooding affects crops, human lives, and diverse means of subsistence. To tackle these challenges, it is imperative to implement efficient natural resource management practices that restrict damages to public and private infrastructure and property. The research highlights the significant importance of flood management and mitigation tactics, emphasizing the difficulties that are encountered at the state level.

The study "Floods in Assam: Measures and Threats" by Deka (2015) identifies drainage congestion, excessive rainfall, seismicity, landslides, and riverbank encroachment as the primary causes of flooding in Assam. The ramifications transcend monetary losses and have a profound impact on both the social and economic dimensions of individuals' existence. Along riverbanks, waterborne diseases become pervasive, and human settlements are perpetually exposed to danger. This segment examines the ramifications of floods on human beings, with a particular focus on the complex array of difficulties faced by the inhabitants of regions susceptible to flooding.

In their research titled "Flood Disaster in Assam," Debbarma and Deen (2020) reached the conclusion that the yearly flood incidents in the region of Assam exert a socio-economic influence, resulting in annual disruptions. Rural regions are notably impacted by floods, particularly those situated in close proximity to the Brahmaputra and Barak Valleys, according to an exhaustive examination of the records. The occurrence of annual floods in Assam, precipitation that exceeds average levels, and bank erosion present significant risks

to the local population, agricultural produce, and infrastructure. This study emphasizes the economic repercussions experienced by rural residents, specifically those employed in the agricultural industry. Moreover, it underscores the significant obstacles encountered in the comprehensive progress of the state. Despite the recurrent nature of monsoon season flooding, the central and state authorities tasked with flood control and mitigation have yet to establish sustainable and efficacious strategies. The well-being of future generations is contingent upon the prompt and appropriate action taken by both central and state authorities in response to the flooding situation in Assam. Neglecting to do so could potentially lead to future occurrences of flooding, thereby emphasizing the critical nature of proactive measures that beseech governing bodies.

### 3.4.3 Barak Valley of Assam: Geography, River Dynamics, and Flooding

Barak Valley comprises the municipalities of Hailakandi, Cachar, and Karimganj; the divisional office is situated in Silchar, which is home to a population of 3,612,581. Located 85 kilometers within the state of Assam, the high hill complex east of Mao and southeast of Japvo Peak is the source of Barak, the second-largest river in the state. Prominent tributaries situated on the left bank are Rukni, Katakhal, and Dhaleswari, while on the right bank are Labak, Madhura, and Dalu.

Silchar was struck by severe urban flooding in June and July 2022, according to NDRF (National Disaster Relief Force) officials, which was one of the worst incidents in India. Assam State Disaster Management Authority (ASDMA) data indicates that 1,658 individuals have been compelled to seek refuge in relief camps due to the floods. Several governmental entities, such as the district administration, SDRF, Fire and Emergency Services, and IAF, are conducting rescue operations in the seven districts of Assam that have been impacted, with an estimated 57,000 people affected.

The report emphasizes that districts such as Lakhimpur, Dibrugarh, Dhemaji, Sonitpur, Nagaon, Morigaon, Nalbari, and Barpeta have been significantly affected by the collapse of embankments. Furthermore, the Barak River, which has its source in Nagaland, flows for an estimated duration of 400 kilometers through the Manipur hills prior to traversing the Cachar plain in Assam for an estimated 130 kilometers before ultimately reaching Bangladesh. Elevated river flows, intense plain precipitation, and disruption of natural drainage caused by infrastructure such as railways and roads are the principal contributors to flooding in the state.

In summary, the comprehensive examination of the scholarly literature highlights the complex interplay between floods and their varied consequences, specifically in areas prone to flooding such as Bangladesh and Assam. The frequent incidence of floods, which is impacted by both climate change and human activities, emphasizes the urgent requirement for flood management strategies that are resilient in nature. The scholarly literature sheds

light on the significant socio-economic upheavals that result from floods. These disruptions not only cause immediate destruction to property and infrastructure, but also impact vulnerable populations, including women, children, and the elderly. Research conducted on Bangladesh highlights the intricate relationship among environmental risk, poverty, and vulnerability, with a particular emphasis on implementing focused interventions that cater to the needs of various segments of the population. Furthermore, the scholarly literature emphasizes the critical importance of proficient flood risk management, which requires a comprehensive strategy that takes into account geographical, socioeconomic, and cultural elements. The 1998 floods in Bangladesh emphasize the need for gender-sensitive response strategies by bringing to light the vulnerability of women during disasters. The case of Assam serves to underscore the notion that floods are not one-time occurrences, but rather persistent obstacles to socio-economic progress, demanding enduring strategies such as infrastructure development and resource management to tackle their underlying causes. As we traverse these intricacies, it becomes apparent that flood management necessitates collaborative endeavors from governmental bodies, international organizations, and local communities. Understanding the flood challenges requires a foundation in this literature review, which emphasizes the critical nature of implementing proactive and sustainable strategies to mitigate the detrimental effects on Bangladesh and Assam.

## 4 Methodology

### 4.1 Study Area

This narrative study based on Rapid Action Research was conducted in three severely affected villages of Shantigonj Upazila, Sunamganj district, Sylhet division, Bangladesh. Eight unions in Shantigonj are affected by the flash flood. This study included visits to two villages of Joykalash Union, Sultanpur (ward-3) and Dungria (ward-5), and one village of Paschimpagla Union, Kadipur (ward-3). The selection of these two villages is based on the fact that they are haor-side villages with a significant number of distinct economic and subsistence groups. The most recent flash flood directly affected all three villages. Additionally, accessibility in the study area was a major factor in this selection. This part representing as Case A. After that another robust action research was carried out in the most vulnerable flood affected areas of Cachar district, Assam, India. Altogether, 15 flood affected communities of the valley were identified purposively with the help of the government officials. This part representing as Case B.

*Table 1: Study details*

| Aspect | Study A: Shantigonj Upazila, Bangladesh | Study B: Cachar District, Assam | Comment |
|---|---|---|---|
| Study Design | Narrative study based on action research. | Descriptive study with mixed methods. | Study A focuses on narrative action research, while Study B employs a descriptive design with both quantitative and qualitative approaches. |
| Geographical Location | Three villages in Shantigonj Upazila, severely affected by flash floods. | 15 flood-affected communities in Cachar district. | Both studies are conducted in flood-affected areas, but Study B covers a broader range with 15 communities. |
| Sampling Design | Visits to villages in two unions based on economic diversity and flood impact. | Purposive identification of 15 communities. | Study A selects villages based on specific criteria, while Study Buses purposive selection of a larger number of communities. |
| Sampling Size | 300 individuals (156 male, 144 female). | Quantitative: 150 families; Qualitative: 16 families. | Study A has a larger overall sample size, but Study B differentiates between quantitative and qualitative samples. |
| Sampling Method and Technique | Selective random sampling (non-probability). | Quantitative: Non-probability and purposive sampling; Qualitative: Probability sampling. | Both studies use non-probability methods for quantitative data, but Study B also employs probability sampling for qualitative data. |
| Data Collection and Analysis | Semi-structured interviews with comprehensive questionnaire. | Primary and secondary data sources; quantitative data | Both studies use interviews, but Study B also incorporates secondary data and specific statistical software for analysis. |

| | | | |
|---|---|---|---|
| | | analyzed with SPSS-20. | |
| Inclusion Criteria | Individuals directly or partially affected by floods, no specific age range. | N/A in provided information. | Study A specifies its inclusion criteria, while Study B does not provide details on this aspect. |
| Ethical Issues, Privacy, and Confidentiality | Informed consent with emphasis on ethical considerations and data protection. | N/A in provided information. | Study A explicitly addresses ethical considerations and data protection, while Study B does not provide details on these aspects. |

## 4.2 Methods of Data Collection

The survey was carried out with the total sample of 300 (156 males and 144 females) to find out the affected populations in flood and other damages of the study areas. As for the sampling strategy, there was selective random sampling. Selectively randomized sampling is a non-probability sampling done by the researcher based on the target of the study so that the objective of the study can be fulfilled accordingly. The survey was conducted using a comprehensive questioner (appendix 01). After identifying the sample group, the enumerators collected data and information regarding the effects of flood and other damages on the sample group's livelihood through semi-structured interviews with each household. The data collection unit was every household among the sample. Observation and recording techniques were used to complete the interview and collect information about the effects of the flood on their livelihood. In another robust action research, a total of 150 families were covered for quantitative findings from the entire 15 selected localities. For qualitative findings (case studies) 16 families were chosen randomly by the researcher. Each community were covered by at least one case study. For quantitative study non-probability sampling method were followed and qualitative study followed probability sampling method. For quantitative data collection, initially multi stage sampling technique was done followed by purposive sampling technique. Qualitative data collection followed simple random sampling technique irrespective of age, gender, caste, religion and socio-economic status.

*Table 2: Study methods*

| Aspect | Study A: Shantigonj Upazila, Bangladesh | Study b: Cachar District, Assam | Comment |
|---|---|---|---|
| Study Design | Narrative study based on action research. | Descriptive study with mixed methods. | Study A focuses on narrative action research, while Study b employs a descriptive design with both quantitative and qualitative approaches. |
| Geographical Location | Three villages in Shantigonj Upazila, severely affected by flash floods. | 15 flood-affected communities in Cachar district. | Both studies are conducted in flood-affected areas, but Study b covers a broader range with 15 communities. |
| Sampling Design | Visits to villages in two unions based on economic diversity and flood impact. | Purposive identification of 15 communities. | Study A selects villages based on specific criteria, while Study b uses purposive selection of a larger number of communities. |
| Sampling Size | 300 individuals (156 male, 144 female). | Quantitative: 150 families; Qualitative: 16 families. | Study A has a larger overall sample size, but Study b differentiates between quantitative and qualitative samples. |
| Sampling Method and Technique | Selective random sampling (non-probability). | Quantitative: Non-probability and purposive sampling; Qualitative: Probability sampling. | Both studies use non-probability methods for quantitative data, but Study b also employs probability sampling for qualitative data. |
| Data Collection and Analysis | Semi-structured interviews with comprehensive questionnaire. | Primary and secondary data sources; quantitative data analyzed with SPSS-20. | Both studies use interviews, but Study b also incorporates secondary data and specific statistical software for analysis. |

| | | | |
|---|---|---|---|
| Inclusion Criteria | Individuals directly or partially affected by floods, no specific age range. | N/A in provided information. | Study A specifies its inclusion criteria, while Study b does not provide details on this aspect. |
| Ethical Issues, Privacy, and Confidentiality | Informed consent with emphasis on ethical considerations and data protection. | N/A in provided information. | Study A explicitly addresses ethical considerations and data protection, while Study b does not provide details on these aspects. |

## 4.3 Inclusion Criteria

Some inclusion criteria for collecting sample from population of the targeted area. That people who are the affected from the flood and associated factors of flood are included in this study. The age level of the sample was another important factor. It was considered that the age range was not determined. The people, who are directly or partially affected in the flood or its secondary effects, are included in this study.

## 4.4 Ethical Issues, Privacy and Confidentiality

Permission was taken from every volunteer participant by using the informal consent from all of him or her. At the beginning of data collection, the enumerators informed every participant about the ethical and confidential issues of this study. It was also informed that participant had right to refuse to answer any question of the research and also had the right to withdraw from any part of the research. All data of the research was used only for the research purpose and it was protected safely.

## 4.5 Data Analysis

While keeping the objectives in mind, data collection was done in both quantitative and qualitative mode.
For quantitative data collection, a set of interview schedules were prepared and a set of interview guide were prepared for case study. Here Bangladesh generated data (Case A) and India generated data (Case B) analysed separately. Because rapid action research to robust action research some changes in tools to achieving more rigorous outcome. Collected data were analysed in both tables and figures. Quantitative data were analysed using Statistical Package for Social Sciences, Version – 20 (SPSS-20).

## Chapter 5: Result and Findings

### Demographic Information: Flash Flood in North-East Bangladesh (Case A) and Barak Valley, Assam, India (Case B)

Here is outcome of the 2 cases of the research. Case A representing the North-East part of Bangladesh and Case B representing the Barak valley, Assam, India. Result is represented each section separately.

### 5:1 Demographic Information of North-East Bangladesh (Case A)

### Section A: Demographic Information (Case A)

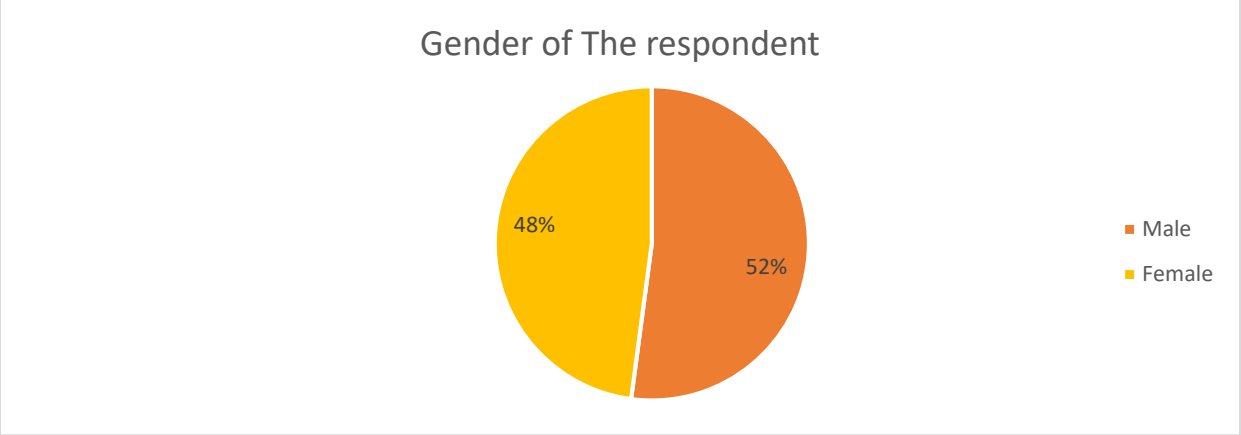


*Figure 1: Percentage distribution of respondents by Gender*

Gender is considered an essential demographic variable for quantitative research. The gender distribution in this study is about equal, with 52% of the participants being males and the remaining 48% being females. (See Table 1)

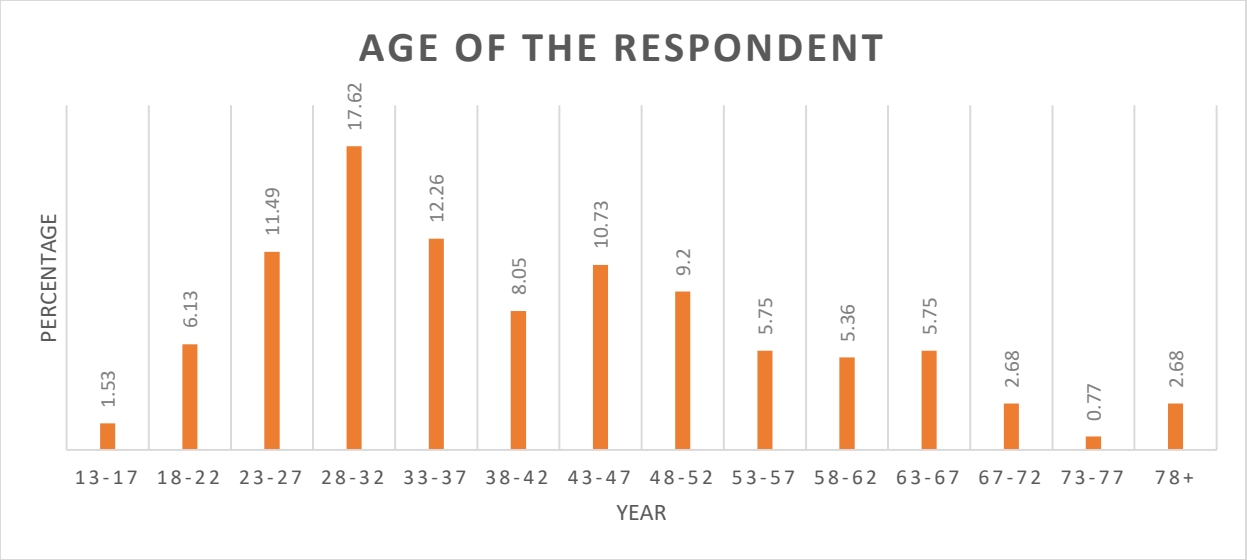


*Figure 2: Percentage distribution of respondents by age*

Almost 18% of the study's participants were between the ages of 28 and 32, as indicated by the participants' age distribution. 12 % of the respondents were between the ages of 33 and 37 years old, while a similar proportion was between the ages of 18 and 22. Around 27% of the respondents were between the ages of 38 and 52, while roughly 23% were older than 52. (See Table 2)

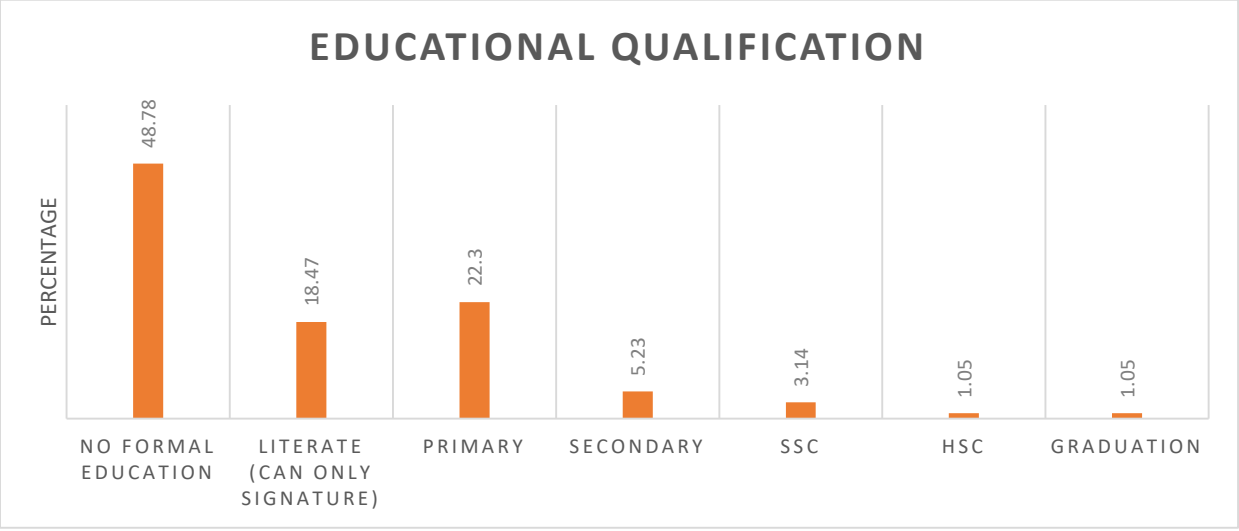


*Figure 3: Percentage distribution of respondents by educational qualifications*

The education rate in the flood-affected areas doesn't look good with nearly 50% of the participants of the study lacking any formal education. When asked about educational attainment, 18% of the respondents responded that they are literate on the basis that they

can sign their names on paper. Nonetheless, just over 20% of the respondents had finished primary school (classes 1 through 5), followed by 5% with secondary education. While about 3% of them held SSC certificates, little more than 1% earned HSC certificates. An insignificant proportion of respondents were found to have completed graduation. (See Table 3)

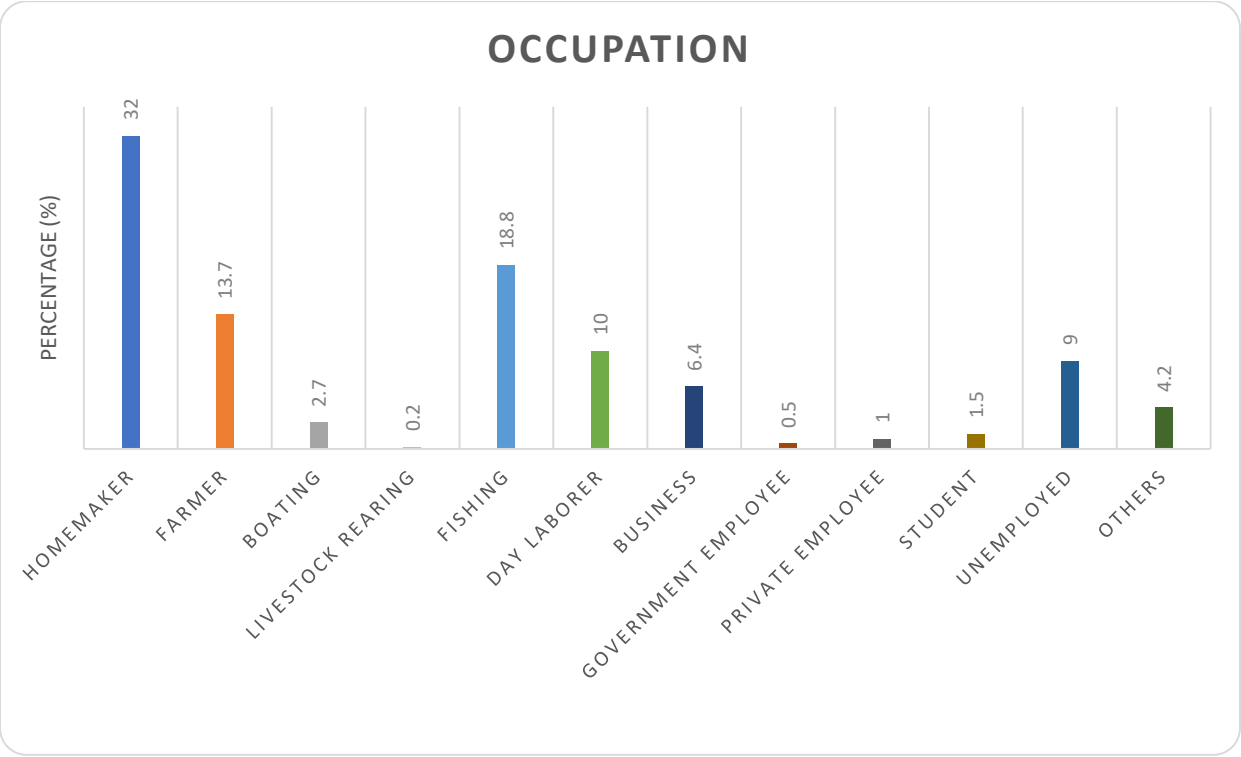


*Figure 4: Percentage distribution of respondents by occupation*

The study sought to gather demographic profiles of the respondents and it was observed that more than 30% of respondents were homemakers while nearly 15% said they rely on farming for their livelihoods. Approximately 19% of respondents were identified as fishermen, 10% as day labourers, and 6% as businesspeople. During the study, however, roughly 10% of respondents responded that they were unemployed. A negligible percentage of respondents engaged in boating, livestock farming, and government and private jobs. It turned out that several of the respondents were students as well. (See Table 4)

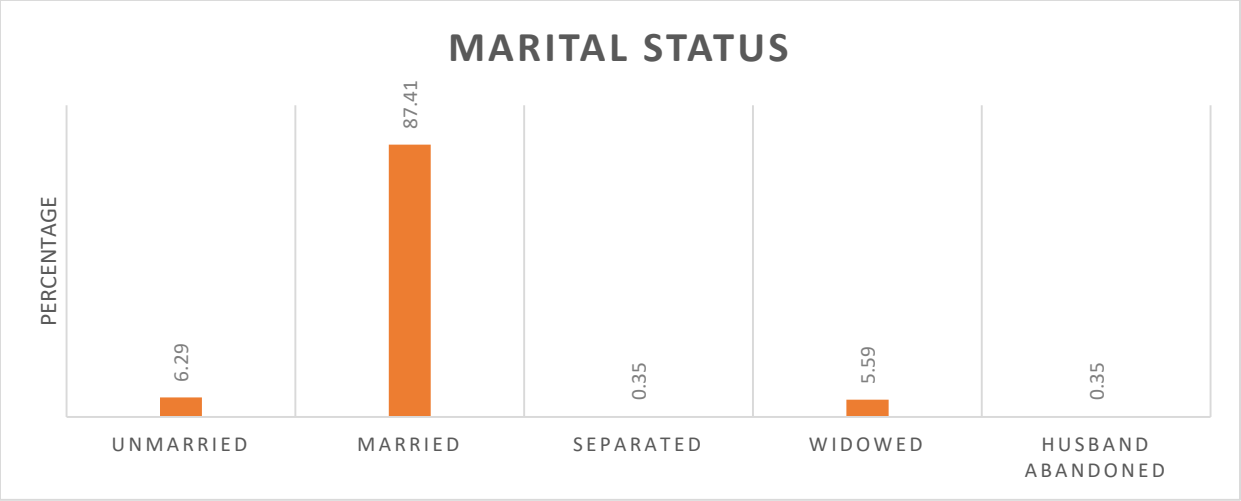


*Figure 5: Percentage distribution of respondents by marital status*

It is apparent from the findings that roughly 88% of the respondents were married, whereas only 6% were reported to be single. Moreover, 5% of the respondents were widowed. "Separated" and "abandoned by husbands" were also mentioned by a few of the respondents. (See Table 5)

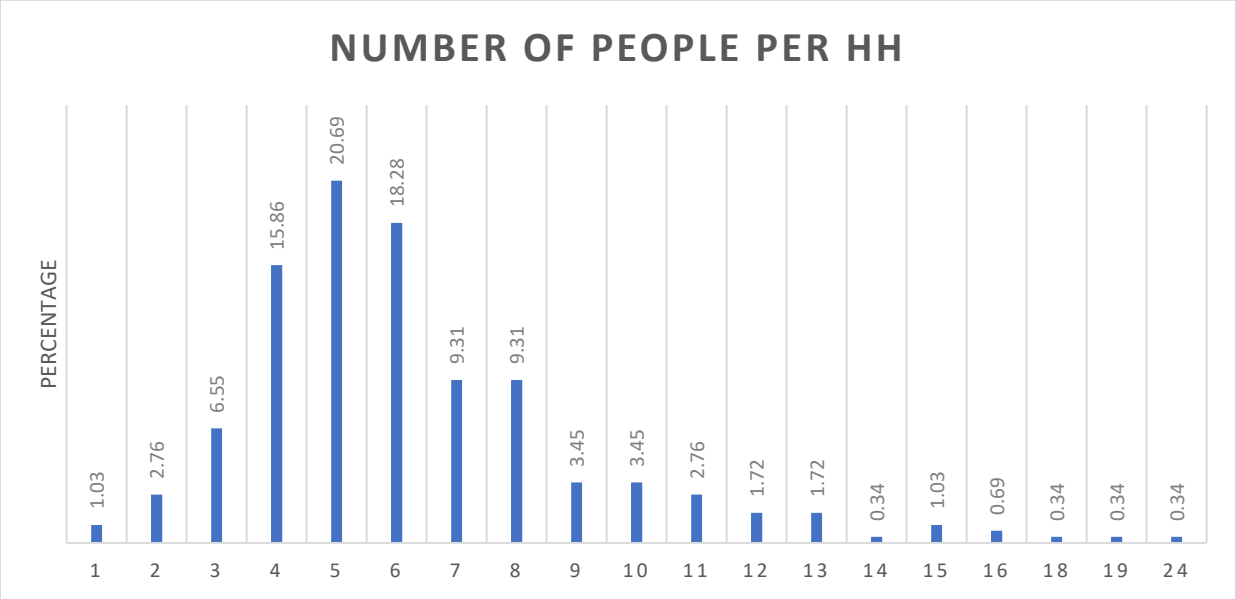


*Figure 6: Distribution of household size of the respondents*

The findings indicate that more than fifty percent of the participating households comprised of four to six persons. Over 20% of homes had seven to eight individuals, while 10% had nine

to eleven members. Slightly over 5% of all households had three individuals. Moreover, households with up to twenty-four people were identified as well. (See Table 6)

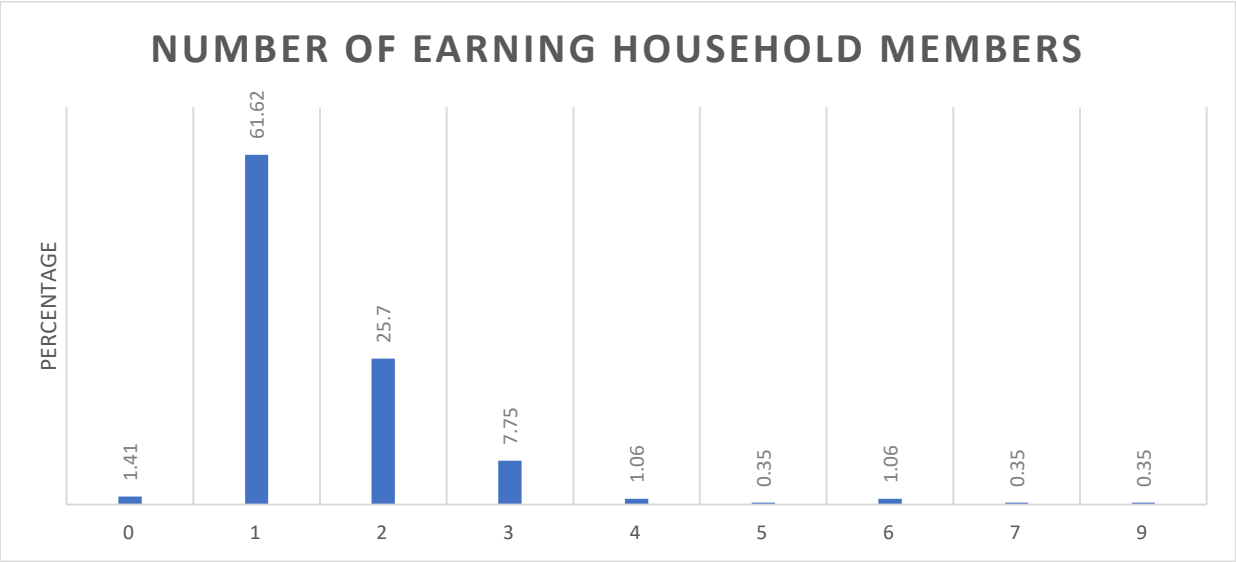


*Figure 7: Distribution of total earning members per household*

More than 60% of the households in the survey had only one earning member, whereas at least 25% of the households had two earning individuals. Fewer than 10% of those households had three earners. Few households had between four and nine earning members. (See Table 7)

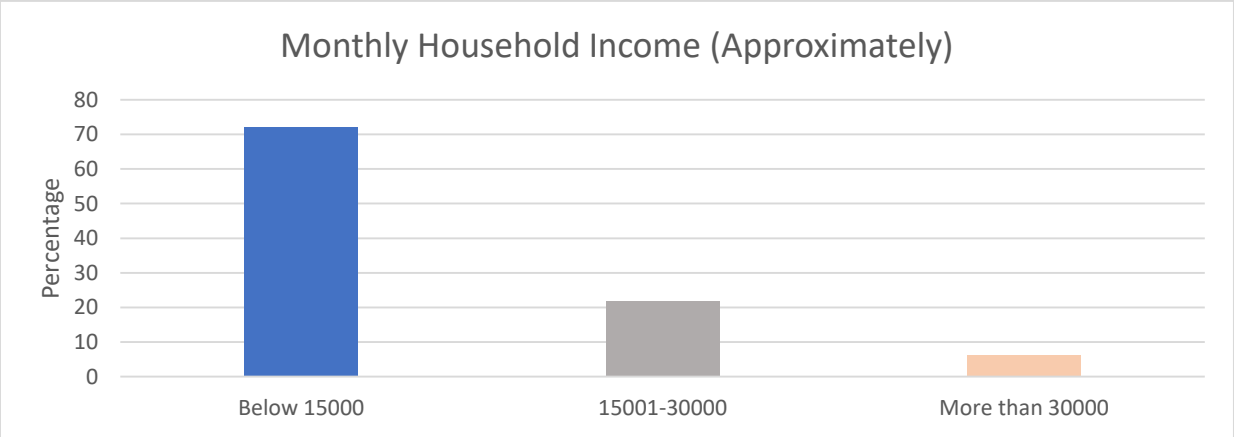


*Figure 8: Distribution of monthly household income of the respondents*

According to the data, more than 70% of the households earn below 15000 BDT a month which summarizes the economic condition of the flood-affected population. Just over 20% of the households have a monthly income of 15000 – 30000 BDT. Only a few households were identified with household income exceeding 30000 BDT. (See Table 8)

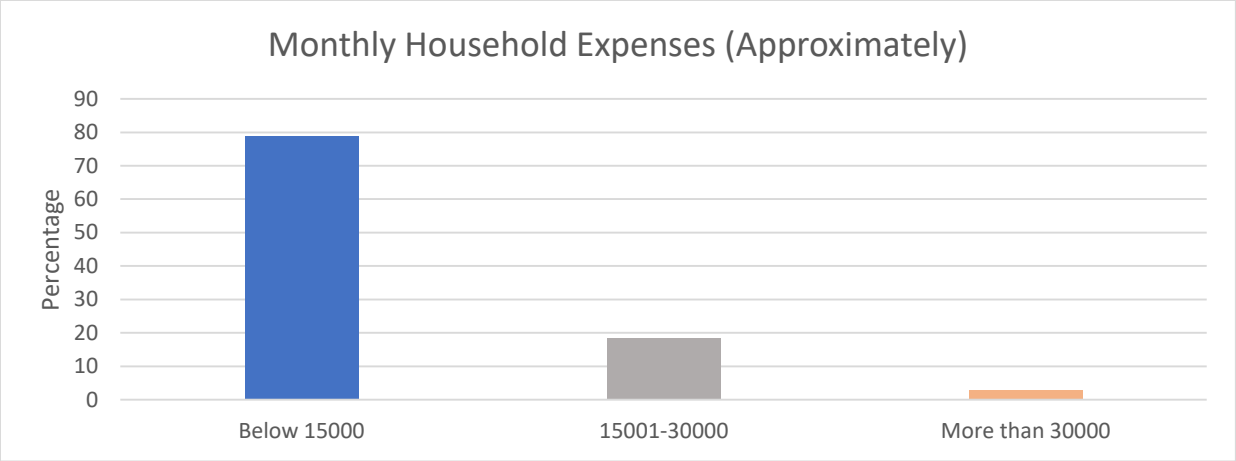


*Figure 9: Distribution of monthly household expenses of the respondents*

About 80% of households reported monthly household expenses below 15000 BDT, whereas 18% of respondents reported monthly household expenses between 15000 and 30000 BDT. Just 6% of households had expenditures in excess of 30000 BDT. (See Table 9)

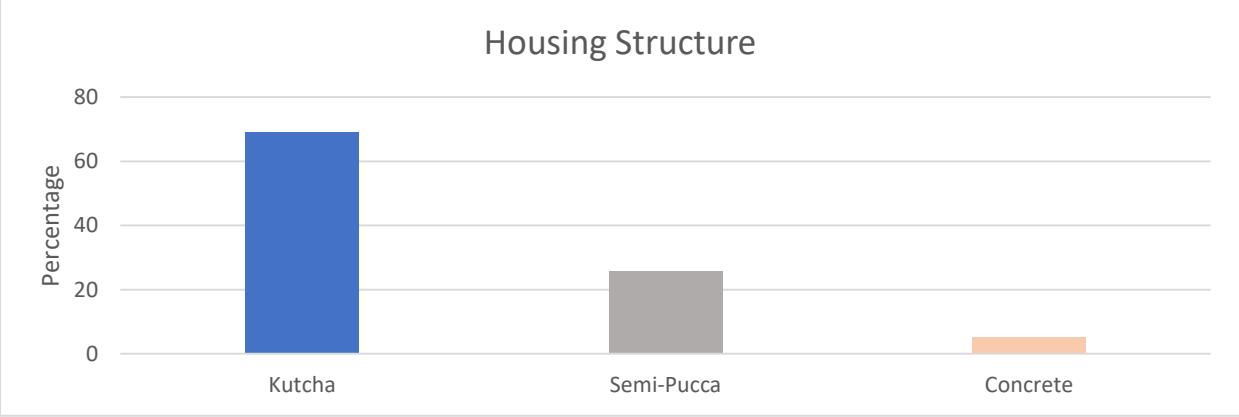


*Figure 10: Distribution of housing structures of the respondents*

Data indicate that kutcha houses were significantly more prevalent than any other type of dwelling in flood-affected regions. Nearly 70% of the respondents said they reside in kutcha houses. Semi-pucca houses were mentioned by at least 25% of the respondents while roughly 5% were found to be having a concrete house for themselves. (See Table 10)

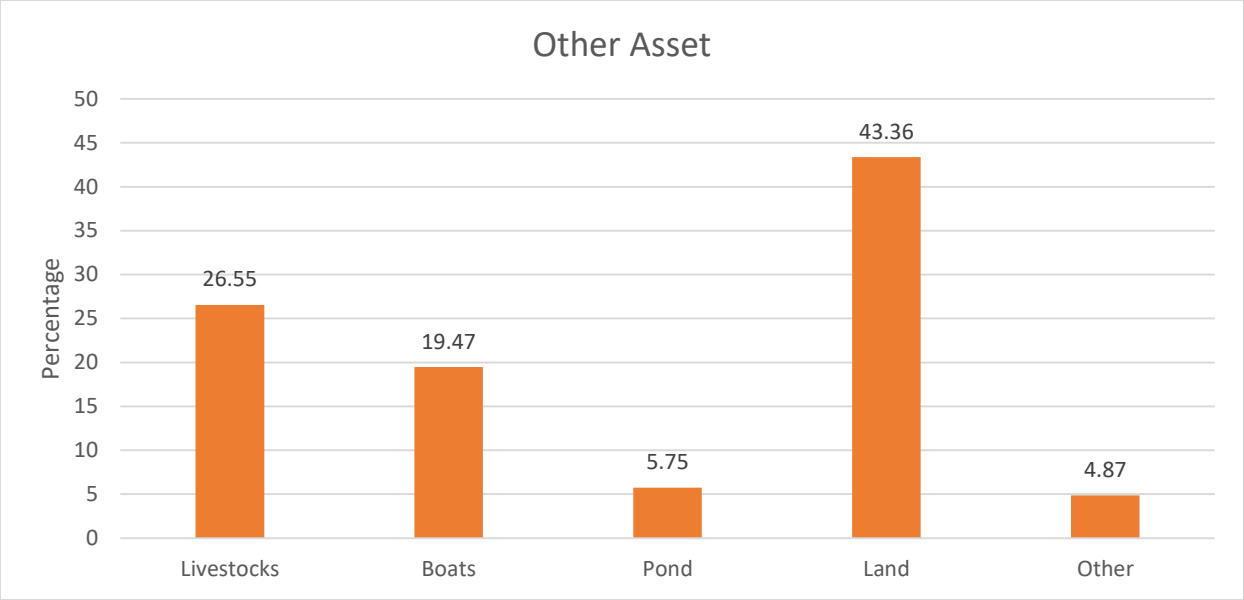


*Figure 11: Distribution of household assets of the respondents*

Land, livestock, boats, and ponds are the most frequent types of assets reported by study participants. At least 43% of the respondents possessed land area as an asset, and over 27% of them owned livestock. Approximately 20% of respondents indicated having boats, whereas 5% claimed to have ponds. A few other types of assets were also mentioned by some of the respondents. (See Table 11)

**Demographic Information of Barak Valley, Assam, India (Case B)**

## Section A: Demographic Information (Case B)

*Table 3: Table 1.1: Distribution of Gender for case B*

| Gender | No. of Respondents | Percentage (%) |
|---|---|---|
| Male | 94 | 62.7% |
| Female | 56 | 37.3% |
| **Total** | **150** | **100%** |

The above table (table 1.1) shows that majority of participants (n=94; 62.7%) were males followed by female participants (n=56; 37.3%).

*Table 4: Gender wise age-group distribution of the respondents for case B*

| Age group (Count % in column) | Gender | | Total (%) |
|---|---|---|---|
| | Male (%) | Female (%) | |
| Less than 18 Years | 01 (1.1%) | - | 01 (0.7%) |
| 18 – 29years | 10 (10.6%) | 10 (17.9%) | 20 (13.3%) |
| 30 – 39years | 12 (12.8%) | 10 (17.9%) | 22 (14.7%) |
| 40 – 49years | 20 (21.3%) | 08 (14.3%) | 28 (18.7%) |
| 50 – 59years | 23 (24.5%) | 10 (17.9%) | 33 (22.0%) |
| 60 – 69years | 13 (13.8%) | 08 (14.3%) | 21 (14.0%) |
| 70 & above years | 08 (8.5%) | 04 (7.1%) | 12 (8.0%) |
| Age not mentioned | 07 (7.4%) | 06 (10.7%) | 13 (8.7%) |
| **Grand Total** | **94 (100%)** | **56 (100%)** | **150 (100%)** |

The above table (table 1.2) shows that among males, most of the respondents (n=23; 24.5%) were in the age group of 50 – 59 years followed by other age groups. Among females, three age groups had equal numbers and percentage (n=10; 17.9%) and these age groups are 18 – 29 years, 30 – 39 years and 50 – 59 years followed by other age groups. Overall, 22.0% (n=33) of respondents were in middle age i.e., 50 – 59 years followed by other age groups. 8.7% (n=13) of respondents were not mentioned their chronological age.

*Table 5: Distribution of gender wise educational qualification of the respondents*

| Educational Qualification (Count % in column) | Gender | | Total (%) |
|---|---|---|---|
| | Male (%) | Female (%) | |
| No formal education | 06 (6.4%) | 04 (7.1%) | 10 (6.7%) |
| Literate | 21 (22.3%) | 10 (17.9%) | 31 (20.7%) |
| Primary | 14 (14.9%) | 16 (28.6%) | 30 (20.0%) |
| Secondary | 06 (6.4%) | 06 (10.7%) | 12 (8.0%) |
| SSC | - | - | - |
| HSC | 25 (26.6%) | 06 (10.7%) | 31 (20.7%) |
| Graduation | 22 (23.4%) | 14 (25.0%) | 36 (24.0%) |
| Others | - | - | - |
| **Grand Total** | **94 (100%)** | **56 (100%)** | **150 (100%)** |

The above table (table 1.3) shows that among males, more than a quarter (n=25; 26.6%) studied upto HSC followed by graduation (n=22; 23.4%), literate (n=21; 22.3%), primary (n=14; 14.9%), secondary (n=06; 6.4%) and no formal education (n=06; 6.4%). Among females, most of the respondents studied upto primary (n=16; 28.6%) followed by graduation (n=14; 25.0%), literate (n=10; 17.9%), HSC (n=06; 10.7%), secondary (n=06; 10.7%) and no formal education (n=04; 7.1%). Overall, most of the respondents were studied upto graduation (n=36; 24.0%) followed by HSC (n=31; 20.7%), literate (n=31; 20.7%), primary (n=30; 20.0%), secondary (n=12; 8.0%) and no formal education (n=10; 6.7%).

*Table 6: Distribution of occupation*

| Occupation | No. of respondents | Percentage (%) |
|---|---|---|
| Homemaker | 19 | 12.7% |
| Farmer | 03 | 2.0% |
| Fishing | 02 | 1.3% |
| Day labour | 35 | 23.3% |
| Business | 34 | 22.7% |
| Government employee | 19 | 12.7% |
| Private employee | 12 | 8.0% |
| Student | 08 | 5.3% |
| Unemployed | 12 | 8.0% |
| Others | 06 | 4.0% |
| **Total** | **150** | **100%** |

The above table (table 1.4) shows that most of the respondents were day labours (n=35; 23.3%) followed by business (n=34; 22.7%), government employee (n=19; 12.7%), homemaker (n=19; 12.7%), private employee (n=12; 8.0%), unemployed (n=12; 8.0%), student (n=08; 5.3%), others (n=06; 4.0%), farmer (n=03; 2.0%) and fishing profession (n=02; 1.3%).

*Table 7: Distribution of marital status*

| Marital Status | No. of respondents | Percentage (%) |
|---|---|---|
| Unmarried | 16 | 10.7% |
| Married | 120 | 80.0% |
| Widow/widowed | 12 | 8.0% |
| Divorced | 02 | 1.3% |
| **Total** | **150** | **100%** |

The above table (table 1.5) shows that majority of participants were married (n=120; 80.0%) followed by unmarried person (n=16; 10.7%), widow/widowed (n=12; 8.0%) and divorced (n=02; 1.3%).

*Table 8: Gender wise marital status of the respondents*

| Marital Status (Count % in column) | Gender | | Total (%) |
|---|---|---|---|
| | Male (%) | Female (%) | |
| Married | 86 (91.5%) | 34 (60.7%) | 120 (80.0%) |
| Unmarried | 08 (8.5%) | 08 (14.3%) | 16 (10.7%) |
| Widow/widowed | - | 12 (21.4%) | 12 (8.0%) |
| Divorced | - | 02 (3.56%) | 02 (1.3%) |
| **Grand Total** | **94 (100%)** | **56 (100%)** | **150 (100%)** |

The above table (table 1.6) shows that among males, majority (n=86; 91.5%) were married and 8.5% (n=08) were unmarried. Among females, majority of the respondents (n=34; 60.7%) were married followed by widow/widowed (n=12; 21.4%), unmarried (n=08; 14.3%) and divorced (n=02; 3.56%).

*Table 9: Distribution of household members*

| Household members | No. of respondents | Percentage (%) |
|---|---|---|
| Upto 5 members | 103 | 68.7% |
| 6 – 10 members | 42 | 28.0% |
| More than 10 members | 05 | 3.3% |
| **Total** | **150** | **100%** |

The above table (table 1.7) shows that majority of the respondents had upto 5 members in household (n=103; 68.7%) followed by 6 – 10 members (n=42; 28.0%) and more than 10 members (n=05; 3.3%). The lowest limit of household member was 01 and upper limit of household members was 17. Average member was 5.13.

*Table 10: Distribution of earning household members*

| Household earning members | No. of respondents | Percentage (%) |
|---|---|---|
| Only one earner | 90 | 60.0% |
| Two earning members | 44 | 29.3% |
| More than two earning members | 14 | 9.3% |
| Not mentioned | 02 | 1.3% |
| **Total** | **150** | **100%** |

The above table (table 1.8) shows that majority of the respondents had only one earning members in household (n=90; 60.0%) followed by two earning members (n=44; 29.3%), more than two earning members (n=14; 9.3%) and only two (1.3%) respondents were not mentioned information about earning members at home.

*Table 11: Distribution of monthly household income*

| Monthly household income | No. of respondents | Percentage (%) |
|---|---|---|
| Upto Rs. 5000/- | 09 | 6.0% |
| Rs. 5001/- to Rs. 10000/- | 41 | 27.3% |
| Rs. 10001/- to Rs. 15000/- | 36 | 24.0% |
| Rs. 15001/- to Rs. 20000/- | 18 | 12.0% |
| Rs. 20001/- to Rs. 25000/- | 06 | 4.0% |
| Rs. 25001/- to Rs. 30000/- | 22 | 14.7% |
| Rs. 30001/- to Rs. 35000/- | 04 | 2.7% |
| Rs. 35001/- to Rs. 40000/- | 05 | 3.3% |
| Rs. 40001/-& above | 08 | 5.3% |
| Not mentioned | 01 | 0.7% |
| **Total** | **150** | **100%** |

The above table (table 1.9) shows that most of the respondents earns monthly Rs. 5001/- to Rs. 10000/- (n=41; 27.3%) followed by Rs. 10001/- to Rs. 15000/- (n=36; 24.0%), Rs. 25001/- to Rs. 30000/- (n=22; 14.7%), Rs. 15001 to Rs. 20000/- (n=18; 12.0%), upto Rs.

5000/- (n=09; 6.0%), Rs. 40001 & above (n=08; 5.3%) and Rs. 20001 to Rs. 25000/- (n=06; 4.0%). Only one respondent (n=01; 0.7%) did not express monthly income. Lower and upper limit of monthly household income was respectively Rs. 2400/- and Rs. 80000/-. Average income was Rs. 18949.33/-.

*Table 12: Distribution of monthly household expenses*

| **Monthly household expenses** | **No. of respondents** | **Percentage (%)** |
|---|---|---|
| Upto Rs. 5000/- | 13 | 8.7% |
| Rs. 5001/- to Rs. 10000/- | 67 | 44.7% |
| Rs. 10001/- to Rs. 15000/- | 29 | 19.3% |
| Rs. 15001/- to Rs. 20000/- | 16 | 10.7% |
| Rs. 20001/- to Rs. 25000/- | 05 | 3.3% |
| Rs. 25001/- to Rs. 30000/- | 10 | 6.7% |
| Rs. 30001/- to Rs. 35000/- | 03 | 2.0% |
| Rs. 35001/- to Rs. 40000/- | 02 | 1.3% |
| Rs. 40001/- & above | 04 | 2.7% |
| Not mentioned | 01 | 0.7% |
| **Total** | **150** | **100%** |

The above table (table 1.10) shows that most of the respondent's expenses monthly Rs. 5001/- to Rs. 10000/- (n=67; 44.7%) followed by Rs. 10001/- to Rs. 15000/- (n=29; 19.3%), Rs. 15001/- to Rs. 20000/- (n=16; 10.7%), upto Rs. 5001/- (n=13; 8.7%), Rs. 25001/- to Rs. 30000/- (n=10; 6.7%), Rs. 20001/- to Rs. 25000/- (n=05; 3.3%), Rs. 40001 & above (n=04; 2.7%), Rs. 30001/- to Rs. 35000/- (n=03; 2.0%) and Rs. 35001 to Rs. 40000/- (n=02; 1.3%). Only one respondent (n=01; 0.7%) did not express monthly household expenditure. Lower and upper limit of monthly household expense was respectively Rs. 3000/- and Rs. 70000/-. Average expense was Rs. 14803.33/-.

The below mentioned graph/figure (graph/figure 1.1) shows that most of the respondents were residing in concrete house (n=72; 48.0%) followed by kacha house (n=44; 29.3%) and semi-paka house (n=34; 22.7%).

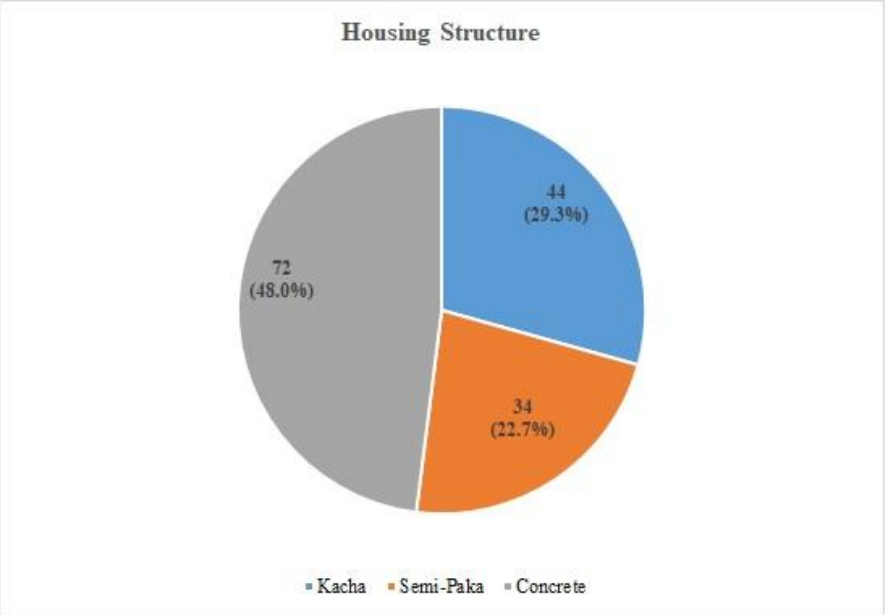


*Figure 12: Distribution of housing structure of respondent*

*Table 13: Distribution of other assets*

| **Type of Assets** | **No. of respondents** | **Percentage (%)** |
|---|---|---|
| Land | 66 | 44.0% |
| Others | 53 | 35.3% |
| Pond & Land | 02 | 1.3% |
| Livestock and land | 02 | 1.3% |
| Land & autorickshaw | 03 | 2.0% |
| Cycle | 01 | 0.7% |
| Land & vehicle | 03 | 2.0% |
| Not mentioned | 20 | 13.3% |
| **Total** | **150** | **100%** |

The above table (table 1.11) shows that most of the respondents (n=66; 44.0%) had their own land followed by other different types of assets in their household.

*Table 14: Distribution of other assets*

| Demographic Aspect | Case A: North-East Bangladesh | Case B: Barak Valley, Assam, India | Comments |
|---|---|---|---|
| Gender Distribution | 52% male, 48% female | 62.7% male, 37.3% female | Case B has a higher proportion of male respondents. |
| Age Distribution | Varied, with significant groups in 28-52 age range | Majority in the 50-59 age range, varied distribution in other age groups | Case A has a broader distribution, while Case B has a concentration in the 50-59 age group. |
| Educational Qualifications | 50% lack formal education, small percentages with higher education | More balanced educational distribution, with a significant number at higher education levels | Case B shows a higher educational attainment among respondents. |
| Occupation | 30% homemakers, diverse occupations including farming and fishing | Majority are day laborers and in business, diverse other occupations | Case B shows a higher proportion in day labor and business. |
| Marital Status | 88% married, other statuses present | 80% married, varied other statuses | Both cases have a high proportion of married respondents, slightly higher in Case A. |
| Household Size | Majority 4-6 members, up to 24 members | Majority up to 5 members, up to 17 members | Case A tends to have larger households. |
| Earning Members per Household | Majority one earning member, up to nine earners | Majority one earner, up to two earners | Case A has a wider range of earning members per household. |
| Monthly Household Income | 70% earn below 15000 BDT | More varied income distribution, with significant groups in various income ranges | Case B shows a broader income distribution. |
| Monthly Household Expenses | 80% below 15000 BDT | Majority between Rs. 5001/- to Rs. 10000/- | Case B has a broader range of expenses. |
| Housing Structure | 70% in kutcha houses | Majority in concrete houses | Housing structure in Case B is more developed. |
| Household Assets | Land, livestock, boats, and ponds as common assets | Land is the most common asset, followed by other types | Land is a significant asset in both cases, with more variety in Case B. |

## Overview of demographic Information: Flash Flood in North-East Bangladesh (Part A) and Barak Valley, Assam, India (Part B)

*Table 15: Over view of demographic Information*

| Category | Figure | North-East Bangladesh (Percentage) | Table/ Figure | Barak Valley, Assam, India (Percentage) |
|---|---|---|---|---|
| **Gender** | Figure 1 | 52% Males, 48% Females | Table 1.1 | 63% Males, 37% Females |
| **Age** | Figure 2 | Varied age groups distribution | Table 1.2 | Detailed age group distribution |
| **Education** | Figure 3 | 50% No formal education | Table 1.3 | Diverse educational qualifications |
| **Occupation** | Figure 4 | 30% Homemakers, 15% Farmers | Table 1.4 | Predominantly day laborers and business |
| **Marital Status** | Figure 5 | 88% Married, 6% Single | Table 1.5 | 80% Married, 11% Unmarried |
| **Household Size** | Figure 6 | Varied household sizes | Table 1.7 | Majority have up to 5 members |
| **Earning Members** | Figure 7 | 60% One earner, 25% Two earners | Table 1.8 | 60% One earner, 29% Two earners |
| **Monthly Income** | Figure 8 | 70% Below 15000 BDT | Table 1.9 | Varied income distribution |
| **Monthly Expenses** | Figure 9 | 80% Below 15000 BDT | Table 1.10 | Varied expenditure distribution |
| **Housing Structures** | Figure 10 | Predominantly kutcha houses | Figure 1.1 | Predominantly concrete houses |
| **Household Assets** | Figure 11 | Land, Livestock, Boats, Ponds | Table 1.11 | Land is the most prevalent asset |

This side-by-side comparison provides an overview of the sociodemographic characteristics in the two flood-affected regions. While some similarities exist, such as the predominance of one-earner households, there are notable differences in education levels, housing structures, and the distribution of household assets. This information can help identify specific vulnerabilities and inform targeted interventions in each region.

## Findings from North-East Bangladesh (Case A)

Below all that information's are from generated by Case A.

### Section B: Perception of Flash Flood (Case A)

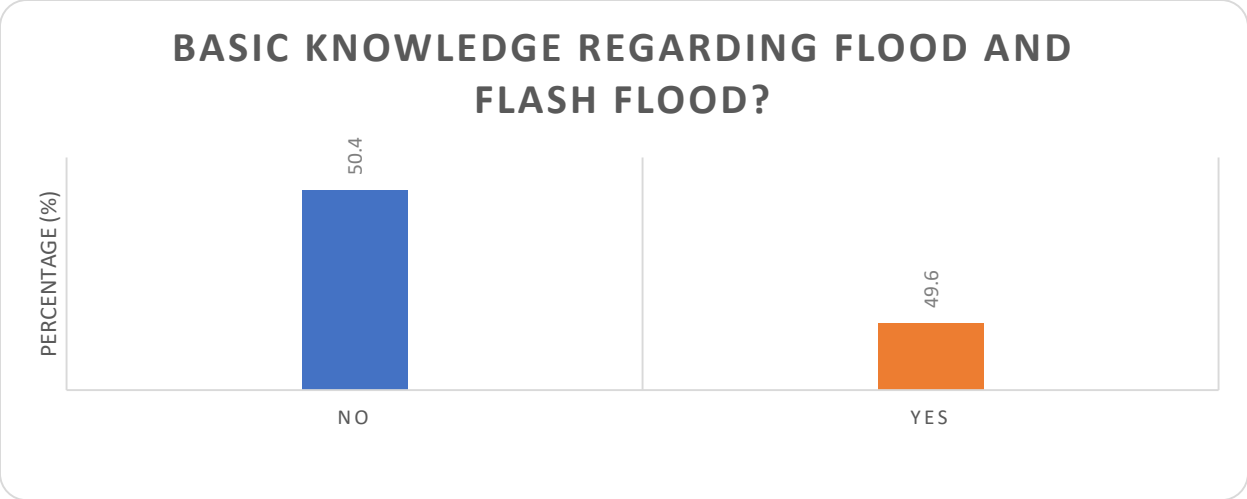


*Table 16:Perentage distribution of respondents' basic knowledge regarding floods and flash floods*

There was a total of 262 responses to the question indicating a basic understanding of flooding and flash flooding. More than half of the respondents lacked knowledge about floods and flash floods, which is alarming given that they live in a region that is highly susceptible to flooding. About 49.6% of the respondents replied in the affirmative and stated that they have a basic understanding of the phenomena. (See Table 12)

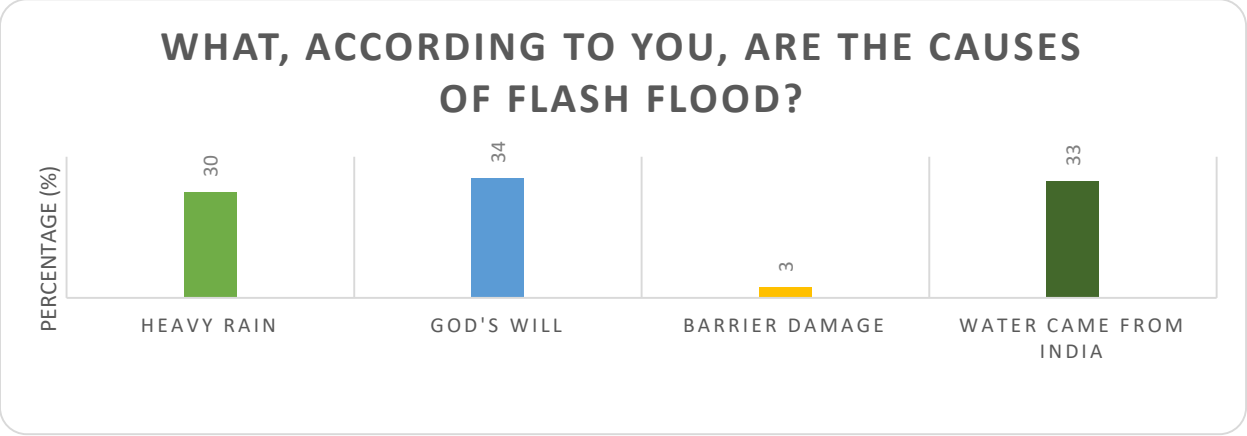


*Table 17: Respondents' perception regarding the causes of flash floods*

Among the 209 respondents who shared their views on the causes of the recent flood, almost 34 percent of them attributed the incident the will of God while another 33% of respondents believed that water coming down from upstream India caused the flash flood. In addition, 30% of respondents stated heavy rainfall as the leading cause of the 2022 flood. And only a small percentage of respondents, roughly 3%, reported that the flash flood was a direct result of damaged barriers. (See Table 13)

## Section B: Perception of Flash Flood (Case B)

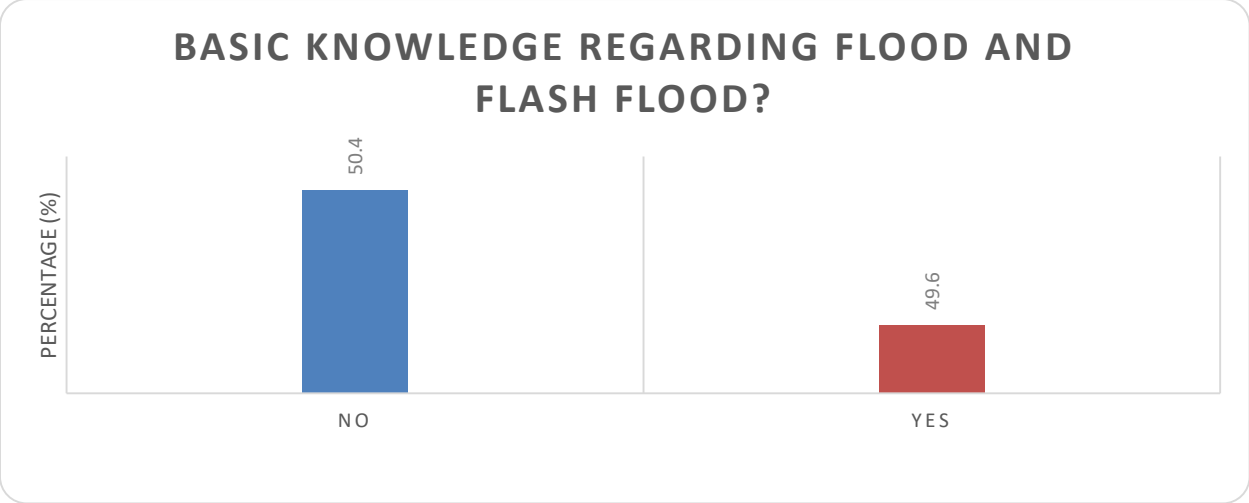


*Figure 13: Percentage distribution of respondents' basic knowledge regarding floods and flash floods*

There was a total of 262 responses to the question indicating a basic understanding of flooding and flash flooding. More than half of the respondents lacked knowledge about floods and flash floods, which is alarming given that they live in a region that is highly susceptible to flooding. About 49.6% of the respondents replied in the affirmative and stated that they have a basic understanding of the phenomena. (See Table 12)

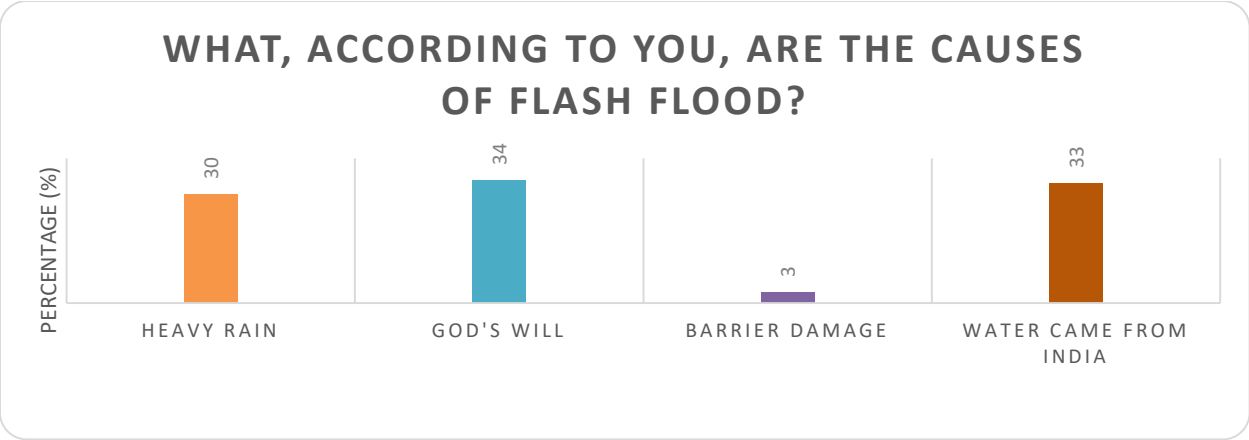


*Figure 14:Respondents' perception regarding the causes of flash floods*

Among the 209 respondents who shared their views on the causes of the recent flood, almost 34 percent of them attributed the incident the will of God while another 33% of respondents believed that water coming down from upstream India caused the flash flood. In addition, 30% of respondents stated heavy rainfall as the leading cause of the 2022 flood. And only a small percentage of respondents, roughly 3%, reported that the flash flood was a direct result of damaged barriers. (See Table 13)

*Table 18: Comparison between Case A and Case B*

| Aspect | Case A: North-East Bangladesh | Case B: Barak Valley, Assam, India | Comments |
|---|---|---|---|
| Basic Knowledge of Floods and Flash Floods | • 49.6% have basic understanding | • 49.6% have basic understanding | Identical responses in both cases, showing a moderate level of basic understanding among respondents. |
| Perception of the Causes of Flash Floods | • 34% attribute to the will of God<br>• 33% to water from upstream India<br>• 30% to heavy rainfall<br>• 3% to damaged barriers | • 34% attribute to the will of God<br>• 33% to water from upstream India<br>• 30% to heavy rainfall<br>• 3% to damaged barriers | The causes of flash floods are perceived similarly in both regions, with a mix of supernatural beliefs and environmental factors. |

## Section C: Early Warning and Preparedness of Flash Flood (Case A)

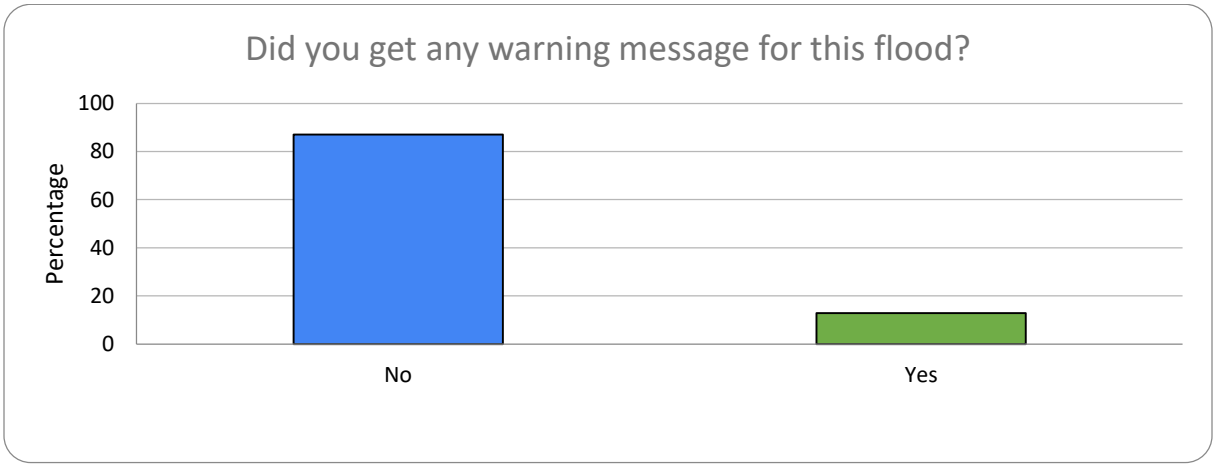


*Table 19: Percentage distribution of respondents regarding*

When asked if they had received any warning messages prior to the catastrophic flood, an astounding 87 percent of respondents responded in the negative, which raises concerns about the level of preparedness measures taken by relevant stakeholders, given that the flood caused significant damage to the region. Only about 13% of those surveyed reported receiving warning messages before the flood. (See Table 14)

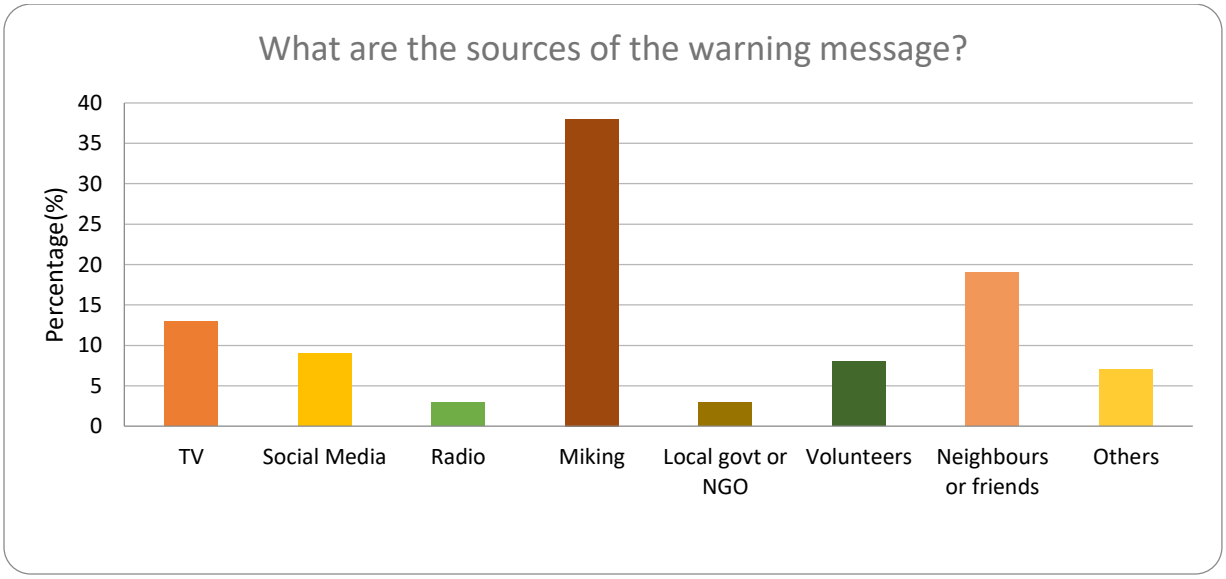


*Figure 15: Percentage distribution of major sources of warning message for the respondents*

At least 38% of participants stated that miking was the most prevalent source of warning messages for flood-affected people, as indicated by the data. Almost 20% of respondents reported hearing about the impending disaster from their neighbors and friends. About 13%

of respondents obtained early warning messages via television, followed by 9% from social media. Several responders received the flood warning messages from volunteers of different non-governmental organizations that participated in the dissemination of the warnings. A few reported hearing about the flood on the radio. In addition, approximately 8% of respondents indicated additional sources. (See Table 15)

## Section C: Early Warning and Preparedness of Flash Flood (Case B)

*Table 20:Flood water stayed in household this year*

| Flood stayed in household this year | No. of respondents | Percentage (%) |
|---|---|---|
| Up to 7 days | 21 | 14.0% |
| 8 to 14 days | 41 | 27.3% |
| 15 to 21 days | 51 | 34.0% |
| 22 to 30 days | 29 | 19.3% |
| More than 30 days | 07 | 4.7% |
| Not mentioned | 01 | 0.7% |
| **Total** | **150** | **100%** |

The above table (table 3.1) shows that most of the respondents expressed that flood water stayed in their household for 15 to 21 days (n=51; 34.0%) followed by 8 to 14 days (n=41; 27.3%), 22 to 30 days (n=29; 19.3%), up to seven days (n=21; 14.0%) and more than 30 days (n=07; 4.7%). Only one respondent (0.7%) could not mention.

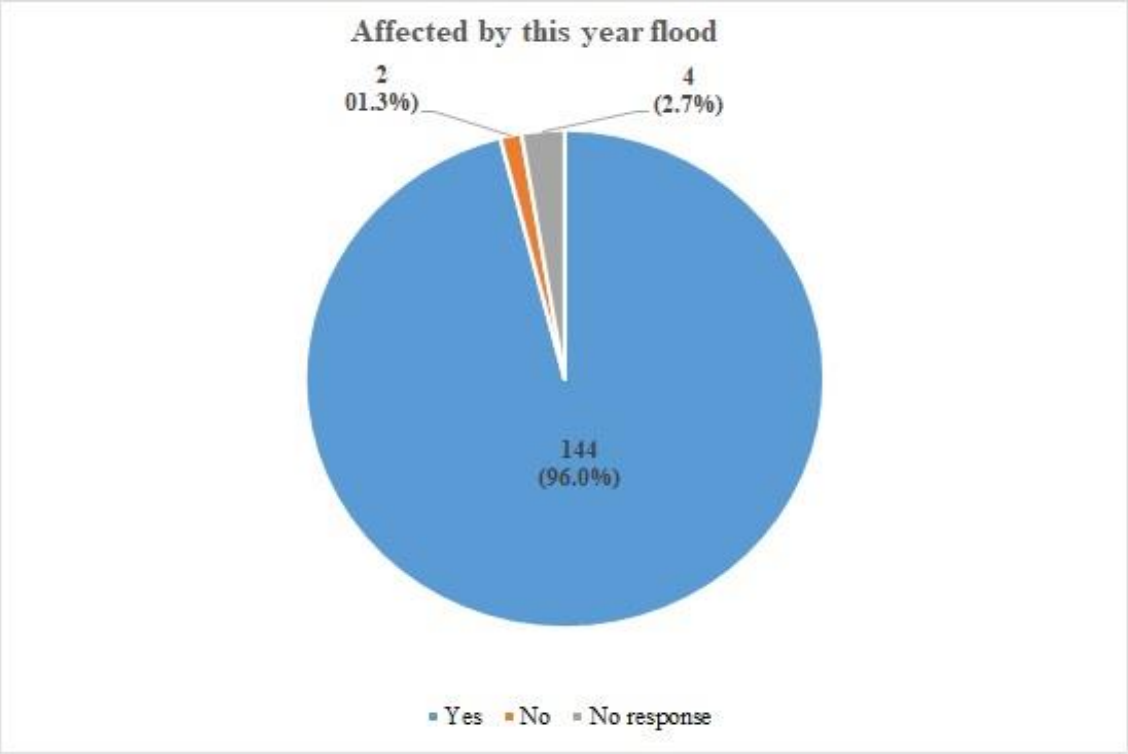


*Figure 16: Affected by this year flood*

The above diagram (figure/diagram 3.1) depicts that majority of respondent (n=144; 96.0%) were affected by this year flood followed by not affected (n=02; 01.3%). Four respondents (2.7%) were not given any response.

*Table 21: Cross tabulation of education and getting warning message of flood*

| **Educational Qualification (Count % in raw)** | **Getting warning message for this flood** | | **Total (%)** |
|---|---|---|---|
| | **Yes (%)** | **No (%)** | |
| No formal education | 01 (10.0%) | 9 (90.0%) | 10 (100%) |
| Literate | 03 (9.7%) | 28 (90.3%) | 31 (100%) |
| Primary | 05 (16.7%) | 25 (83.3%) | 30 (100%) |
| Secondary | 01 (8.3%) | 11 (91.7%) | 12 (100%) |
| HSC | 11 (35.5%) | 20 (64.5%) | 31 (100%) |
| Graduation | 15 (41.7%) | 21 (58.3%) | 36 (100%) |
| **Total** | **36 (24.0%)** | **114 (76.0%)** | **150 (100%)** |

The above table (table 3.2) shows that among no formal education group majority of 90.0% (n=9) were not getting warning message for this flood and only 10.0% (n=01) received warning message. Among literate group majority of 90.3% (n=28) were not getting warning message and only 9.7% (n=03) received warning message. Among primary education group majority of 83.3% (n=25) were not getting warning message for this flood and only 16.7% (n=05) received warning message. Among secondary education group majority of 91.7% (n=11) were not getting warning message for this flood and only 8.3% (n=01) received warning message. Among HSC education group majority of 64.5% (n=20) were not getting warning message for this flood and 35.5% (n=11) received warning message. Among graduate's majority of 58.3% (n=9) were not getting warning message for this flood and 41.7% (n=15) received warning message. Overall, majority of 76.0% (n=114) were not getting warning message for this flood and only 24.0% (n=36) received warning message.

*Table 22: Distribution of source of getting warning message*

| **Source of getting warning message** | **No. of respondent** | **Percentage (%)** |
|---|---|---|
| Television | 18 | 50.0% |
| Social media | 15 | 41.7% |
| Local Govt. or NGO | 02 | 5.6% |
| Neighbour or friends | 01 | 2.8% |
| **Total** | **36** | **100%** |

The above table (table 3.3) shows that half of the respondents (n=18; 50.0%) received warning message from the source of television followed by social media (n=15; 41.7%), local govt. or NGO (n=02; 5.6%) and neighbor or friends (n=01; 2.8%).

*Table 23: Distribution of effectiveness of received warning messages*

| Effectiveness of warning message | No. of respondents | Percentage (%) |
|---|---|---|
| Not effective at all | 09 | 25.0% |
| Slightly effective | 21 | 58.3% |
| Effective | 02 | 5.6% |
| Very effective | 04 | 11.1% |
| **Total** | **36** | **100%** |

The above table (table 3.4) shows the effectiveness of warning message where majority (n=21; 58.3%) opined that it was slightly effective followed by not effective at all (n=09; 25.0%), very effective (n=04; 11.1%) and effective (n=02; 5.6%).

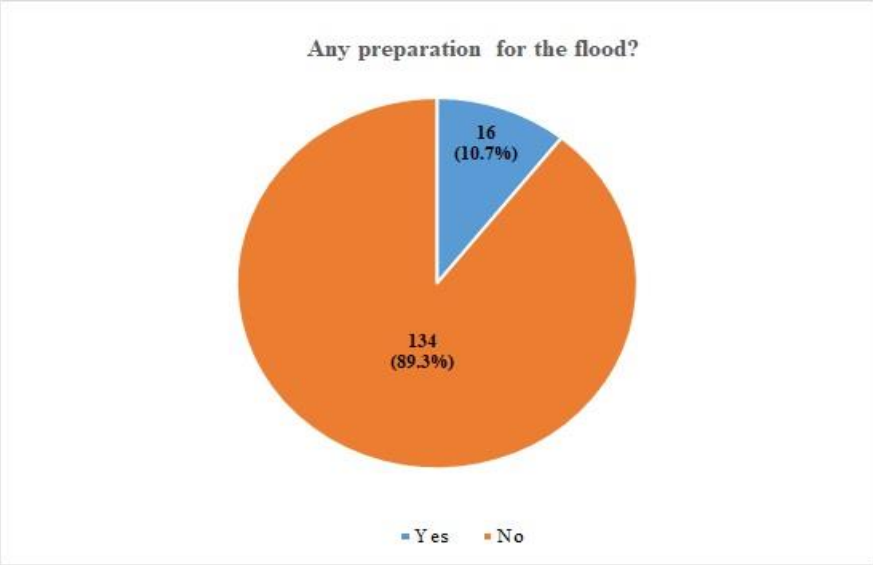


*Figure 17: Distribution of effectiveness of received warning messages*

The above diagram (figure/diagram 3.2) stated that majority of respondents (n=134; 89.3%) were not prepared for flood whereas only 10.7% (n=16) respondents were prepared.

*Table 24: Respondents time to get prepared themselves*

| Time to get prepared | No. of respondents | Percentage (%) |
|---|---|---|
| More than one week | - | - |
| At least one week | 01 | 6.3% |
| 1 – 2 days | 15 | 93.8% |
| No preparedness at all | - | - |
| Don't know | - | - |
| **Total** | **16** | **100%** |

The above table (table 3.5) shows the majority of respondent (n=15; 93.8%) were prepared themselves for the flood within 1 – 2 days and only one respondent (6.3%) took at least one week to get prepared.

*Table 25: Distribution of respondent's kind of preparation*

| Kind of preparation | No. of respondents | Percentage (%) |
|---|---|---|
| Savings & storing dry food | 01 | 6.3% |
| Making loft & storing dry food | 01 | 6.3% |
| Storing fuel & making loft | 01 | 6.3% |
| Savings, storing fuel, dry food, seeds & fodder, making loft, building house on higher platform | 05 | 31.3% |
| Savings, storing fuel, dry food, seeds & fodder, and making loft, | 01 | 6.3% |
| Savings, storing fuel, dry food & fodder, making loft, building house on higher platform | 02 | 12.5% |
| Savings, storing fuel & dry food, making loft and building house on higher platform | 01 | 6.3% |
| Saving & storing fuel | 01 | 6.3% |
| Only savings | 01 | 6.3% |
| Savings, storing fuel and making loft | 01 | 6.3% |
| Savings, storing fuel, making loft and storing fodder | 01 | 6.3% |
| **Total** | **16** | **100%** |

The above table (table 3.6) shows the different kinds of preparation made by the respondents. Most of the respondents (n=05; 31.3%) stated that they were involved in Savings, storing fuel, dry food, seeds & fodder, making loft, building house on higher platform followed by other different types of responses.

*Table 26: Comparison for Section C*

| Aspect | Case A: North-East Bangladesh | Case B: Barak Valley, Assam, India | Comments |
|---|---|---|---|
| Received Warning Messages Prior to Flood | 87% did not receive warnings | 76% did not receive warning messages | A significant majority in both cases did not receive early warnings. |
| Major Sources of Warning Messages | 38% through miking, 20% from neighbors/friends, 13% via TV, 9% social media | 50% via television, 41.7% social media, 5.6% local Govt./NGO, 2.8% neighbors/friends | Television and social media are significant sources in Case B, while miking is more prevalent in Case A. |
| Duration Flood Water Stayed in Household | Not mentioned | Majority for 15-21 days, followed by 8-14 days | Case B provides detailed data on the duration of flood impact. |

| | | | |
|---|---|---|---|
| Affected by Flood | Not mentioned | 96% affected by the flood | High impact of flood in Case B. |
| Educational Level and Receiving Warning Messages | Not mentioned | Higher education correlated with receiving more warnings | Case B shows a link between education and receiving warnings. |
| Effectiveness of Received Warning Messages | Not mentioned | 58.3% found warnings slightly effective, 25% not effective at all | Majority in Case B found the warnings only slightly effective. |
| Preparation for the Flood | Not mentioned | 89.3% were not prepared, 10.7% were prepared | A high lack of preparedness in Case B. |
| Time Taken to Prepare for Flood | Not mentioned | Majority prepared within 1-2 days | Quick preparation response in Case B among those who did prepare. |
| Kind of Preparation | Not mentioned | Various, with 31.3% involving savings, storing essentials, and building house on higher platform | Diverse preparedness strategies in Case B. |

## Section D: Impact on Income and Livelihood (Case A)

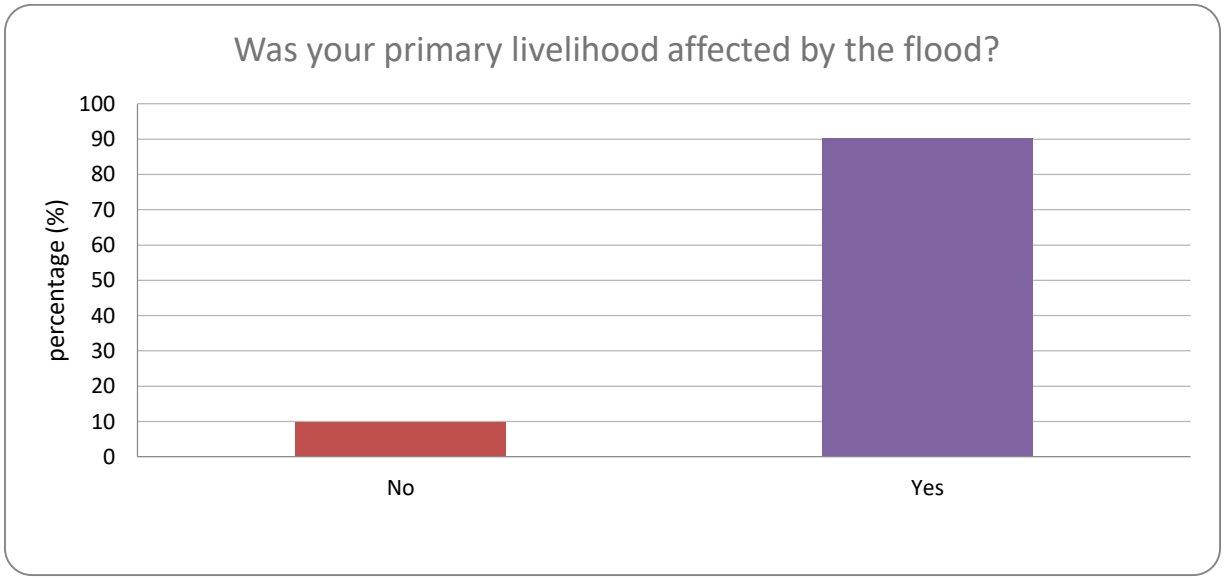


*Figure 16: Perceived impacts of the flood on the primary livelihood of the respondents*

The findings show that the flood had a substantial influence on the livelihood of the inhabitants in the region. About ninety percent of respondents were distressed by the flood's

impact on their principal means of subsistence. Yet, just about 10% of them reported that their primary source of income was not significantly affected by the flood. (See Table 16)

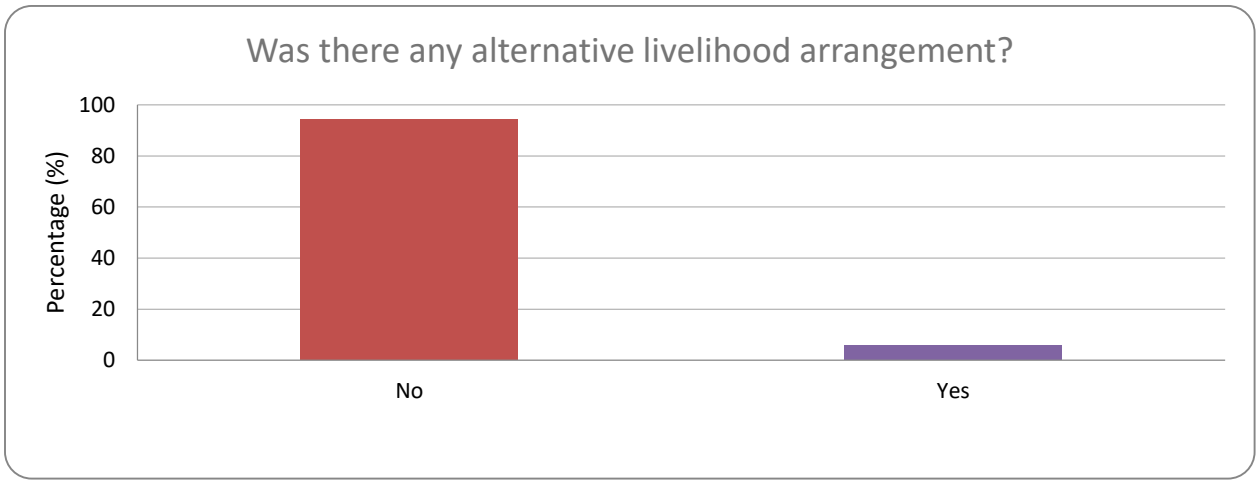


*Figure 17: Arrangement of alternative livelihood for the flood affected population*

Approximately 94% of the respondents said that there weren't any alternative livelihood arrangements for the flood-affected population while a minuscule minority of them disagreed. (See Table 17)

Now, the secondary analysis from relevant reports [3] [4] [5] shows that, regarding the key impacts and emerging issues of access to food and income, Sunamganj faced devastating consequences. Poverty data from Bangladesh show that almost 20 per cent of households in Sunamganj district live below the extreme poverty line, whereas, in Sylhet district, 6.5 per cent of the population lives below the poverty line.

Sunamganj and Sylhet districts faced emergency-level threats to food security and nutrition even before the disaster. According to the Bangladesh IPC Chronic Food Insecurity Report (June 2022), around 35 per cent of the population of Sunamganj district (969,119 people) experienced moderate to severe chronic food insecurity (IPC CFI levels 4). The recent third wave of flash floods threatened food and nutrition security in all affected Upazilas as 94 per

[3] *Sylhet Flash Floods: Situation & Support - Bangladesh | ReliefWeb*. (n.d.). Reliefweb.int. https://reliefweb.int/report/bangladesh/sylhet-flash-floods-situation-support

[4] Khan, M. R. (2022, July 9). *Tk 1,238cr lost to flood in Sylhet*. The Daily Star. https://www.thedailystar.net/environment/climate-crisis/natural-disaster/news/tk-1238cr-lost-flood-sylhet-3067616

[5] *Severe Flash Floods Situation Update 2 (22 June 2022) | United Nations in Bangladesh*. (n.d.). Bangladesh.un.org. Retrieved April 9, 2023, from https://bangladesh.un.org/en/187390-severe-flash-floods-situation-update-2-22-june-2022

cent of the affected areas witnessed the greatest cataclysm; many human casualties and deaths of animals, losses of livelihood, agricultural production as well as damage to infrastructure, communication and the functionality of the local markets and supply chains of essential commodities, transportation and communication have been severely affected which may contribute to increased food insecurity[6].

In both districts, 6 out of 10 households rely on low-value and unsustainable livelihood sources such as unskilled day labour (both agriculture and non-agriculture) or traditional/subsistence fishing, which often generates inadequate and unpredictable income. People do not have access to diversified work opportunities. On top of the existing livelihood and income crisis, the third wave of flash floods has largely affected agriculture and associated livelihoods. In Sunamganj, satellite observation as of 17 June identified approximately 266,137 hectares of damaged croplands (WFP ADAM). In these circumstances, there is a high risk that women and girls will adopt negative coping strategies (taking loans; child marriage; decreasing meals particularly women and girls, selling assets like chicken, goats, and jewellery) and people are at risk of losing all household assets. The loss of livelihoods will strike women hardest, taking away their fundamental rights, including decision-making and access to services. In many cases, lack of income has triggered violence against women and girls. Domestic violence and early and forced girl child marriage are the most common forms of GBV [7]. These conclusions are consistent with the primary data of the corresponding action research.

## Section D: Impact on Income and Livelihood (Case B)

*Table 27: Impact of flood on respondent's occupation*

| Impact of flood on occupation | No. of respondents | Percentage (%) |
|---|---|---|
| Unable to do work | 104 | 69.3% |
| Shop was damaged | 08 | 5.3% |
| Financial impact | 08 | 5.3% |
| No major impact as such | 07 | 4.7% |
| No response | 23 | 15.3% |
| **Total** | **150** | **100.0** |

[6] *Living with Floods and Reducing Vulnerability in Sylhet – Global Policy Institute*. (n.d.). Retrieved April 9, 2023, from https://gpilondon.com/publications/living-with-floods-and-reducing-vulnerability-in-sylhet

[7] www.who.int. (n.d.). *Bangladesh Flood 2022: WHO Collaboration with DGHS/MOHFW*. [online] Available at: https://www.who.int/bangladesh/news/detail/23-06-2022-bangladesh-flood-2022-who-collaboration-with-dghs-mohfw.

The above table (table 4.1) stated the impact of flood on respondent's occupation where majority of respondents (n=104; 69.3%) pointed out that they were unable to do work followed by shop was damaged (n=08; 5.3%), financial impact (n=08; 5.3%) and no major impact as such (n=07; 4.7%). 23 participants were given no response on impact of flood on their occupation.

*Table 28: Distribution of age group and impact of flood on occupation*

| Age Group in years | Impact of Flood on Occupation | | | | | Total |
|---|---|---|---|---|---|---|
| | No Response | Unable to work | Shop was damaged | No major impact | Financial impact | |
| Less than 18 Years | 0 | 0 | 0 | 0 | 1 | 01 |
| 18 years - 29 years | 1 | 16 | 0 | 2 | 1 | 20 |
| 30 years - 39 years | 1 | 19 | 0 | 0 | 2 | 22 |
| 40 years - 49 years | 0 | 23 | 2 | 0 | 3 | 28 |
| 50 years - 59 years | 6 | 19 | 4 | 3 | 1 | 33 |
| 60 years - 69 years | 7 | 11 | 1 | 2 | 0 | 21 |
| 70 & above years | 4 | 8 | 0 | 0 | 0 | 12 |
| No information on age | 4 | 8 | 1 | 0 | 0 | 13 |
| **Grand Total** | **23** | **104** | **8** | **7** | **8** | **150** |

The above table (table 4.2) shows the distribution of age group and impact of flood on occupation. Majority of respondents (n=104) among the age group of 18 years and above were unable to work because of flood. Flood has an impact on almost every age group.

*Table 29: Respondents primary livelihood affected by the flood*

| **Primary livelihood affected by the flood** | **No. of respondents** | **Percentage (%)** |
|---|---|---|
| Yes | 142 | 94.7% |
| No | 04 | 2.7% |
| No response | 04 | 2.7% |
| **Total** | **150** | **100%** |

The above table (table 4.3) shows the information on primary livelihood affected by the flood. Majority of respondents (n=142; 94.7%) stated that their primary livelihood was affected by the flood and 2.7% (n=04) stated no. No any response given by four participants (2.7%).

*Table 30: Distribution of gender and primary livelihood affected by the flood*

| **Primary livelihood affected by the flood (Count % in column)** | **Gender** | | **Total (%)** |
|---|---|---|---|
| | **Male (%)** | **Female (%)** | |
| Yes | 89 (94.7%) | 53 (94.6%) | 142 (94.7%) |
| No | 03 (3.2%) | 01 (1.8%) | 04 (2.7%) |
| No response | 02 (2.1%) | 02 (3.6%) | 04 (2.7%) |
| **Grand Total** | **94 (100%)** | **56 (100%)** | **150 (100%)** |

The above table (table 4.4) shows that majority of 94.7% (n=89) of males and 94.6% (n=53) of females were affected by the flood in terms of their livelihood.

-

*Table 31: Respondents alternate livelihood arrangement*

| Alternate livelihood arrangement | No. of respondents | Percentage (%) |
|---|---|---|
| Yes | 08 | 5.3% |
| No | 128 | 85.3% |
| No response | 14 | 9.3% |
| **Total** | **150** | **100%** |

The above table (table 4.5) stated that majority of respondents (n=128; 85.3%) had no such alternate livelihood arrangements and 5.3% (n=08) of respondents had alternate livelihood arrangement. No any response given by 14 participants (9.3%).

*Table 32: Received aid for livelihood management*

| Received aid for livelihood management | No. of respondents | Percentage (%) |
|---|---|---|
| Yes | 56 | 37.3% |
| No | 94 | 62.7% |
| **Total** | **150** | **100%** |

The above table (table 4.6) stated that majority of respondents (n=94; 62.7%) were not received any aid for their livelihood management and 37.3% (n=56) of respondents were received aid for their livelihood management.

*Table 33: Distribution of gender and received aid for livelihood management*

| Received aid for livelihood management (Count % in column) | Gender | | Total (%) |
|---|---|---|---|
| | Male (%) | Female (%) | |
| Yes | 36 (38.3%) | 20 (35.7%) | 56 (37.3%) |
| No | 58 (61.7%) | 36 (64.3%) | 94 (62.7%) |
| **Grand Total** | **94 (100%)** | **56 (100%)** | **150 (100%)** |

The above table (table 4.7) shows that majority of males (n=58; 61.7%) were not received aid for livelihood management and only 38.3% (n=36) were received aid. Among females, majority of them (n=36; 64.3%) were not received aid and 35.7% (n=20) were received it.

*Table 34: Chi square table for gender and received aid for livelihood management*

| **Variable** | ***X²*** | ***df*** | ***p Value*** |
|---|---|---|---|
| Gender and received aid for livelihood management | 0.100 | 01 | 0.752 |

Note- Significant p Value = 0.05

The above chi square table (table 4.8) stated that gender and received aid for livelihood management ($X^2$= .100, *df* = 1, p = .752) were statistically insignificant.

*Table 35: Distribution of effectiveness of the aid for flood*

| **Effectiveness of aid received** | **No. of respondents** | **Percentage (%)** |
|---|---|---|
| Not effective at all | 06 | 10.7% |
| Slightly effective | 34 | 60.7% |
| Effective | 10 | 17.9% |
| Very effective | 06 | 10.7% |
| **Total** | **56** | **100%** |

The above table (table 4.9) shows the effectiveness of aid received where majority (n=34; 60.7%) opined that it was slightly effective followed by effective (n=10; 17.9%), very effective (n=06; 10.7%) and not effective at all (n=06; 10.7%).

*Table 36: One way ANOVA table for gender, age group and effectiveness of aid received*

| **Factors** | **Df** | **F** | **p** |
|---|---|---|---|
| Gender and effectiveness of aid received | (7, 142) | 1.803 | 0.091 |
| Age group and effectiveness of aid received | (1, 148) | 0.343 | 0.559 |

Significant p Value = 0.05

The above table (table 4.10) represents that there was no significant difference found between gender and effectiveness of aid received (p = 0.091). Similarly, no significant difference found between age group and effectiveness of aid received (p = 0.559).

*Table 37: Respondent's sources of received the aid*

| Sources of aid | No. of respondent | Percentage (%) |
|---|---|---|
| Government | 37 | 66.1% |
| NGO/INGO | 15 | 26.8% |
| Both Government & NGO | 03 | 5.4% |
| Others | 01 | 1.8% |
| **Total** | **56** | **100%** |

The above table (table 4.11) shows the sources of aid received by the respondents. Majority of respondent (n=37; 66.1%) received government aid followed by aid from NGO/INGO (n=15; 26.8%), both government & NGO (n=03; 5.4%) and other sources (n=01; 1.8%).

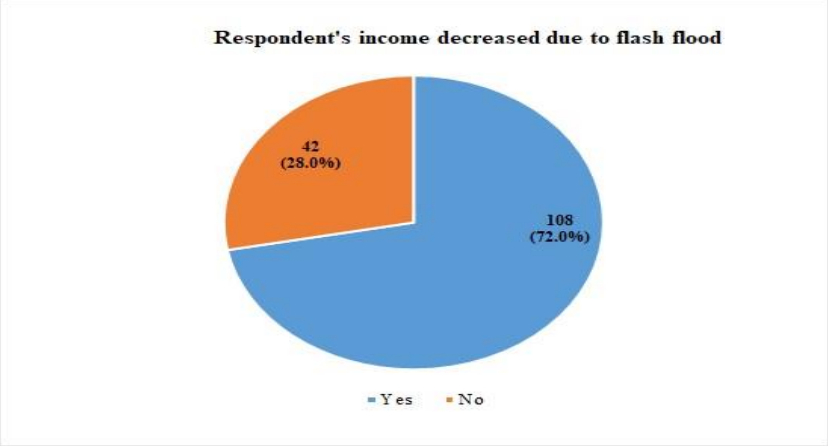


*Figure 18: Figure/diagram 4.1: Respondent's income decreased due to flash flood*

The above diagram (figure/diagram 4.1) stated the status of decreased income of the respondent due to flash flood. Majority of the respondent (n=108; 72.0%) stated that their income was decreased and 28.0% (n=42) stated that there was no decline in income.

*Table 38: Respondent's survival with low income*

| Survival with low income | No. of respondent | Percentage (%) |
|---|---|---|
| Ration & Bandhan | 06 | 5.6% |
| Borrowed money from different funds | 01 | 0.9% |
| Borrowed money from money lander | 17 | 15.7% |
| Ration | 11 | 10.2% |
| Borrowed money from Bandhan Bank | 09 | 8.3% |

| | | |
|---|---|---|
| Support from family member | 09 | 8.3% |
| Savings and neighbour's assistance | 05 | 4.6% |
| Savings only | 28 | 25.9% |
| Daily meal quantity reduced | 01 | 0.9% |
| Ration & government relief | 16 | 14.8% |
| No any response | 05 | 4.6% |
| **Total** | **108** | **100%** |

The above table (table 4.7) shows that more than one quarter (n=28; 25.9%) of respondents were survived through their savings only followed by borrowed money from money lander (n=17; 15.7%), ration & government relief (n=16; 14.8%), ration (n=11; 10.2%), support from family member (n=09; 8.3%), borrowed money from Bandhan bank (n=09; 8.3%), ration and Bandhan (n=06; 5.6%), savings and neighbor's assistance (n=05; 4.6%), borrowed money from different funds (n=01; 09%) and daily meal quantity reduced (n=01; 09%). No any response was given by five respondents (4.6%).

*Table 39: Comparison between Case A and B for section D*

| Aspect | Case A: North-East Bangladesh | Case B: Barak Valley, Assam, India | Comments |
|---|---|---|---|
| Impact on Primary Livelihood | 90% significantly affected | 94.7% reported primary livelihood affected | Both regions experienced severe impacts on livelihoods, slightly higher in Case B. |
| Alternative Livelihood Arrangements | 94% reported none | 85.3% reported no alternative arrangements | Lack of alternative livelihood is a major issue in both cases, slightly more acute in Case A. |
| Secondary Analysis: Poverty and Food Insecurity | Severe poverty and food insecurity in Sunamganj and Sylhet districts | Not mentioned | Detailed secondary analysis provided only for Case A. |
| Impact on Specific Occupations | Not mentioned | 69.3% unable to work, 5.3% shops damaged | Specific occupational impacts detailed in Case B. |
| Aid for Livelihood Management | Not mentioned | 37.3% received aid | Case B provides specific data on aid received, not mentioned in Case A. |

| | | | |
|---|---|---|---|
| Effectiveness of Aid | Not mentioned | 60.7% found aid slightly effective | Effectiveness of aid is specifically analyzed in Case B. |
| Sources of Aid | Not mentioned | Majority received government aid | Case B details sources of aid, not mentioned in Case A. |
| Income Decrease Due to Flood | Not mentioned | 72% reported decreased income | Specific data on income decrease provided in Case B. |
| Survival Strategies with Low Income | Not mentioned | Various strategies like savings, borrowing, reduced meals | Case B provides detailed survival strategies, not mentioned in Case A. |

## Section E: Impact on Gender and Intersectionality (Case A)

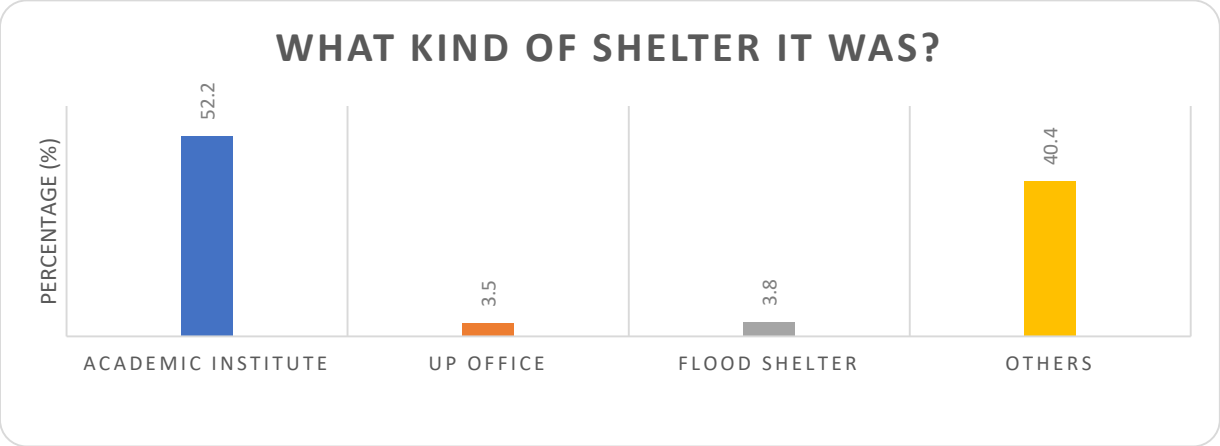


*Figure 19: Types of shelter in the flood affected areas:*

It was found that academic institutions, especially the primary and secondary schools are used as shelters during floods and other emergencies. These schools are built in a way that can be turned into shelters when needed. More than half of the respondents, as the data reveals, took shelter in nearby academic instituitions while a tiny percentage of them relocated to Upazila Parishad Office building and to some dedicated floods shelters. Approximately 40% of the respondents cited different types of shelters where they took refuge. (See Table 18)

## Section E.1: Safety and Security for Women in the Shelter

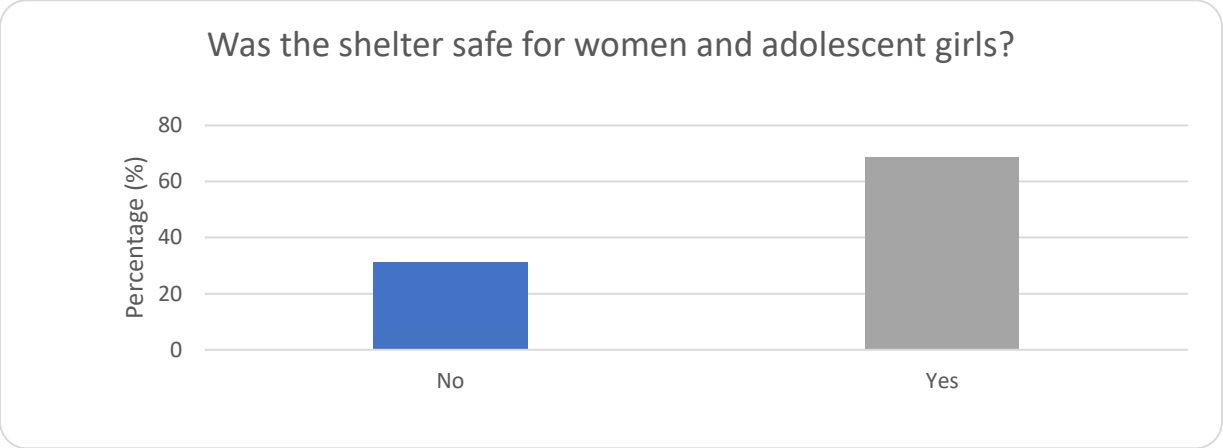


*Figure 20: Safety and security for women and adolescent girls in the shelters*

A safe shelter setting for women and adolescent can significantly reduce the occurrence of harassment and other sorts of inappropriate incidents. Typically, there is insufficient space for flood-affected women and girls in shelters, and they are forced to stay with men, which might lead to undesirable circumstances. Hence, the respondents of the study were asked whether the shelters they took refuge in were safe for women and adolescent girls. Almost 70% of respondents indicated that the shelters were completely safe for women and girls. They added that some shelters even had separate spaces for women. 30% of respondents, however, believed that the shelters were unsafe for their women and adolescent girls. (See Table 19)

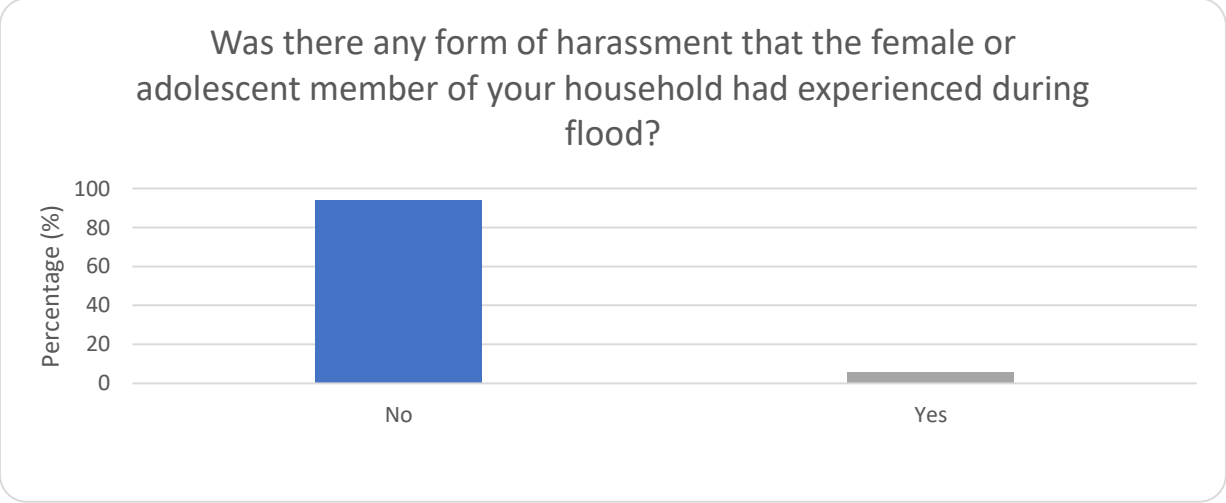

*Figure 21: Occurrence of harassment during the flood*

When asked regarding any form of harassment that the female or adolescent member of the respondents' households experienced during the flood, nearly 95% of them stated in the negative and added that women and young girls are frequently cared for and looked after by the male members of the households, and in some flood shelters women are kept in separate space from their counterparts. Nonetheless, around 5% of the respondents indicated that female members of their households became the victims of harassment. (See Table 20)

**Section E.2: Menstrual and Maternal Health**

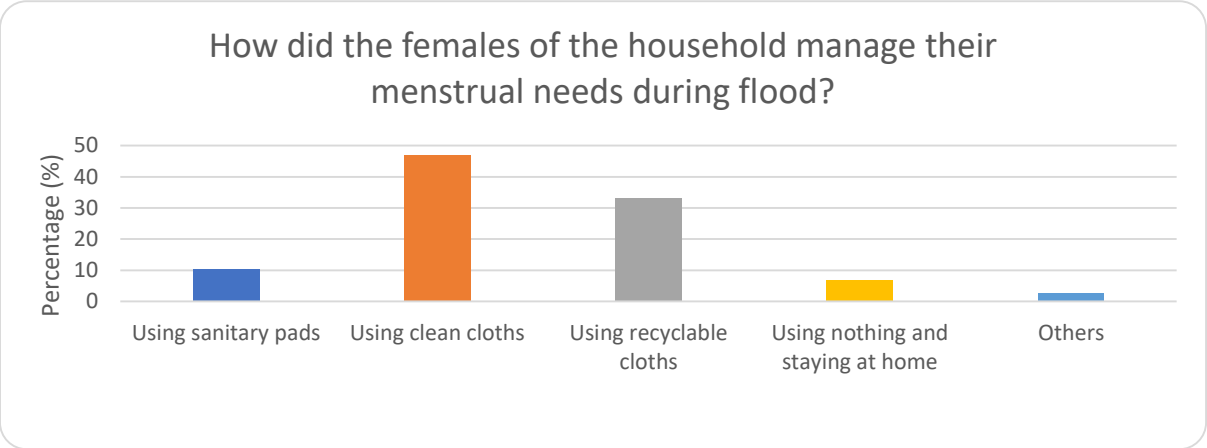


*Figure 22: Management of menstrual needs during flood*

Managing and caring for menstrual demands may become incredibly challenging during floods, and the scenario for the women in the Northeastern region of Bangladesh was no exception when it was extensively inundated, affecting millions of residents. Women were profoundly impacted by the flood. Taking care of their menstrual health is one of the women's key worries, and during the flood, it became even more difficult. When asked how the female members of the households managed their menstruation demands, roughly 47% of the respondents stated the women in the households utilized clean garments, while 33% opted for recyclable clothes. Just about 10% of respondents indicated the use of sanitary pads, while 7% stated that menstruating women did not use anything and simply stayed at home. Yet, a few respondents also indicated additional methods for addressing menstruation needs. (See Table 21)

From the secondary analysis regarding key impacts and emerging issues of access to shelter and its safety, security and protection aspects, the respective cohort faced serious issues. According to the NAWG Primary Assessment, the flash floods in the north-eastern part of Bangladesh have resulted in significant displacement across approximately 33 unions in both Sylhet and Sunamganj districts, with displaced persons taking temporary shelter

predominantly with relatives, in government evacuation centers and educational institutes. As of the daily Disaster Report by MoDMR, 947 shelters are accommodating 340632 people. There are a total of 65,087 marooned families, about 72 per cent of the people in the affected areas live in katcha housing. According to the NAWG preliminary assessment, it is reported that in a total of 13 per cent of assessed unions, most of the houses (more than 60 per cent) in the respective unions have been damaged either fully or partially. In 21 per cent of assessed unions, many houses (between 40 and 60 per cent) have been impacted. Since most of the areas were inundated, many people have been displaced. Some 'D form' says secured places for women have been confirmed, but it was revealed from the conversation with local people that numbers are insufficient for huge number of displaced people [8].

People whose houses were damaged and destroyed have lost their usual living space, and they are facing difficulties to ensure a minimum living space with dignity, privacy, and protection, especially for women and adolescent girls. Many households are isolated due to road damage, while some have taken refuge in open /dry areas. The safety and security of women and girls in those households are at high risk. The duration of shelter stays might be prolonged due to the crisis. In terms of protection, few shelter facilities can ensure safety and security for women and adolescent girls and safe WASH facilities for women and girls. In most shelters, there are no separate spaces for women and girls. The Preliminary Impact assessment basing on intersectional lens already indicated that the impact of the flood on households will drive causes of early marriage and the most affected district Sunamganj has the highest child marriage prevalence – 41.9% in the region. 200 street-based sex workers were severely impacted and in need of urgent support [9].

Regarding the access to WASH facilities in the shelters and adjacent area, the secondary analysis finds severe situation. Water and sanitation facilities have been severely affected, in particular in Sunamganj and Sylhet districts. Flash floods inundated and destroyed WASH infrastructure and contaminated water sources in 67 unions that now lack access to safe drinking water. In this situation, most of the areas in Sylhet and Sunamganj districts are at risk of an outbreak of waterborne diseases, and many people have been displaced [10].

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[8] Needs Assessment Working Group-NAWG. (2022). *North Eastern Flash Flood , May-June 2022 Key Immediate Needs and Situation Analysis. June*.

[9] *Rapid gender analysis of flood situation in North and North-Eastern Bangladesh*. (2022). UN Women – Asia-Pacific. Retrieved April 9, 2023, from https://asiapacific.unwomen.org/en/digital-library/publications/2022/07/rapid-gender-analysis-of-flood-situation-in-north-and-north-eastern-bangladesh.

[10] [10] *Rapid gender analysis of flood situation in North and North-Eastern Bangladesh*. (2022). UN Women – Asia-Pacific. Retrieved April 9, 2023, from https://asiapacific.unwomen.org/en/digital-

The number of WASH facilities in flood shelters is not adequate, and facilities are insufficient to ensure privacy, security and dignity for women, girls, people with disabilities and children. Girls and women are in an acute situation due to the lack of menstrual hygiene management kits. Evacuated people have stated that they lack separate WASH or sanitation facilities for women and men, lighting is inadequate as the power supply has been shut off, menstrual hygiene supplies are totally absent; there are no facilities to provide privacy for bathing and breastfeeding, and the lack of separate space for women and girls has created an unfavourable environment for those who must stay overnight in shelters [11]. These findings are well aligned with the primary data of the respective action research.

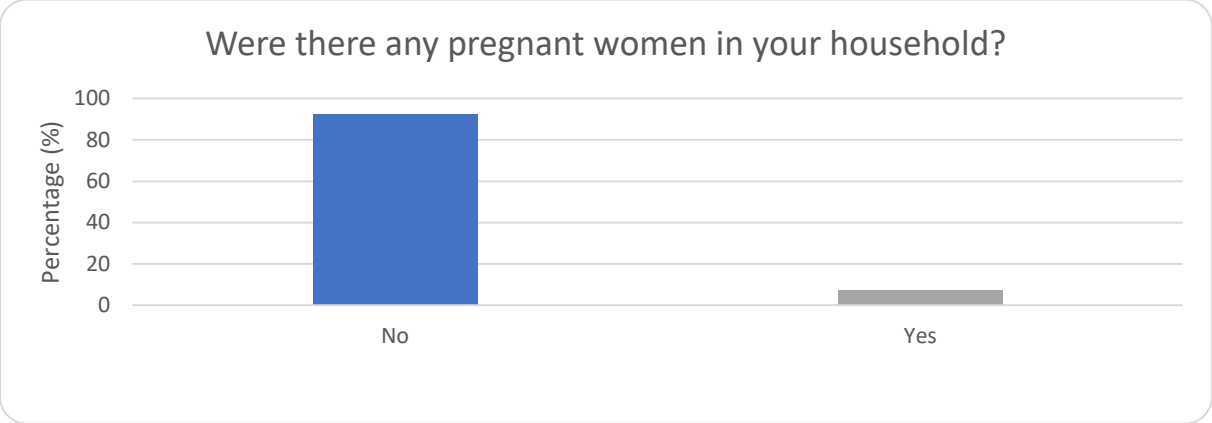


*Figure 23: Percentage distribution of pregnant women in the households of the respondents*

Pregnant women are considered to be one of the most vulnerable groups within a community during an emergency, and they require additional care whether in a shelter or at their homes. The data indicate that only a tiny percentage of respondents, approximately 8%, reported having pregnant women in their households, whereas the remainder, more than 92%, reported the opposite. (See Table 22)

library/publications/2022/07/rapid-gender-analysis-of-flood-situation-in-north-and-north-eastern-bangladesh.

[11] *Gender in Humanitarian Action Working Group: Rapid Gender Analysis of Flood Situation in North and North-Eastern Bangladesh, June 2022 - Bangladesh | ReliefWeb*. (2022). Reliefweb.int. https://reliefweb.int/report/bangladesh/gender-humanitarian-action-working-group-rapid-gender-analysis-flood-situation-north-and-north-eastern-bangladesh-june-2022.

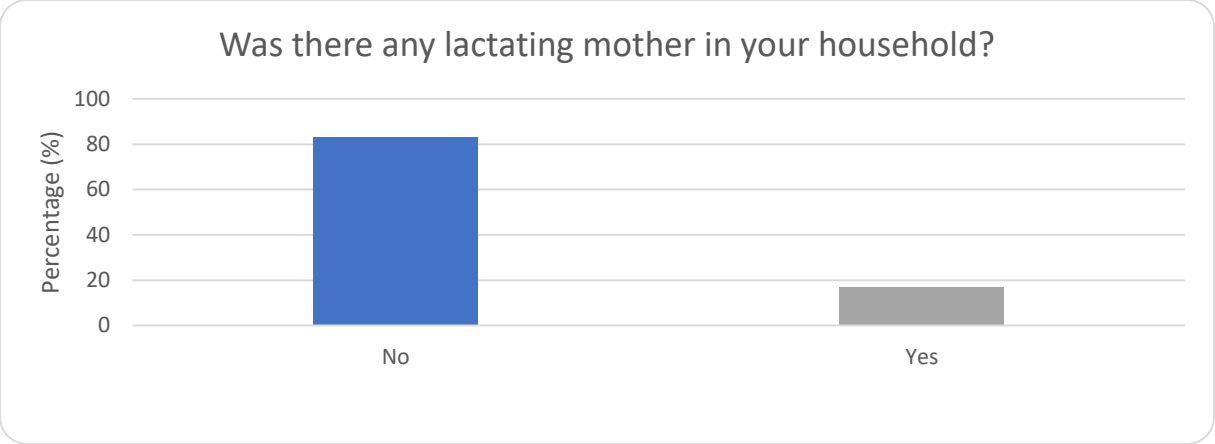


*Figure 24: Percentage distribution of lactating mothers in the households of the respondents*

Lactating mothers also require additional treatments along with their babies. And during emergencies, they may become much more vulnerable than other community groups. Hence, the study sought to determine the number of lactating mothers there were during the flood to understand the extent of their vulnerabilities and the impact the flood had on them. However, more than 80% of respondents reported they did not have any breastfeeding women in their houses during the flood, whereas the remaining respondents said they did. (See Table 23)

## Section E: Impact on Gender and Intersectionality (Case B)

*Table 40: Respondent's household member moved to the shelter*

| **Household members moved to the shelter** | **No. of respondents** | **Percentage (%)** |
|---|---|---|
| Yes | 101 | 67.3% |
| No | 49 | 32.7% |
| **Total** | **150** | **100%** |

The above table (table 5.1) stated that majority of household members (n=101; 67.3%) were moved to the shelter and 32.7% (n=49) were not moved anywhere.

*Table 41: Distribution of gender and household member moved to the shelter*

| Household member moved to the shelter (Count % in column) | Gender | | Total (%) |
|---|---|---|---|
| | Male (%) | Female (%) | |
| Yes | 61 (64.9%) | 40 (71.4%) | 101 (67.3%) |
| No | 33 (35.1%) | 16 (28.6%) | 49 (32.7%) |
| **Grand Total** | **94 (100%)** | **56 (100%)** | **150 (100%)** |

The above table (table 5.2) shows that among males 64.9% (n=61) were moved to the shelter and 35.1% (n=33) were not moved. Among females, 71.4% (n=40) were moved to the shelter and 28.6% (n=16) were not moved.

*Table 42: Respondents kind of shelter*

| Kind of shelter | No. of respondents | Percentage (%) |
|---|---|---|
| Academic institute | 30 | 29.7% |
| Up Office | 01 | 1.0% |
| Flood Shelter | 02 | 2.0% |
| Others | 07 | 6.9% |
| Market | 03 | 3.0% |
| Neighbour's shelter | 15 | 14.9% |
| Relative's house | 28 | 27.7% |
| Staying at road | 01 | 1.0% |
| Friend's house | 01 | 1.0% |
| Rent house | 01 | 1.0% |
| Top of the building roof | 10 | 9.9% |
| Industry | 01 | 1.0% |
| Club | 01 | 1.0% |
| **Total** | **101** | **100%** |

The above table (table 5.3) shows the kind of shelter taken during flood. Most of the respondent (n=30; 29.7%) stated that they took shelter in academic institute followed by relative's house (n=28; 27.7%), neighbour's shelter (n=15; 14.9%), top of the building roof (n=10; 9.9%) and other different kinds of shelters.

*Table 43: Female members of household gone to shelter during flood*

| Gone to shelter during flood | No. of respondents | Percentage (%) |
|---|---|---|
| Yes | 100 | 99.0% |
| No | 01 | 1.0% |
| **Total** | **101** | **100%** |

The above table (table 5.4) shows that majority of women household members (n=100; 99.0%) went to shelter during flood and only one women household member (1,0%) could not go to shelter during flood.

*Table 44: Shelter facilities (washroom + Space) for women*

| Washroom + Space | No. of respondents | Percentage (%) |
|---|---|---|
| Separate + Sufficient | 22 | 22.0% |
| Separate + Insufficient | 13 | 13.0% |
| Combined + Sufficient | 20 | 20.0% |
| Combined + Insufficient | 45 | 45.0% |
| **Total** | **100** | **100%** |

The above table (table 5.5) shows the shelter facility i.e., washroom + space for women. Most of the respondent (n=45; 45.0%) stated shelter facility was combined + insufficient followed by separate + sufficient (n=22; 22.0%), combined + sufficient (n=20; 20.0%) and separate + insufficient (n=13; 13.0%).

*Table 45: afeness of shelter for women and adolescent girls*

| Safeness of shelter | No. of respondents | Percentage (%) |
|---|---|---|
| Yes | 86 | 86.0% |
| No | 04 | 4.0% |
| No any response | 10 | 10.0% |
| **Total** | **100** | **100%** |

The above table (table 5.6) stated that majority of women and adolescent girls (n=86; 86.0%) were felt safe to the shelter and 4.0% (n=04) stated about no safeness. 10.0% (n=10) of respondents were not given any kind of response.

*Table 46: Female or adolescent members harassment at household during flood*

| Harassment of female or adolescent members | No. of respondents | Percentage (%) |
|---|---|---|
| Yes | 02 | 02.0% |
| No | 88 | 88.0% |
| No any response | 10 | 10.0% |
| **Total** | **100** | **100%** |

The above table (table 5.7) stated that majority of female and adolescent members (n=88; 88.0%) were not faced any kind of harassment at household during flood and 2.0% (n=02) stated that they faced harassment during flood but the respondent could not narrate the nature of harassment. 10.0% (n=10) of respondents were not given any kind of response.

*Table 47: Decision maker of the household during flood*

| Decision maker of the household | No. of respondents | Percentage (%) |
|---|---|---|
| Male Headed | 124 | 82.7% |
| Female Headed | 26 | 17.3% |
| **Total** | **150** | **100%** |

The above table (table 5.8) stated that majority of males (n=124; 82.7%) were heading the household during flood followed by female heads (n=26; 17.3%).

*Table 48: Chi square table for gender and decision makers during flood*

| Variable | $X^2$ | *df* | *p Value* |
|---|---|---|---|
| Gender and decision makers during flood | 25.363 | 01 | 0.000 |

Note- Significant p Value = 0.05

The above chi square table (table 5.9) stated that gender and decision makers during flood ($X^2$= 25.363, *df* = 1, p = .000) were statistically significant because majority of male headed family members were the source of decision-making process during flood.

*Table 49: Challenges for the adolescent girl during flood*

| Challenges for the adolescent girls | No. of Respondents | Percentage (%) |
|---|---|---|
| Lake of personal space | 02 | 1.3% |
| Unhygienic issue | 15 | 10.0% |
| No any response | 133 | 88.7% |
| **Total** | **150** | **100%** |

The above table (table 5.10) stated the challenges for the adolescent girls during flood. Total 17 participants were responded and 88.7% (n=133) did not mention any challenges. 10.0% (n=15) of respondents stated unhygienic issues noticed among adolescent girls and 1.3% (n=02) focused upon lake of personal space.

*Table 50: Management of menstrual need by females during flood*

| Menstrual need management by females | No. of respondents | Percentage (%) |
|---|---|---|
| Using sanitary pads | 88 | 58.7% |
| Using clean cloths | 40 | 26.7% |
| Using recyclable cloths | 08 | 5.3% |
| Using nothing and staying at home | 06 | 4.0% |
| Others | 01 | 0.7% |
| No response | 07 | 4.7% |
| **Total** | **150** | **100%** |

The above table (table 5.11) depicts the management of menstrual need by females during flood. Majority of respondents (n=88; 58.7%) focused on using sanitary pads followed by using clean cloths (n=40; 26.7%), using recyclable cloths (n=08; 5.3%), using nothing and staying at home (n=06; 4.0%) and other management (n=01; 0.7%). Seven respondents (4.7%) did not mention any menstrual need management strategies.

*Table 51: Distribution of pregnant women in the household*

| Pregnant women in the household | No. of respondents | Percentage (%) |
|---|---|---|
| Yes | 10 | 6.7% |
| No | 140 | 93.3% |
| **Total** | **150** | **100%** |

The above table (table 5.12) stated that majority of the household (n=140; 93.3%) had no pregnant women followed by pregnant women in the household (n=10; 6.7%).

*Table 52: Pregnant women affected by the flood*

| Reasons | No. of respondents | Percentage (%) |
|---|---|---|
| Lack of access to water, sanitation, security, healthcare | 08 | 80.0% |
| Suffered from mental stress, anxiety | 01 | 10.0% |
| Unable to take balanced food + Lack of access to water, sanitation, security, healthcare + Suffered from mental stress, anxiety | 01 | 10.0% |
| **Total** | **10** | **100%** |

The above table (table 5.13) stated that majority of pregnant women (n=08; 80.0%) were affected by lack of access to water, sanitation, security, healthcare followed by suffered from mental stress, anxiety (n=01; 10.0%) and unable to take balanced food + lack of access to water, sanitation, security, healthcare + suffered from mental stress, anxiety (n=01; 10.0%).

*Table 53: Distribution of lactating mother in the household*

| Lactating mother in the household | No. of respondents | Percentage (%) |
|---|---|---|
| Yes | 08 | 5.3% |
| No | 142 | 94.7% |
| **Total** | **150** | **100%** |

The above table (table 5.14) stated that majority of the household (n=142; 94.7%) had no lactating women followed by lactating women in the household (n=08; 5.3%).

*Table 54: Lactating women affected by the flood*

| Reasons | No. of respondents | Percentage (%) |
|---|---|---|
| Unable to take balanced food | 03 | 37.5% |
| Lack of access to water, sanitation, security, healthcare | 03 | 37.5% |
| Lack of access to water, sanitation, security, healthcare + Suffered from mental stress, anxiety | 01 | 12.5% |
| Others (Child died due to flood) | 01 | 12.5% |
| **Total** | **08** | **100%** |

The above table (table 5.15) stated that most of the lactating women (n=03; 37.5%) were affected by unable to take balanced food followed by lack of access to water, sanitation, security, healthcare (n=03; 37.5%), lack of access to water, sanitation, security, healthcare + Suffered from mental stress, anxiety (n=01; 10.0%) and other reasons i.e., child died due to flood (n=01; 12.5%).

There was no transgender (n=150; 100%) found in this study.

*Table 55: Distribution of person with disability in the household*

| Person with disability in the household | No. of respondents | Percentage (%) |
|---|---|---|
| Yes | 09 | 6.0% |
| No | 141 | 94.0% |
| **Total** | **150** | **100%** |

The above table (table 5.16) stated that majority of the household (n=141; 94.0%) had no person with disability followed by person with disability in the household (n=09; 6.0%).

*Table 56: Person with disability affected by the flood*

| Reasons | No. of respondents | Percentage (%) |
|---|---|---|
| Unable to move elsewhere | 02 | 22.2% |
| Suffered from anxiety and insecurity | 01 | 11.1% |
| Faced difficulties in getting food, shelter, and healthcare | 03 | 33.3% |
| Unable to cope with surrounding environment | 03 | 33.3% |
| **Total** | **09** | **100%** |

The above table (table 5.17) stated that most of the person with disability (n=03; 33.3%) were affected by difficulties in getting food, shelter, and healthcare followed by unable to cope with surrounding environment (n=03; 33.3%), unable to move elsewhere (n=02; 22.2%) and suffered from anxiety and insecurity (n=01; 11.1%).

*Table 57: Movement status of person with disability during flood*

| **Movement status of Person with disability** | **No. of respondents** | **Percentage (%)** |
|---|---|---|
| To shelter | 02 | 22.2% |
| To safe place nearby | 07 | 77.8% |
| **Total** | **09** | **100%** |

The above table (table 5.18) explains the role of family to move the person with disability during flood. Majority of respondent (n=07; 77.8%) stated that they managed safe places nearby followed by move only to shelter (n=02; 22.2%).

*Table 58: Distribution of elderly people in the household*

| **Elderly people in the household** | **No. of respondents** | **Percentage (%)** |
|---|---|---|
| Yes | 70 | 46.7% |
| No | 80 | 53.3% |
| **Total** | **150** | **100%** |

The above table (table 5.19) stated that most of the household (n=70; 46.7%) had elderly people. 53.3% (n=80) of households had no elderly member.

*Table 59: Elderly person affected by the flood*

| **Reasons** | **No. of respondents** | **Percentage (%)** |
|---|---|---|
| Unable to move elsewhere | 12 | 17.1% |
| Suffered from anxiety and insecurity | 12 | 17.1% |
| Faced difficulties in getting food, shelter, and healthcare | 14 | 20.0% |
| Unable to cope with surrounding environment | 32 | 45.7% |
| **Total** | **70** | **100%** |

The above table (table 5.20) stated that most of the elderly people (n=32; 45.7%) were unable to cope with surrounding environment followed by Faced difficulties in getting food, shelter, and healthcare (n=14; 20.0%), unable to move elsewhere (n=12; 17.1%) and suffered from anxiety and insecurity (n=12; 17.1%).

Only five respondents expressed about general scenario for intersectional community inside the shelter premises. One respondent stated that it was peaceful, another viewed quarrelling, another stated quarrelling for relief, another mentioned quarrelling as well as alcoholism issues and another expressed various types of issues.

*Table 60: Seen any changes over time in terms of awareness, acceptability and accessibility*

| **Seen any changes** | **No. of respondents** | **Percentage (%)** |
|---|---|---|
| Yes | 07 | 4.7% |
| No | 143 | 95.3% |
| **Total** | **150** | **100%** |

The above table (table 5.21) stated that majority of the household (n=143; 95.3%) were not seen any changes over time in terms of awareness, acceptability and accessibility. Only 4.7% (n=07) seen any changes over time in terms of awareness, acceptability and accessibility. Out of these seven respondents only four has explained the phenomenon and these are respectively (a) having idea that how to save people; (b) people tried to help each other; (c) fuel, medicine and important document should have kept safely; and (d) need to move to safe places and should keep emergency numbers.

*Table 61: Comparison for section E*

| **Aspect** | **Case A: North-East Bangladesh** | **Case B: Barak Valley, Assam, India** | **Comments** |
|---|---|---|---|
| Types of Shelter Used | Mostly academic institutions | Various, including academic institutes, relatives' houses, and marketplaces | Both regions used academic institutions, but Case B has a wider variety of shelters. |
| Safety and Security for Women in Shelters | 70% indicated shelters were safe for women | 86% felt shelters were safe for women and adolescent girls | A higher percentage in Case B felt the shelters were safe for women. |

| | | | |
|---|---|---|---|
| Harassment During Flood | 5% reported harassment | 2% reported harassment | Both cases reported low but significant instances of harassment. |
| Menstrual and Maternal Health | Challenges in managing menstrual health | Majority used sanitary pads, others used clean or recyclable cloths | Case B shows a higher use of sanitary pads, suggesting better access to menstrual hygiene products. |
| Pregnant and Lactating Women | 8% had pregnant women, 80% had no lactating mothers | 6.7% had pregnant women, 5.3% had lactating mothers | Similar low percentages of pregnant and lactating women in both cases. |
| Challenges for Vulnerable Groups | Significant displacement, lack of access to safe water and sanitation | Challenges in movement, food, shelter, and healthcare for people with disabilities and the elderly | Both cases highlight significant challenges for vulnerable groups, with Case B providing more detailed insights. |
| Awareness, Acceptability, and Accessibility Changes | Not mentioned | 95.3% saw no changes in terms of awareness, acceptability, and accessibility | Case B indicates a lack of perceived change in awareness and accessibility. |

## Section F: Impact on Education (Case A)

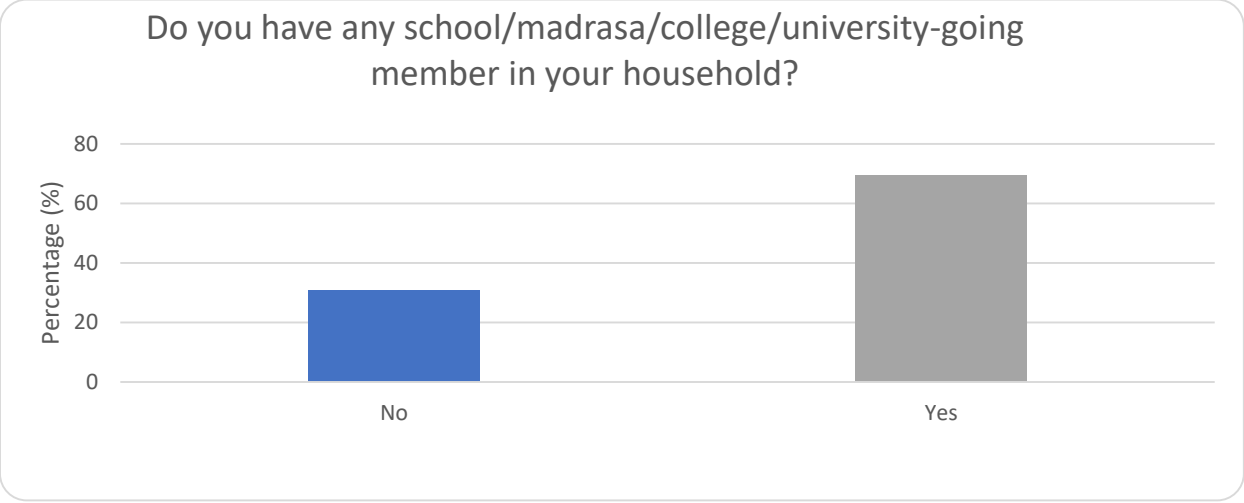


*Figure 25: Percentage distribution of members in the households attaining education*

Approximately 70% of the respondents replied in the affirmative while being asked about having any school/madrasa/college/university-going member in their families. The rest of the respondents of the study, however, stated otherwise. (See Table 24)

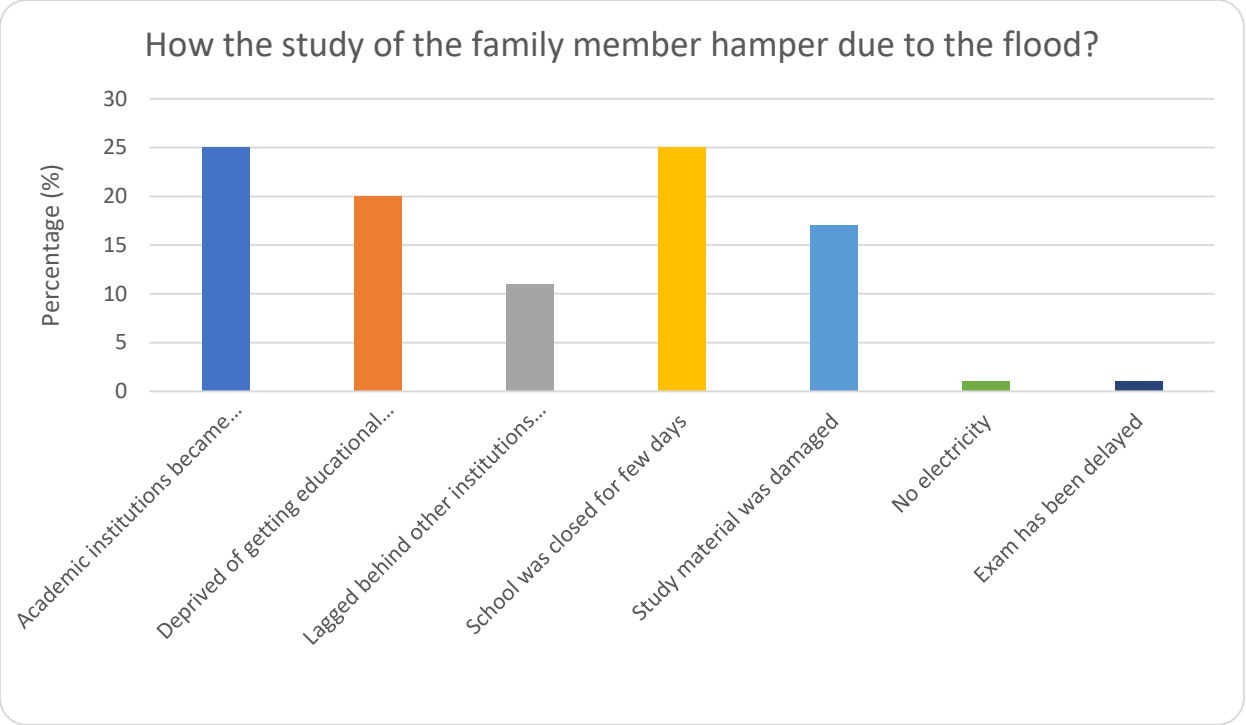


*Figure 26: Challenges towards education due to flood*

The graph depicts the ways the flood had an impact on the education of the respondents' school/college/madrasa/university-going family members. Academic institutions being closed and used as shelters were the primary ways flood impacted education in that regions, as stated by about 50% of the respondents. 20% of them claimed that not receiving any educational support from external sources impacted the education of their family members. Study materials getting ruined by the floodwater was stated as a factor by at least 17% of the respondents. More than 10% of respondents stated that the schools that were not affected by the flood continued with their curriculum, causing the schools that were affected to fall behind. Some responses also highlighted the lack of electricity and the delayed examination schedule as the reasons. (See Table 25)

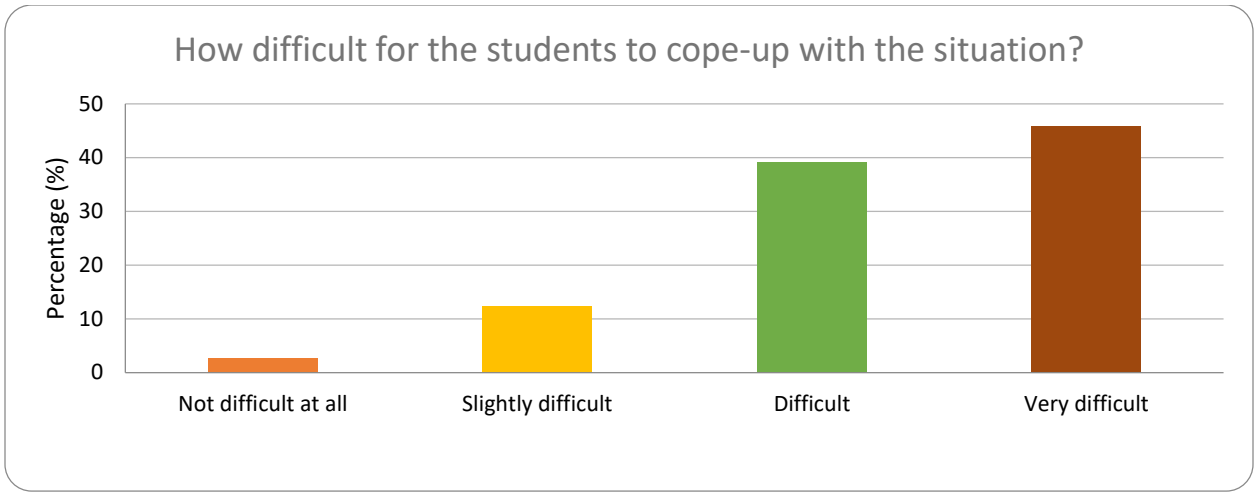


*Figure 27: Students' level of difficulty in coping with the situation*

According to at least 46% of respondents, it was very difficult for the students to deal with the aftermath of the disastrous flood. While 40% indicated it was challenging for the students, 10% or more said the situation made it somewhat difficult for them to cope. Yet, a tiny proportion of respondents indicated that it was not at all challenging for the students. (See Table 26)

**Section F: Impact on Education (Case B)**

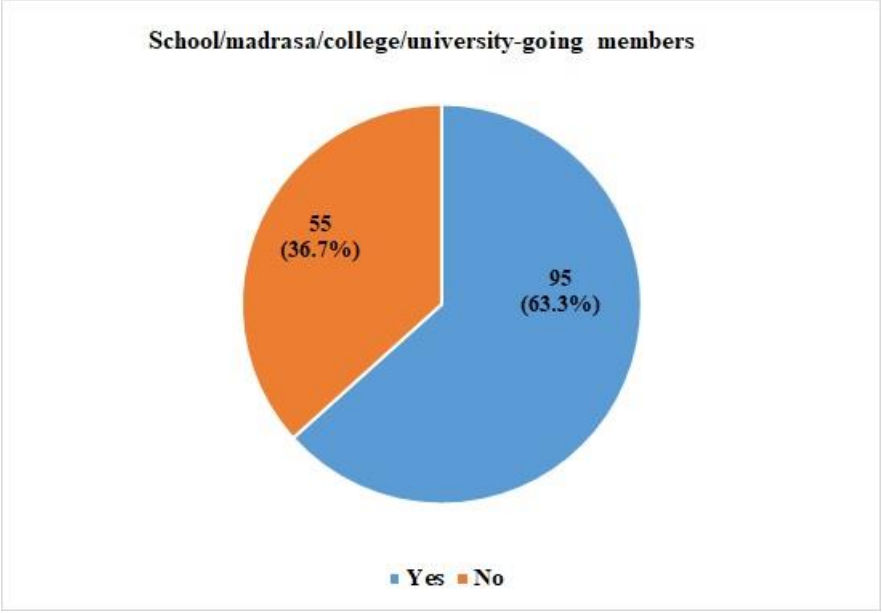


*Figure 28: Distribution of school/madrasa/college/university-going member in the household*

The above figure (figure/diagram 6.1) stated that majority of household (n=95; 63.3%) had school/madrasa/college/university going members and rest (n=55; 36.7%) stated no such types of members at household.

*Table 62: Study of family members hampered due to the flood*

| **Reasons** | **No. of respondents** | **Percentage (%)** |
|---|---|---|
| Unable to go to school/madrasa/college/university | 59 | 62.1% |
| Academic institutions became shelter and students refrained from going to school | 31 | 32.6% |
| Deprived of getting educational support | 01 | 1.1% |
| Lagged behind other institutions which are not affected | 04 | 4.2% |
| Others | - | - |
| **Total** | **95** | **100%** |

The above table (table 6.1) shows various reasons that how the study of family members was hampered due to flood. Majority of the respondents (n=59; 62.1%) stated that their child/family members were unable to go to school/madrasa/college/university and here the common reasons were (a) flood destroyed institutions, and (c) high volume of water on road side. 32.6% (n=31) stated that academic institutions became shelter and students refrained from going to school; 4.2% (n=04) stated that the family members were lagged behind other institutions which are not affected; and 1.1% (n=01) stated deprived of getting educational support.

*Table 63: Difficulties for the student to cope-up with the situation*

| **Status to cope-up with the situation** | **No. of respondents** | **Percentage (%)** |
|---|---|---|
| Not difficult at all | 04 | 4.2% |
| Slightly difficult | 15 | 15.8% |
| Difficult | 47 | 49.5% |
| Very difficult | 29 | 30.5% |
| **Total** | **95** | **100%** |

The above table (table 6.2) shows the difficulties for the student to cope-up with the situation. Most of the respondents (n=47; 49.5%) stated difficulty for the student to cope up with situation followed by very difficult (n=29; 30.5%), slightly difficult (n=15; 15.8%) and not difficult at all (n=04; 4.2%).

*Table 64: Comparison for section F*

| Aspect | Case A: North-East Bangladesh | Case B: Barak Valley, Assam, India | Comments |
|---|---|---|---|
| Households with Education-Attending Members | 70% had members in education | 63.3% had members in education | Slightly more households in Case A reported having members attending educational institutions. |
| Primary Challenges to Education Due to Flood | - Academic institutions closed/used as shelters<br>- Lack of external educational support<br>- Study materials ruined | - Inability to attend institutions<br>- Institutions used as shelters<br>- Lagging behind unaffected institutions | Both regions faced similar primary challenges, with closures of institutions being a common issue. |
| Difficulty for Students to Cope | - 46% very difficult<br>- 40% challenging<br>- 10% somewhat difficult | - 49.5% difficult<br>- 30.5% very difficult<br>- 15.8% slightly difficult<br>- 4.2% not difficult at all | Students in both regions found it challenging to cope, with a higher percentage in Case B finding it 'very difficult'. |

## Section G: Impact on Health (Case A)

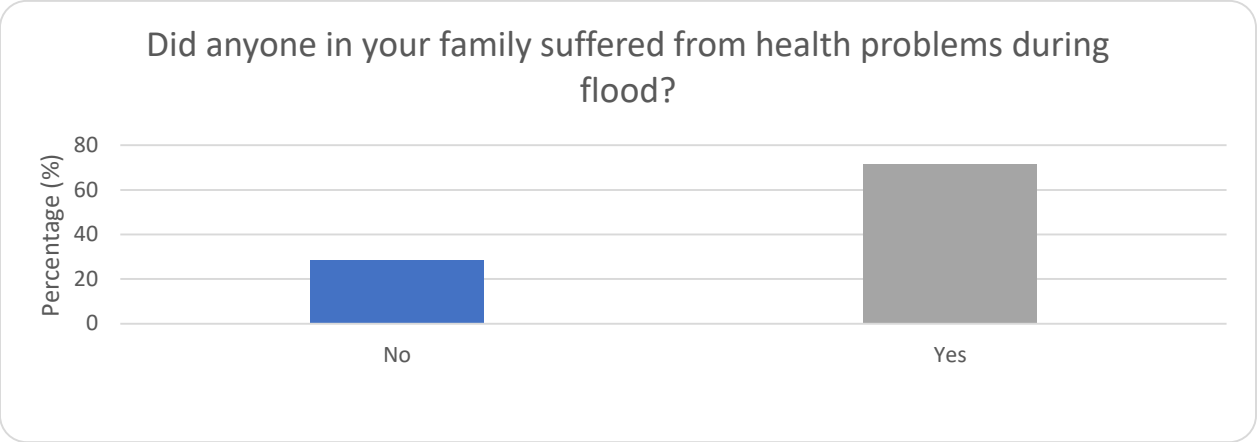


*Figure 29: Percentage distribution of family members suffering from health problems in the households of the respondents*

Health-related problems can become prevalent during and aftermath of a flood and the scenario for the 2022 flood was not any different either. More than 70% of the respondents stated that they or their family members did suffer from health problems during the flood whereas nearly 30% of them stated otherwise. (See Table 27)

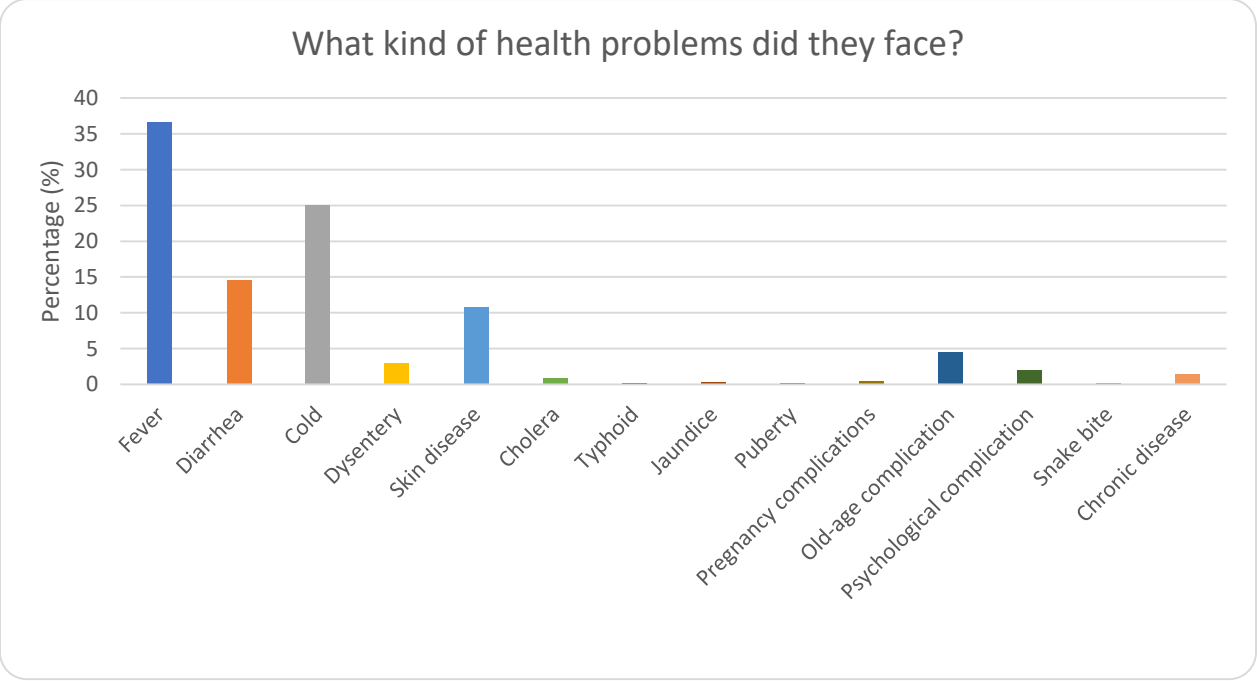


*Figure 30: Percentage distribution of health-related problems faced by the respondents*

When asked about health problems it was found that fever, diarrhea, skin diseases and cold-related problems were more prominent than other health-related problems. Nearly 37% of

the respondents expressed that they contracted fever and 15% said they had diarrhoea during the flood. About 25% of the respondents suffered from cold-related problems whereas skin diseases were common for about 11% of the respondents. Moreover, Cholera, typhoid, jaundice, puberty, pregnancy complications, old-age-related problems, psychological breakdowns, and snake bites were mentioned by a few respondents of the survey. (See Table 28)

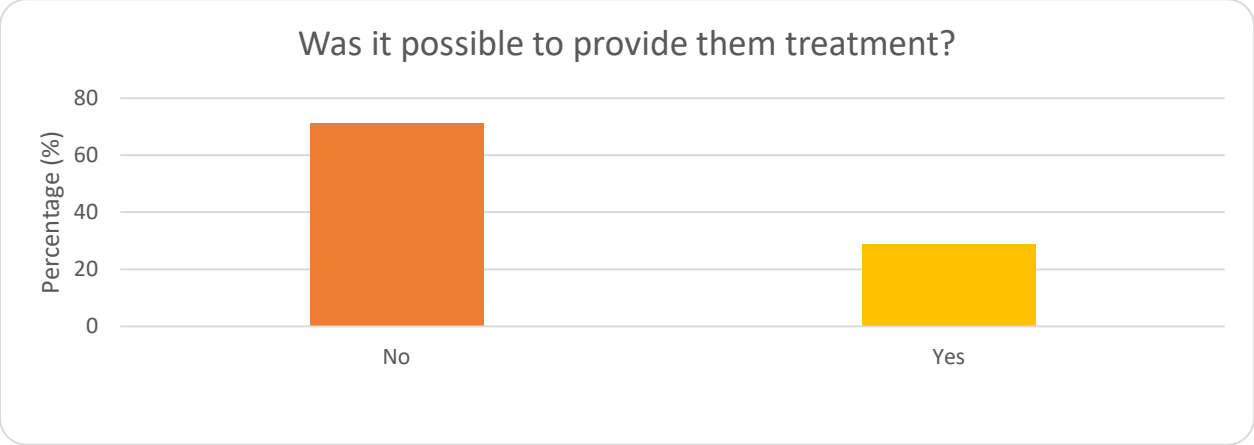


*Figure 31: Treatment facilities during the flood*

Floods can lead to difficulties in receiving treatments which were evident this around as well since 71% of the respondents retorted that it was nearly impossible to provide the patient with proper treatments while over 20% of them replied that it was possible for them to arrange treatments for the patients. (See Table 29)

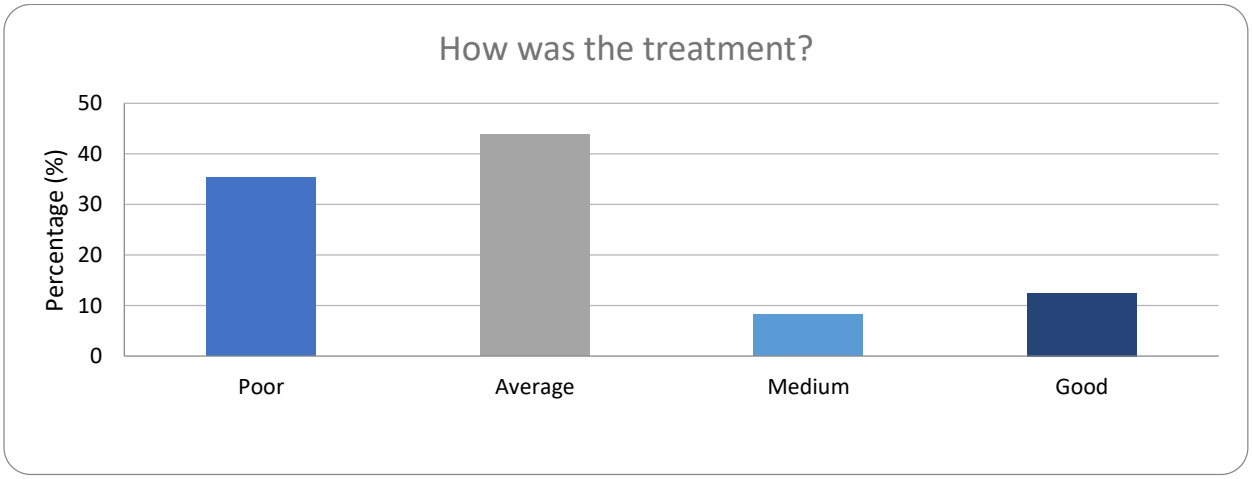


*Figure 32: Quality of medical treatment during the flood*

Those who could receive treatments were asked afterwards regarding the quality of the treatment they had availed. 43% of the respondents answered that the quality of the

treatment they received was not more than average. However, 35% thought the treatment was considerably poor followed by 8% who said it was medium in quality. Just over 10% of the respondents considered the treatment they received to be good. (See Table 30)

Regarding the emerging issues of access to reproductive health services, from the secondary analysis, it is estimated that 60,000 women are currently pregnant in Sunamgnaj and Sylhet districts. More than 6,500 births are expected to take place in July 2022 and more than 20,000 births will take place in September 2022. According to the Situation update by Nutrition Cluster, approximately 21,200 pregnant and lactating women will be out of nutrition services. The flood had a significant impact on health facilities at the Upazila level, including the Upazila Health Complex, Community Clinic and Union Health and Family Welfare Centre. Considering SUnamganj, the district has one of the poorest rates of antenatal care (29.6 per cent), and it is completely submerged and disconnected. Nevertheless, these results are in good agreement with the relevant action research's source data.

## Section G: Impact on Health (Case B)

*Table 65: Family suffered from health problems*

| **Family suffered from health problems** | **No. of respondents** | **Percentage (%)** |
|---|---|---|
| Yes | 95 | 63.3% |
| No | 55 | 36.7% |
| **Total** | **150** | **100%** |

The above table (table 7.1) shows that majority of family (n=95; 63.3%) had suffered from health problems followed by family who were not suffered from health problems (n=55; 36.7%).

*Table 66: Family suffered from health problems*

| **Family suffered from health problems (Count % in column)** | **Gender** | | **Total (%)** |
|---|---|---|---|
| | **Male (%)** | **Female (%)** | |
| Yes | 58 (61.7%) | 37 (66.1%) | 95 (63.3%) |
| No | 36 (38.3%) | 19 (33.9%) | 55 (36.7%) |

| | | | |
|---|---|---|---|
| **Grand Total** | **94 (100%)** | **56 (100%)** | **150 (100%)** |

The above table (table 7.2) shows that majority (n=58; 61.7%) of males stated that their family members were suffered from health problems. Similarly, majority of females (n=37; 66.1%) stated that their family members were suffered from health problems.

*Table 67: Chi square table for gender and family suffered from health problems*

| **Variable** | ***X²*** | ***df*** | ***p Value*** |
|---|---|---|---|
| Gender and family suffered from health problems | 0.288 | 01 | 0.591 |

Note- Significant p Value = 0.05

The above chi square table (table 7.3) stated that gender and family suffered from health problems ($X^2$= 0.288, *df* = 1, p = 0.591) was statistically insignificant.

*Table 68: Type of health issues that family faced*

| **Type of health issues** | **No. of respondents** | **Percentage (%)** |
|---|---|---|
| Fever | 03 | 3.2% |
| Dysentery | 01 | 1.1% |
| Skin disease | 03 | 3.2% |
| Pregnancy complication | 01 | 1.1% |
| Old-age complication | 09 | 9.5% |
| Chronic disease | 04 | 4.2% |
| Fever & Cold | 28 | 29.5% |
| Cold, cough & old age complication | 07 | 7.4% |
| Fever, cough & skin disease | 21 | 22.1% |
| Fever, dysentery, skin disease and old age complication | 05 | 5.3% |
| Fever & skin disease | 03 | 3.2% |
| Fever, Dysentery & Skin disease | 03 | 3.2% |
| Fever, diarrhoea, cold & skin disease | 04 | 4.2% |
| Fever, cough and dysentery | 02 | 2.1% |
| Fever, pregnancy & old-age | 01 | 1.1% |
| **Total** | **95** | **100%** |

The above table (table 7.4) shows the types of health issues that family faced. Most of the family (n=28; 29.5%) had suffered the health issues of fever and cold followed by fever, cough & dysentery (n=21; 22.1%), old-age complication (n=09; 9.5%), and other different kinds of health issues.

*Table 69: Possibility to provide treatment*

| **Possibility to provide treatment** | **No. of respondents** | **Percentage (%)** |
|---|---|---|
| Yes | 56 | 58.9% |
| No | 39 | 41.1% |
| **Total** | **95** | **100%** |

The above table (table 7.5) shows that majority of the respondent (n=56; 58.9%) stated that it was possible to provide treatment for their family members followed by no possibilities at all (n=39; 41.1%).

*Table 70: Status of treatment*

| **Treatment status** | **No. of respondents** | **Percentage (%)** |
|---|---|---|
| Pharmacy & effective treatment from doctors | 03 | 5.4% |
| Medicine took from Pharmacy | 09 | 16.1% |
| PHC medicine | 05 | 8.9% |
| Private NGOs | 01 | 1.8% |
| Private clinic | 04 | 7.1% |
| Government medical facilities were helpful | 33 | 60.7% |
| **Total** | **56** | **100%** |

The above table (table 7.6) shows the status of treatment where majority of the respondent (n=33; 58.9%) expressed that government medical facilities were helpful followed by medicine took from pharmacy (n=09; 16.1%), PHC medicine (n=05; 8.9%), private clinic (n=04; 7.1%), pharmacy & effective treatment from doctor (n=03; 5.4%), and private NGOs (n=01; 1.8%).

*Table 71: Comparison table for section G*

| Aspect | Case A: North-East Bangladesh | Case B: Barak Valley, Assam, India | Comments |
|---|---|---|---|
| Family Members Suffering from Health Problems | 70% reported health issues | 63.3% reported health issues | A slightly higher percentage in Case A reported health problems. |
| Types of Health-Related Problems Faced | Fever, diarrhea, skin diseases, cold, cholera, typhoid, jaundice | Varied, including fever, cold, old-age complications, skin diseases | Both cases reported a range of health problems, with fever and skin diseases common in both. |
| Treatment Facilities During Flood | 71% found it nearly impossible to provide proper treatment | 58.9% stated it was possible to provide treatment | Better treatment accessibility reported in Case B. |
| Quality of Medical Treatment | 43% rated treatment as average; 35% as poor | Majority found government medical facilities helpful | Case B reports more positive responses regarding the quality of medical treatment. |
| Impact on Reproductive Health Services | Significant impact, with high numbers of pregnant women and challenges in antenatal care | Not mentioned | Specific data on reproductive health services provided only for Case A. |

## Section H: Flash Flood Response (Case A)

### Section H.1: Shelters and Facilties

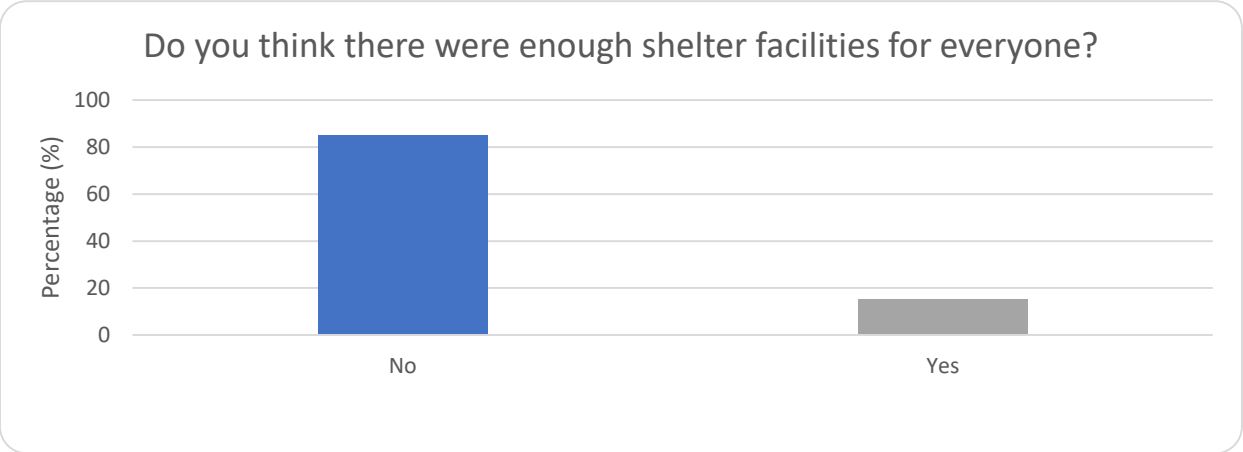


*Table 72: Extent of shelter facilities in the flood affected areas*

More than 80% of the respondents thought that the existing shelter facilities were sufficient for the flood affected population whereas the remainder portion of the respondents of the study stated the opposite. (See Table 31)

*Figure 33: Extent of shelter facilities in the flood affected areas*

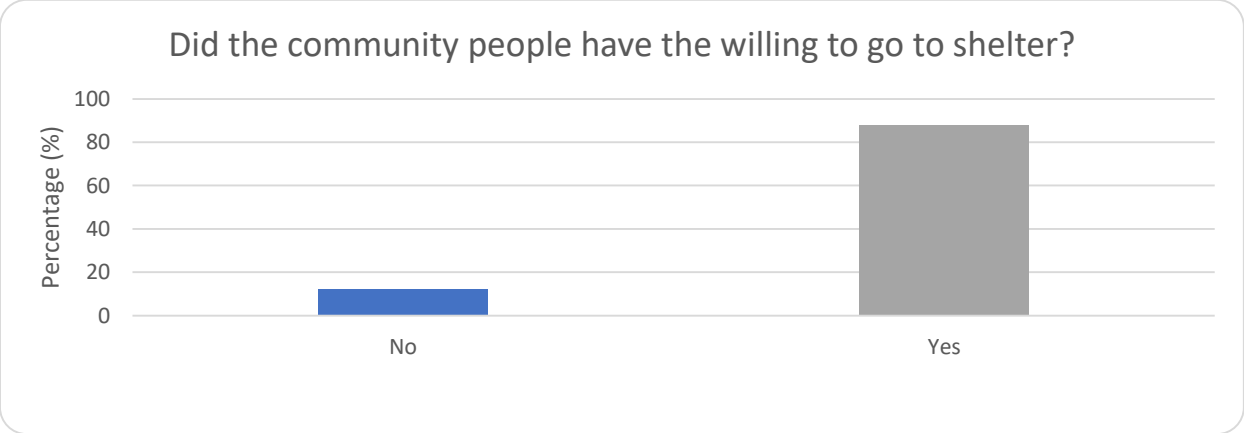


*Figure 32: Community people's willingness in relocating themselves to nearby shelters*

The study sought to determine whether the affected people voluntarily evacuated to shelters in the midst of the catastrophic storm, and 88 percent of respondents indicated that they did so to escape the floodwaters. However, over 10% said they didn't want to leave their home and move to shelter. They went to the shelter against their will. (See Table 32)

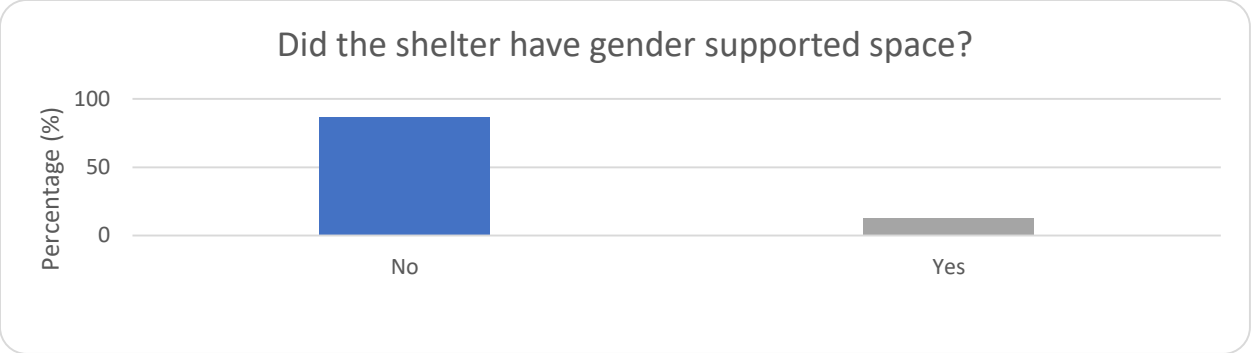


*Figure 34 : Availability of gender-supported space in the shelters*

When asked if the shelters had gender-supportive spaces, 87% of the people who took part in the study said that they hadn't observed any during their stay in the shelters. The rest of the respondents said that the shelters did have gender-supportive spaces. (See Table 33)

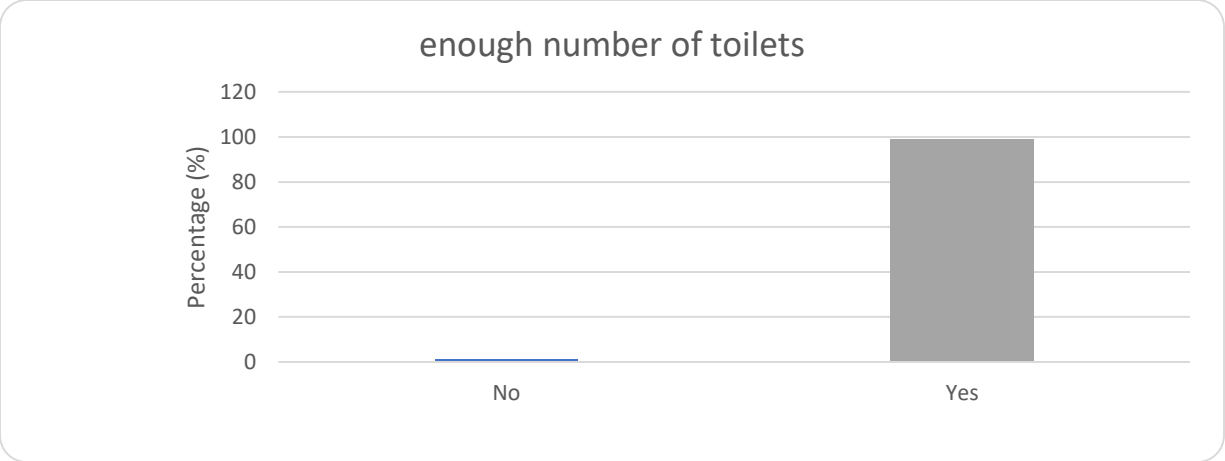


*Figure 35: Respondents' account regarding the quantity of toilets in the shelters*

Nearly all the respondents felt that the number of toilets in the shelters they took refuge during the devastating flood was enough for them. Only a few of them didn't agree with the statement (See Table 34).

## Section H.2: Medical Services in the Shelters

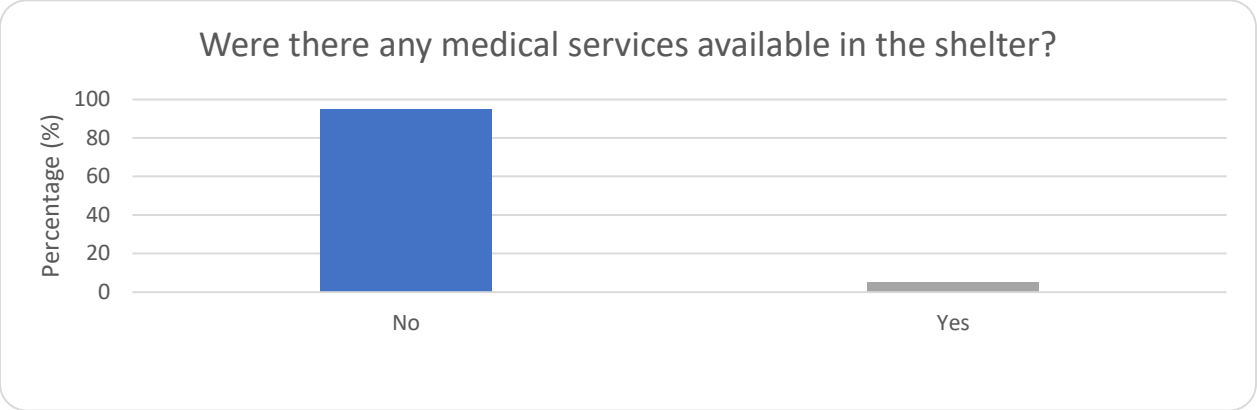


*Figure 36: Availability of medical services in the shelter*

A staggering 95% of the respondents expressed their disappointment for not being able to access any medical service in the shelter. There were not any medical services available in the shelters according them. Only a negligible portion of the respondents said that there were medical services available in their shelters. (See Table 35)

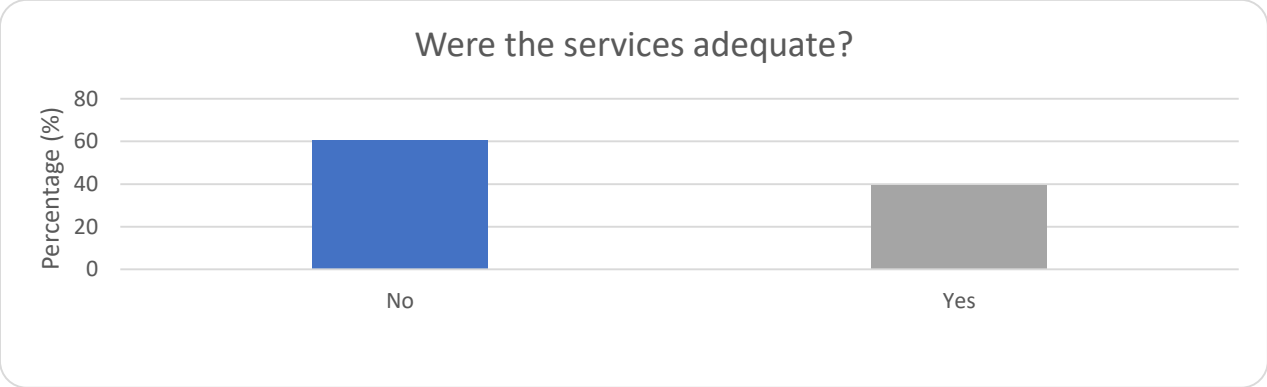


*Figure 37: Extent and quality of medical services in the shelters*

Those among the respondents who came across existing medical services in the shelters were then asked about the quality of the service and majority of them, approximately 60% said, the service was never adequate to meet the increasing demands. The rest 40% of the respondents, however, felt that the medical service was adequate in the shelters. (See Table 36)

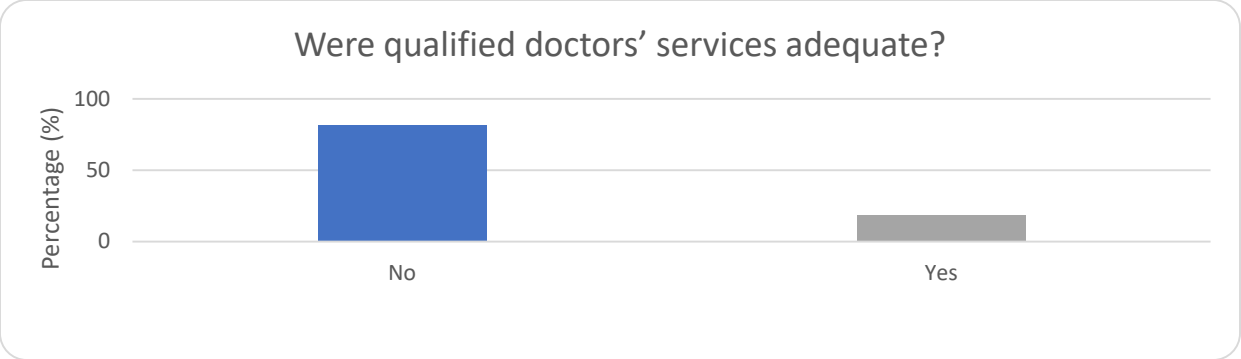


*Figure 38: Extent and quality of doctors' services in the shelters*

The respondents who availed the medical services were also asked regarding the services the qualified doctors provided in the shelters. More than 80% of them found the services adequate while the rest of the respondents felt that qualified doctors' service was inadequate considering the demands. (See Table 37)

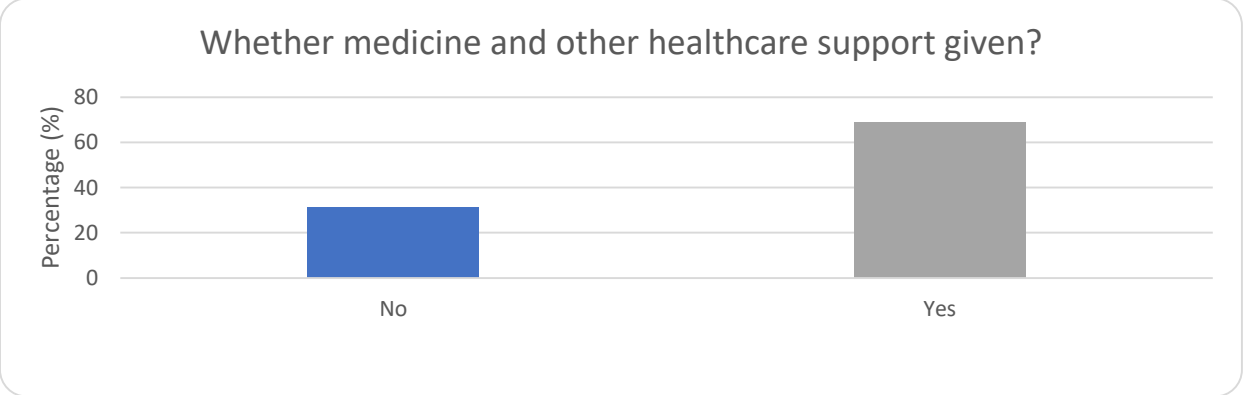


*Figure 39: Extent of medicine and healthcare support given to the flood affected people*

The respondents who utilized the healthcare facilities in the shelters were asked if the service included medicines and other important healthcare support and nearly 70% of them provided positive feedback and said they were given the required medicines and other support that they needed. The rest of the respondents stated in the opposite. (See Table 38)

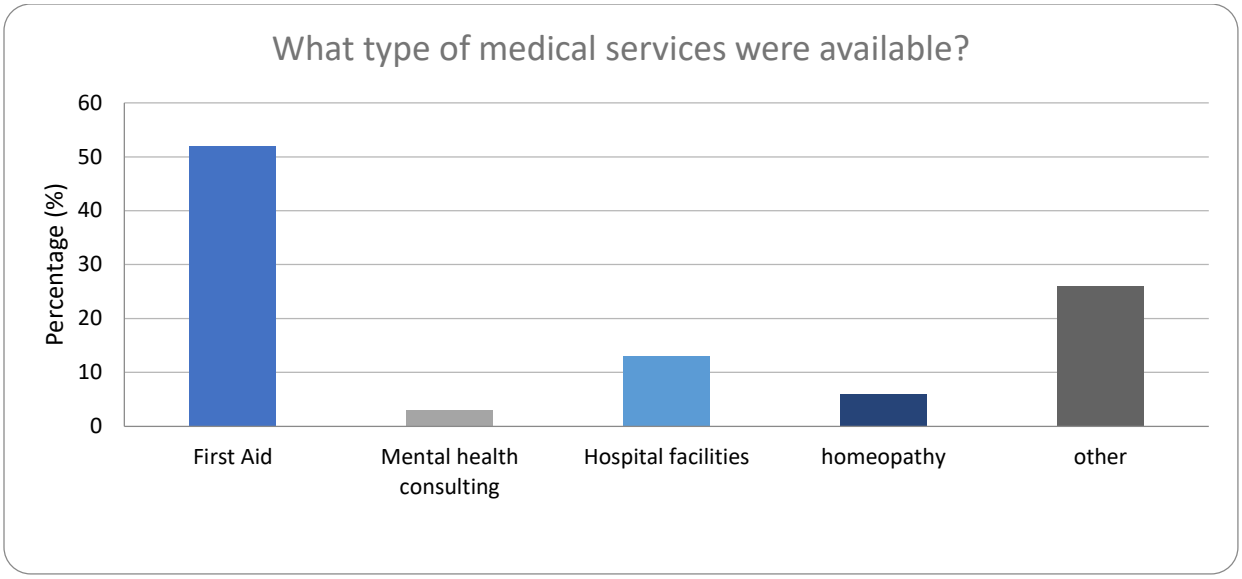


*Figure 40: Availability of different types of medical services during the flood*

At least half of the respondents who utilized the healthcare facilities indicated that first aid was accessible for them. Around 10% of respondents indicated that hospital-related facilities are available in their localities. A very few of them stated about mental health counselling and homeopathy being available. And the rest of the respondents mentioned other types of medical services which were available for them during the flood. (See Table 39)

## Section H.3: Relief Distribution

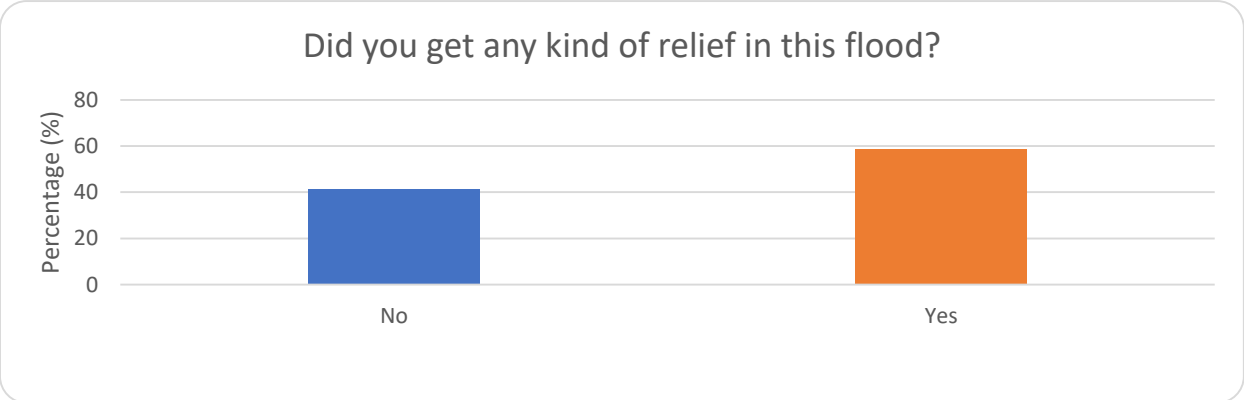


*Figure 41: Percentage distribution of respondents based on relief procurement*

As floodwaters trapped millions of people in Bangladesh's northeastern area, the cries for relief became louder with each passing day. Special allocations were made for the flood affected populace from the government fund. Numerous non-government organizations stepped up as well. When asked if they received any such relief during the flood, nearly 59%

replied in the affirmative while over 40% of respondents indicated they did not receive any assistance from anyone. (See Table 40)

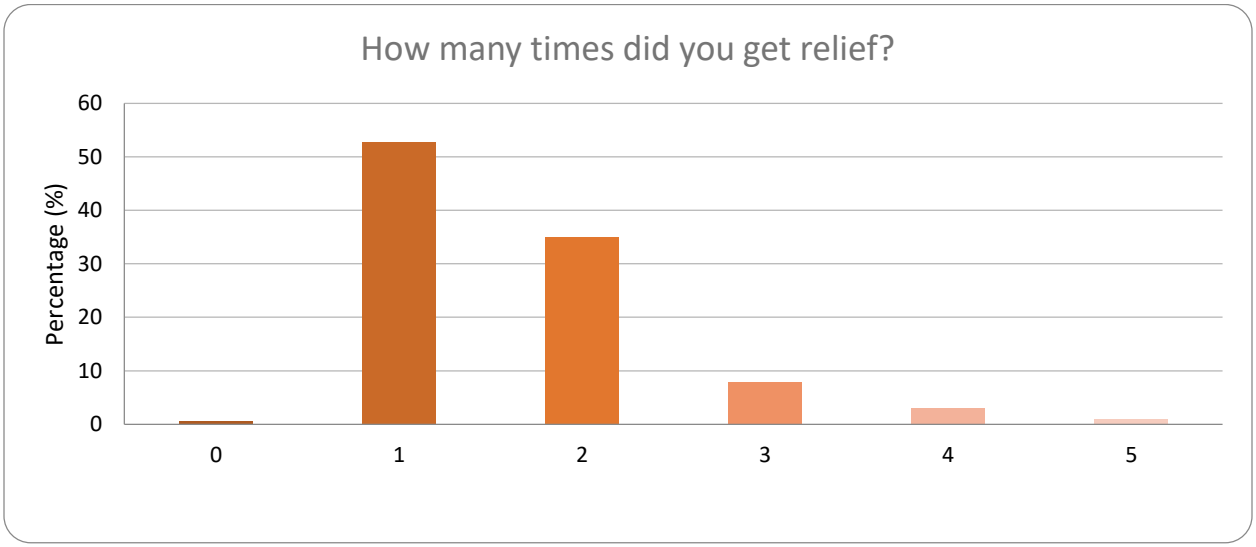


*Figure 42: Percentage distribution of the respondents based on the number of times they received flood relief*

The majority of respondents, over fifty percent, who received flood relief only received it once, while thirty-five percent reported receiving it twice. At least 8% of the study's respondents, however, received relief three times during the flood. A tiny percentage of responders received relief items four or even five times during the flood. Just 1% of respondents indicated they received no flood relief whatsoever. (See Table 41)

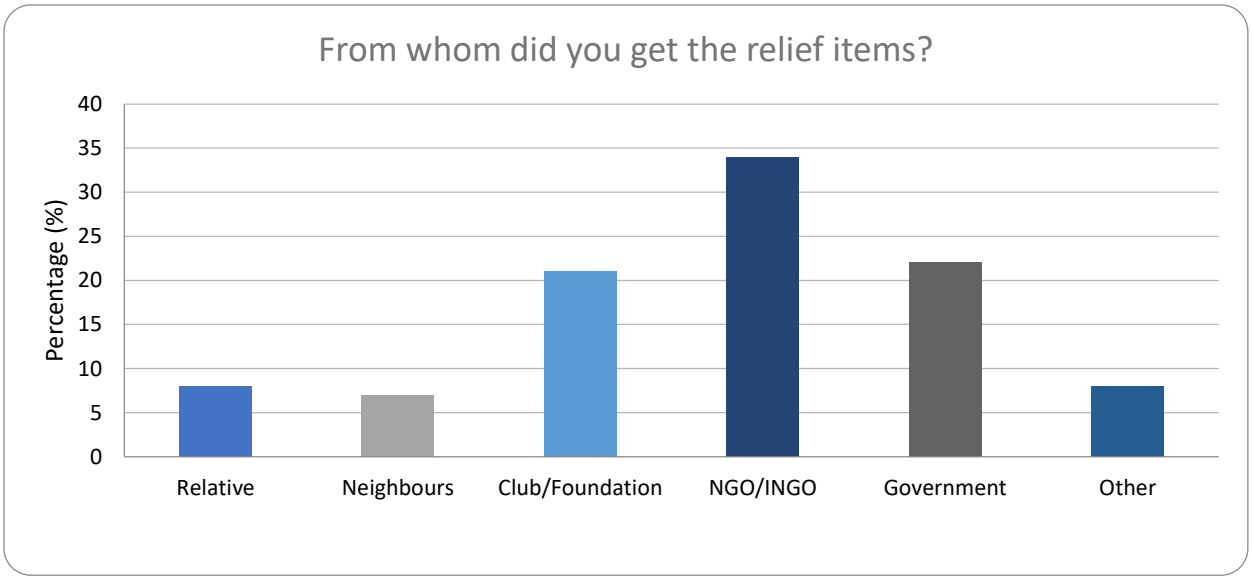


*Figure 43: List of relief providers during the flood*

34% of the respondents who received relief items during the food stated that it was NGOs and INGOs who stepped up to provide them with such assistance whereas, 22% of the respondents said they got the relief from the government. More than 20% stated various clubs and foundations who were present in the flood affected areas and provided supported to the flood affected populace. A few of the respondents also said that they received relief items from their relatives and even from neighbours as well while the rest of the respondents mentioned other source where they got the relief from. (See Table 42)

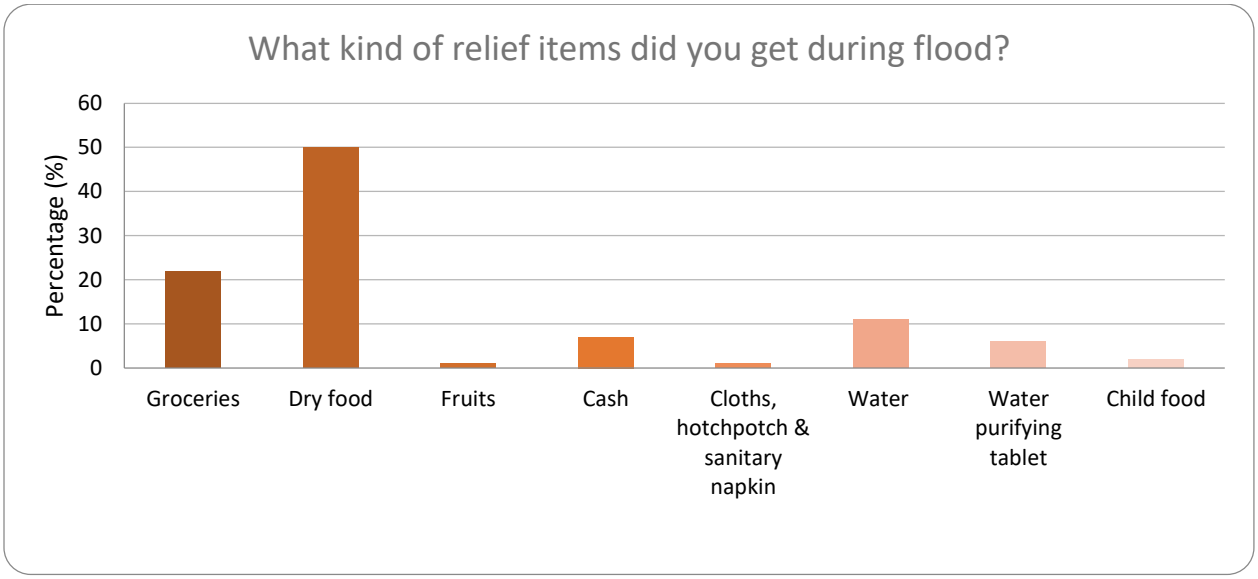


*Figure 44: Types of relief items received by the respondents during the flood*

The most common type of relief item distributed to flood-affected populations was dry food. The majority of responders, at least half of them who received relief products during the flood reported receiving dry foods. While 22% of respondents reported they received grocery items as flood relief, just over 10% said they received water. Also, at least 6% of the responders received water purification tablets. 7% of them reported receiving cash as a kind of aid, while a few also received fruits, child food, clothing, sanitary pads, etc. (See Table 43)

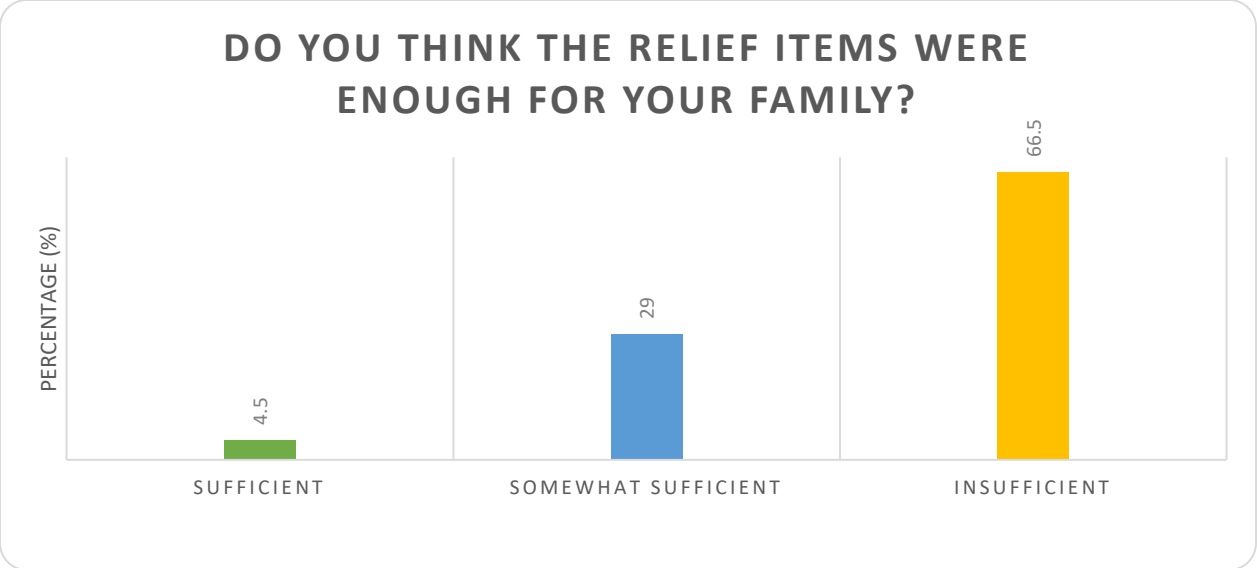


*Figure 45: Amount of relief given to the flood affected people*

People who were affected by the flood and received relief from different organizations were asked whether the relief they had received were enough and more than 66% of them felt the supply of relief was inadequate, while 29% of respondents were unsatisfied but indicated that the relief was at least somewhat sufficient. The remaining responders, who made up no more than 5% of the total, were content and said the relief supplies were adequate. (See Table 44)

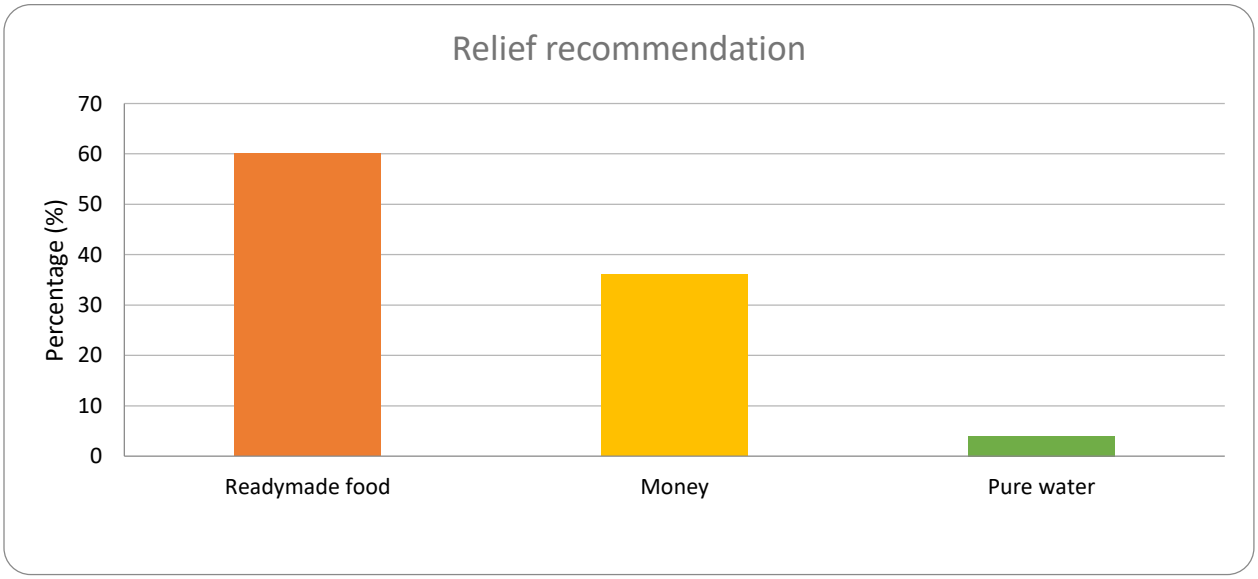


*Figure 46: Recommendations of the respondents regarding flood relief*

When asked to provide recommendations about relief supplies, approximately 60% of the respondents gave readymade food a preference over any relief items, while monetary assistance was preferred by 36% of the respondents. The remaining responses suggested that pure drinking water should be on the priority list of relief items. (See Table 45)

## Section H.4: Support for Reconstruction and Rehabilitation

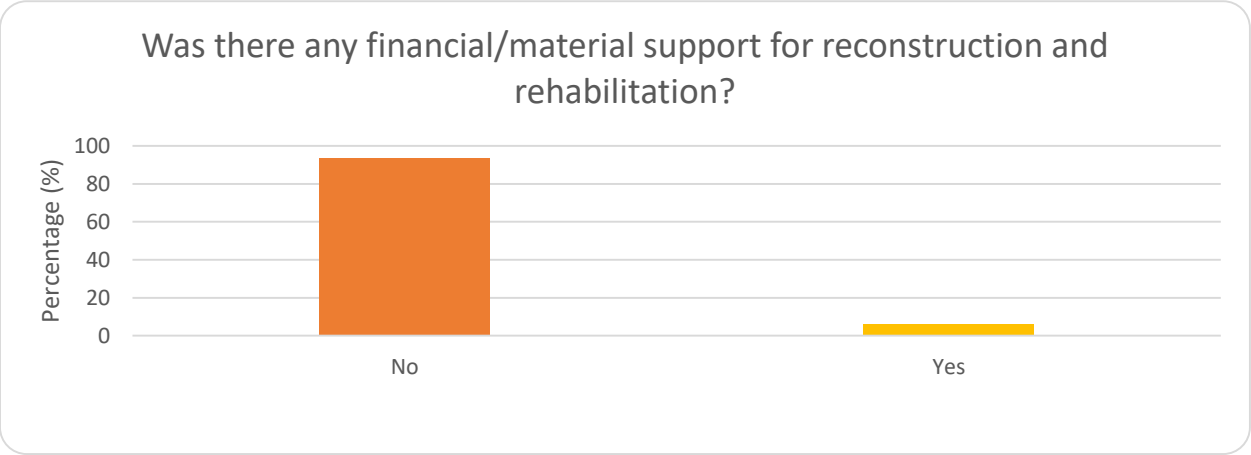


*Figure 47: Extent of financial/material support for reconstruction and rehabilitation*

Reconstruction and rehabilitation are crucial in the aftermath of a flood to help the affected community recover from the shocks. But, 94% of respondents who took part in the study claimed that they didn't receive any financial or material support for reconstruction and rehabilitation whatsoever. The rest 6% of them stated the opposite and said they indeed received such assistance. (See Table 46)

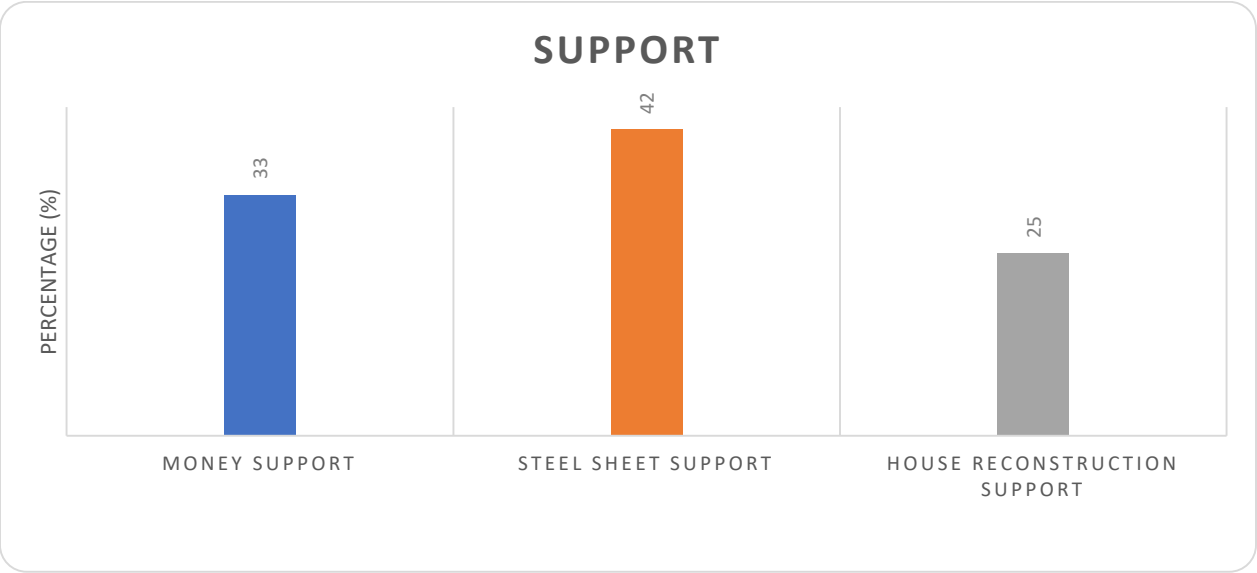

*Figure 48: Types of support flood affected people received after the flood*

42% of the respondents who received support for reconstruction and rehabilitation received steel sheets, while 33% reported getting monetary support. Other 25% of the respondents reported receiving house reconstruction assistance. (See Table 47)

## Section H.5: Challenges faced during the flood

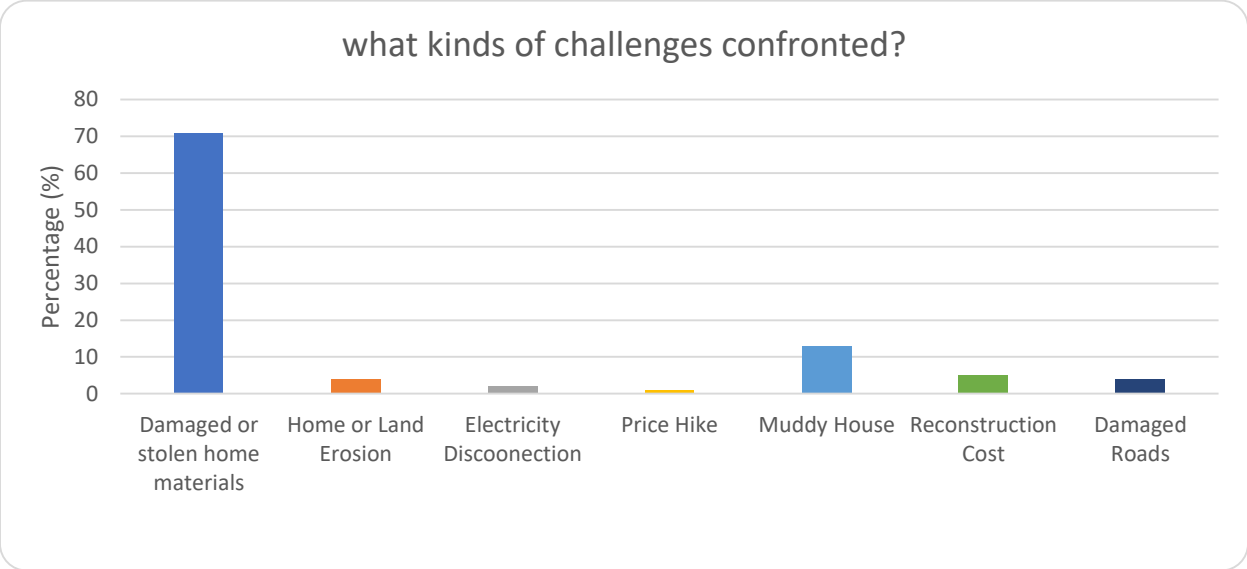


*Figure 49: Types of challenges confronted by the flood affected population*

On returning home after the flood water receded, damaged or stolen home materials was the most distressing challenge the flood affected people faced as stated by over 70% of the study participants. Nearly 13% of the respondents who had muddy houses experienced difficulties as the houses were collapsed or washed away by swift current. Challenges like home or land erosion, electricity disconnection, price hike, reconstruction cost, damaged roads, etc. were also mentioned by a few of the respondents. (See Table 48).

## Section H: Flash Flood Response (Case B)

*Table 73: Enough shelter facilities for everyone*

| **Enough shelter facilities for everyone** | **No. of respondents** | **Percentage (%)** |
|---|---|---|
| Yes | 86 | 57.3% |
| No | 56 | 37.3% |
| No response | 08 | 5.3% |
| **Total** | **150** | **100%** |

The above table (table 8.1) depict the idea about enough shelter for everyone. Majority of the respondent (n=86; 57.3%) expressed that there were enough shelter facilities followed by not enough shelter facilities (n=56; 37.3%) and no response (n=08; 5.3%).

*Table 74: Community people have the willing to go to shelter*

| **Community people willingness** | **No. of respondents** | **Percentage (%)** |
|---|---|---|
| Yes | 101 | 67.3% |
| No | 40 | 26.7% |
| No response | 09 | 6.0% |
| **Total** | **150** | **100%** |

The above table (table 8.2) shows the community people willingness to go to shelter. Majority of the respondent (n=100; 67.3%) expressed that community people were willing to go to shelter followed by non-willingness (n=41; 26.7%) and no response (n=09; 6.0%).

*Table 75: Facilities were missing inside the shelter*

| **Facilities missing inside shelter** | **No. of respondents** | **Percentage (%)** |
|---|---|---|
| Clean drinking water, electricity & less space | 45 | 44.6% |
| Water & Electricity | 03 | 3.0% |
| Oil & soap | 01 | 1.0% |
| Lack of mosquito net and light | 01 | 1.0% |
| Personal space & electricity | 16 | 15.8% |
| Nothing so far | 01 | 1.0% |
| Medical Aid | 21 | 20.8% |
| Unable to use washroom | 02 | 2.0% |
| No response | 11 | 10.9% |
| **Total** | **101** | **100%** |

The above table (table 8.3) shows the facilities missing inside shelter. Most of the respondent (n=45; 44.6%) shares that shelter was missing clean drinking water, electricity and less space followed by medical aid (n=21; 20.8%), personal space and electricity (n=16; 15.8%), water and electricity (n=03; 3.0%), unable to use washroom (n=02; 2.0%), oil and soap (n=01; 1.0%), lack of mosquito net and light (n=01; 1.0%) and nothing missed so far (n=01; 1.0%). More than 10% (n=11; 10.9%) of respondents were not given any response.

*Table 76: Shelter has gender supported space*

| Gender supported space | No. of respondents | Percentage (%) |
|---|---|---|
| Yes | 60 | 40.0% |
| No | 68 | 45.3% |
| No response | 22 | 14.7% |
| **Total** | **150** | **100%** |

The above table (table 8.4) shows the gender supported space in the shelter. Most of the respondents (n=68; 45.3%) stated that there was no gender supported space in the shelter followed by 40.0% (n=60) who agreed that there was gender supported space. No response was given by total 22 respondents (14.7%).

*Table 77: Availability of medical services in the shelter*

| Medical services in the shelter | No. of respondents | Percentage (%) |
|---|---|---|
| Yes | 36 | 24.0% |
| No | 106 | 70.7% |
| No response | 08 | 5.3% |
| **Total** | **150** | **100%** |

The above table (table 8.5) shows the availability of medical services in the shelter. Majority of the respondent (n=106; 70.7%) stated that there were no medical services present in the shelter followed by 24.0% (n=36) who pointed out that there were medical services. No response was given by total eight respondents (5.3%).

*Table 78: Adequate of medical services*

| Adequate medical services | No. of respondents | Percentage (%) |
|---|---|---|
| Yes | 33 | 91.7% |
| No | 03 | 8.3% |
| **Total** | **36** | **100%** |

The above table (table 8.6) shows the status of adequate medical services. Majority of the respondents (n=33; 91.7%) stated that there were adequate medical services followed by no adequate medical services (n=03; 8.3%).

*Table 79: Access treatment for pregnant women:*

| Access treatment for pregnant women | No. of respondents | Percentage (%) |
|---|---|---|
| Yes | 22 | 61.1% |
| No | 14 | 38.9% |
| **Total** | **36** | **100%** |

The above table (table 8.7) shows the status of pregnant women had access the treatment. Majority of the respondents (n=22; 61.1%) stated that pregnant women had an access to receive treatment followed by no such access (n=14; 38.9%).

*Table 80: Access treatment for elderly people*

| Access treatment for elderly people | No. of respondents | Percentage (%) |
|---|---|---|
| Yes | 24 | 66.7% |
| No | 12 | 33.3% |
| **Total** | **36** | **100%** |

The above table (table 8.8) shows the status of elderly people had access the treatment. Majority of the respondents (n=24; 66.7%) stated that elderly people had an access to receive treatment followed by no such access (n=12; 33.3%).

*Table 81: Access treatment for children*

| Access treatment for children | No. of respondents | Percentage (%) |
|---|---|---|
| Yes | 29 | 80.6% |
| No | 07 | 19.4% |
| **Total** | **36** | **100%** |

The above table (table 8.9) shows the status of children had access the treatment. Majority of the respondents (n=29; 80.4%) stated that children had an access to receive treatment followed by no such access (n=07; 19.4%).

*Table 82: Qualified doctor's adequate services*

| Adequate doctor's services | No. of respondents | Percentage (%) |
|---|---|---|
| Yes | 34 | 94.4% |
| No | 02 | 5.6% |
| **Total** | **36** | **100%** |

The above table (table 8.10) shows the status of adequate qualified doctor's services. Majority of the respondents (n=34; 94.4%) stated that there were adequate qualified doctor's services followed by no adequate services (n=02; 5.6%).

*Table 83: Medicine and healthcare support*

| Medicine and healthcare support | No. of respondents | Percentage (%) |
|---|---|---|
| Yes | 35 | 97.2% |
| No | 01 | 2.8% |
| **Total** | **36** | **100%** |

The above table (table 8.11) shows the status of medicine and healthcare support. Majority of the respondents (n=35; 97.2%) stated that there were medicine and healthcare support followed by no such support (n=01; 2.8%).

*Table 84: Type of available medical services*

| Available medical services | No. of respondents | Percentage (%) |
|---|---|---|
| First aid | 82 | 54.7% |
| Hospital facilities | 29 | 19.3% |
| No response | 39 | 26.0% |
| **Total** | **150** | **100%** |

The above table (table 8.12) shows the available medical services. Majority of the respondents (n=82; 54.7%) expressed the available medical services of first aid followed by no any response (n=39; 26.0%) and hospital facilities (n=29; 19.3%).

*Table 85: Getting relief in this flood*

| Getting relief | No. of respondents | Percentage (%) |
|---|---|---|
| Yes | 109 | 72.7% |
| No | 41 | 27.3% |
| **Total** | **150** | **100%** |

The above table (table 8.13) shows that majority of respondents (n=109; 72.7%) had received relief followed by not received (n=41; 27.3%).

*Table 86: Distribution of gender and getting relief in this flood*

| Getting relief in this flood (Count % in column) | Gender | | Total (%) |
|---|---|---|---|
| | Male (%) | Female (%) | |
| Yes | 68 (72.3%) | 41 (73.2%) | 109 (72.7%) |
| No | 26 (27.7%) | 15 (26.8%) | 41 (27.3%) |
| **Grand Total** | **94 (100%)** | **56 (100%)** | **150 (100%)** |

The above table (table 8.14) shows that among males, majority of them (n=68; 72.3%) had received relief and 27.7% (n=26) were not received. Among females, majority of them (n=41; 73.2%) had received relief and 26.8% (n=15) were not received.

*Table 87: Chi square table for gender and getting relief in this flood*

| Variable | $X^2$ | *df* | *p Value* |
|---|---|---|---|
| Gender and getting relief in this flood | 0.013 | 01 | 0.908 |

Note- Significant p Value = 0.05

The above chi square table (table 7.3) stated that gender and getting relief in this flood ($X^2$= 0.013, *df* = 1, p = 0.908) was statistically insignificant.

*Table 88: Distribution of number of times to get relief*

| Number of times to get relief | No. of respondents | Percentage (%) |
|---|---|---|
| 1 time only | 42 | 38.5% |

| | | |
|---|---|---|
| 2 times | 27 | 24.8% |
| 3 times | 26 | 23.9% |
| 4 times | 04 | 3.7% |
| 5 times | 03 | 2.8% |
| More than 5 times | 07 | 6.4% |
| **Total** | **109** | **100%** |

The above table (table 8.16) stated that most of the respondents (n=42; 38.5%) received relief only of one time followed by two times (n=27; 24.8%), three times (n=23.9%), more than five times (n=07; 6.4%), four times (n=04; 3.7%) and five times (n=2.8%).

*Table 89: Distribution of sources to get relief items*

| **Sources to get relief** | **No. of respondents** | **Percentage (%)** |
|---|---|---|
| NGO/INGO | 22 | 20.2% |
| Government | 59 | 54.1% |
| NGO, Govt & Club | 05 | 4.6% |
| Club & Govt | 02 | 1.8% |
| NGO & Govt | 17 | 15.6% |
| Relatives & NGO | 01 | 0.9% |
| Club & NGO | 01 | 0.9% |
| Neighbours & Govt. | 02 | 1.8% |
| **Total** | **109** | **100%** |

The above table (table 8.17) stated that majority of the respondents (n=59; 54.1%) received relief items from the government source followed by NGO/INGO (n=22; 20.2%), NGO & Govt. (n=17; 15.6%), NGO, Govt. & club (n=05; 4.6%), club & Govt (n=02; 1.8%), neighbor & Govt. (n=02; 1.8%), relatives & NGO (n=01; (n=01; 0.9%) and club & NGO (n=02; 0.9%).

*Table 90: Distribution of kinds of relief items*

| **Kinds of Relief items** | **No. of respondents** | **Percentage (%)** |
|---|---|---|
| Groceries | 11 | 10.1% |
| Cash | 05 | 4.6% |
| Water | 03 | 2.8% |
| Groceries, Medicine & Water | 24 | 22.0% |
| Groceries, medicine, water & child food | 06 | 5.5% |
| Groceries, dry food, medicine and water | 07 | 6.4% |
| Groceries & water | 26 | 23.9% |

| | | |
|---|---|---|
| Groceries, water & child-food | 03 | 2.8% |
| Groceries & medicine | 02 | 1.8% |
| Groceries, dry food, water & water purifying tablet | 01 | 0.9% |
| Groceries, dry food & water | 16 | 14.7% |
| No response | 05 | 4.6% |
| **Total** | **109** | **100%** |

The above table (table 8.18) depicts that, most of the respondents (n=26; 23.9%) received relief of groceries and water followed by groceries, medicine & water (n=24; 22.0%), groceries, dry food & water (n=16; 14.7%), groceries (n=11; 10.1%) and also other relief items.

*Table 91: Relief items were enough for respondent's family*

| Relief items were enough | No. of respondents | Percentage (%) |
|---|---|---|
| Sufficient | 08 | 7.3% |
| Somewhat sufficient | 28 | 25.7% |
| Insufficient | 63 | 57.8% |
| No response | 20 | 18.3% |
| **Total** | **109** | **100%** |

The above table (table 8.19) shows that relief items were enough or not for the household. Majority of the respondents (n=63; 57.8%) stated that relief items were insufficient followed by somewhat sufficient (n=28; 25.7%) and sufficient (n=08; 7.3%). No response was given by 20 respondents (18.3%).

*Table 92: Items to be included in relief*

| Items to be included | No. of respondents | Percentage (%) |
|---|---|---|
| Sanitary napkins | 04 | 3.7% |
| Sanitary napkin and cash | 02 | 1.8% |
| Cash & child food | 01 | 0.9% |
| Materials for reconstruction house | 01 | 0.9% |
| Soap, oil, sugar & wheat | 02 | 1.8% |
| Candle & kerosine | 01 | 0.9% |
| Medicine, water & child-food | 02 | 1.8% |
| More items for longer period | 02 | 1.8% |
| Basic food items | 45 | 41.3% |

| | | |
|---|---|---|
| Child-food & candle | 01 | 0.9% |
| Only cash | 04 | 3.7% |
| Medicine, sanitary pads & baby-food | 01 | 0.9% |
| Medicines | 03 | 2.8% |
| Child-food | 01 | 0.9% |
| No response | 39 | 35.8% |
| **Total** | **109** | **100%** |

The above table (table 8.20) shows various items need to be included as per respondents. Here, most of the respondents (n=45; 41.3%) were looking for basic food items to be included in relief followed by other items. Basic food item includes – rice, eggs, bread, etc.

For reconstruction and rehabilitation, 20 respondents (18.3%) stated that they had received financial assistance. Three respondents received Rs. 3000/-, two respondents received Rs. 3200/-, two respondents received Rs. 3800/-, one respondent received Rs. 4000/-, six respondents received Rs. 5000/-, five respondents received Rs. 5200/- and one respondent stated to received financial support but could not mention the amount.

Majority of the respondents (n=83; 76.1%) stated the damages and loses that happened at individual household level was infrastructure (road, tube-well, house, disruption of electricity supply) followed by other types of loses.

*Table 93: Challenges confronted once return home after flood*

| **Challenges confronted** | **No. of respondents** | **Percentage (%)** |
|---|---|---|
| House was partially slashed | 12 | 11.0% |
| Crops were damaged & drinking water issues | 02 | 1.8% |
| Damage of household materials | 32 | 29.4% |
| Nothing so far | 01 | 0.9% |
| Damage of both house & household properties | 39 | 35.8% |
| Damage of household materials & vehicle | 03 | 2.8% |
| Damage of vehicle | 01 | 0.9% |
| House was completely destroyed | 13 | 11.9% |
| No response | 06 | 5.5% |

| | | |
|---|---|---|
| **Total** | **109** | **100%** |

The above table (table 8.21) shows the challenges confronted by the household once returned after flood. Most of the respondents (n=39; 35.8%) stated damage of both house and household properties followed by damage of household materials (n=32; 29.4%), house was completely destroyed (n=13; 11.9%), house was partially slashed (n=12; 11.0%), damage of household materials and vehicle (n=03; 2.8%), crops were damaged and drinking water issues (n=02; 1.8%), damage of vehicle (n=01; 0.9%) and nothing so far (n=01; 0.9%). Six respondents (5.5%) were not given any response.

*Table 94: Comparison for section H*

| Aspect | Case A (North-East Bangladesh) | Case B (Barak Valley, Assam, India) | Comments |
|---|---|---|---|
| Shelter Facilities | 80% sufficient | 57.3% sufficient | More respondents in Case A found shelter facilities sufficient. |
| Willingness to Relocate to Shelters | 88% willingly relocated | 67.3% willingly relocated | Higher willingness observed in Case A. |
| Gender-Supported Space in Shelters | 87% observed no gender-supportive spaces | 40% reported gender-supported space | Higher availability of gender-supported space in Case B. |
| Toilet Facilities in Shelters | Nearly all felt toilets were enough | Not specified | Only Case A data available. |
| Medical Services in Shelters | 95% found no medical services | 70.7% found no medical services | Lack of medical services in both, more acute in Case A. |
| Quality of Medical Services | 60% said services never adequate | 91.7% found medical services adequate | Better perception of medical service quality in Case B. |

| | | | |
|---|---|---|---|
| Qualified Doctors' Services | 80% found doctors' services adequate | Not specified | Only Case A data available. |
| Medicine and Healthcare Support | 70% received required support | 97.2% received support | Higher satisfaction in Case B. |
| Availability of Different Medical Services | 50% had first aid, 10% hospital facilities | 54.7% had first aid, 19.3% hospital facilities | Slightly better availability in Case B. |
| Relief Distribution | 59% received relief | 72.7% received relief | Higher relief distribution in Case B. |
| Frequency of Relief Receipt | Majority received once | Varies (38.5% once, up to 6.4% more than five times) | More varied frequency in Case B. |
| Relief Providers | 34% from NGOs/INGOs, 22% government | Varied sources, 54.1% government | Greater government involvement in Case B. |
| Types of Relief Items | Mostly dry foods, groceries, water | Varied, including groceries, medicine, child food | More diversity in relief items in Case B. |
| Sufficiency of Relief | 66% found relief supply inadequate | 57.8% found relief insufficient | Slightly better perception in Case B. |
| Support for Reconstruction/Rehabilitation | 94% did not receive support | Financial support detailed | Specific support details available only for Case B. |

| | | | |
|---|---|---|---|
| Challenges Post-Flood | Damaged homes, erosion, etc. | Varied, including house damage, vehicle damage | Similar challenges in both cases. |

# Summary of the study

*Table 95: Summary of the study*

| Category | Aspect | Study 1: Shantigonj Upazila, Bangladesh | Study 2: Cachar District, Assam | Comments |
|---|---|---|---|---|
| Study Overview | Study Design | Narrative action research | Descriptive with mixed methods | Study 1 is narrative; Study 2 uses both quantitative and qualitative methods |
| | Geographical Location | Three villages in Shantigonj Upazila | 15 communities in Cachar district | Study 2 covers a broader area |
| | Sampling Size | 300 individuals | 150 families for quantitative, 16 for qualitative | Study 1 has a larger sample; Study 2 separates quantitative and qualitative samples |
| | Data Collection and Analysis | Semi-structured interviews with questionnaire | Primary and secondary data with SPSS-20 analysis | Study 2 includes secondary data and uses statistical software |
| | Ethical Issues | Informed consent emphasized | Not specified | Study 1 explicitly addresses ethical considerations |

| | | | | |
|---|---|---|---|---|
| Demographics | Gender Distribution | 52% male, 48% female | 62.7% male, 37.3% female | Case B has a higher proportion of male participants |
| | Household Size | Majority 4-6 members | Majority up to 5 members | Larger households in Case A |
| | Monthly Household Income | 70% earn below 15,000 BDT | More varied income distribution | Broader income distribution in Case B |
| | Housing Structure | 70% in kutcha houses | Majority in concrete houses | More developed housing in Case B |
| Flood Awareness and Response | Basic Knowledge of Floods | 49.6% have basic understanding | 49.6% have basic understanding | Identical levels of basic understanding in both cases |
| | Perception of Flash Flood Causes | 34% attribute to divine will, 33% to upstream water, 30% to rainfall | Same distribution of beliefs | Similar perceptions in both regions |
| | Warning Message Reception | 87% did not receive warnings | 76% did not receive warnings | Majority in both cases did not receive early warnings |
| Livelihood and Support | Impact on Primary Livelihood | 90% significantly affected | 94.7% primary livelihood affected | Slightly higher impact in Case B |
| | Alternative Livelihood Arrangements | 94% reported none | 85.3% reported no alternatives | Lack of alternatives in both, more acute in Case A |

| | | | | |
|---|---|---|---|---|
| | Relief Distribution | 59% received relief | 72.7% received relief | Higher relief distribution in Case B |
| Shelter and Safety | Types of Shelter Used | Mostly academic institutions | Various, including academic institutes, relatives' houses | More variety in Case B |
| | Safety for Women in Shelters | 70% indicated shelters were safe | 86% felt shelters were safe for women | Higher safety perception in Case B |
| Health and Wellness | Family Members Suffering from Health Problems | 70% reported health issues | 63.3% reported health issues | Slightly more reported in Case A |
| | Quality of Medical Treatment | 43% rated treatment as average; 35% as poor | Majority found government facilities helpful | More positive responses in Case B |
| Education Impact | Educational Attainment in Households | 70% had members in education | 63.3% had members in education | Slightly more households in Case A reported having members attending educational institutions |
| Post-Flood Challenges | Challenges Post-Flood | Damaged homes, erosion, etc. | Varied, including house damage, | Similar challenges in both cases |

| | | | | |
|---|---|---|---|---|
| | | | vehicle damage | |

## Chapter 7: Recommendations (Case A)

## 7.1 Recommendations

The following considerations are recommended from this study as immediate and long-term approaches concerning the gender and intersectional lens:

### 7.1.1 Regarding the access to shelter, safety, security and protection aspects of flash flood-affected communities

a. Immediate concerns to be addressed:
   - ❖ Provide emergency assistance for the repair of damaged homes, as well as in-kind and monetary aid for permanently displaced people.
   - ❖ Advocate with the Union WATSAN Committee, UDMC, and DDMC to establish and/or expand safe spaces, secure bathing spaces for affected women and adolescent girls, and a breastfeeding corner in the evacuation shelters (local actors must do the advocating) and to provide the community with gender-based violence case management, referral, and psychosocial support.
   - ❖ Provide orientation on gender issues to rescue volunteers and security personnel who manage shelters.
   - ❖ Volunteer women should manage the women's breastfeeding area.

b. Long-term concerns to be addressed:
   - ❖ Develop a frontline workforce that is well-equipped and sensitive to gender, protection, and inclusion (including PIO/DDRO, field officials, CPP/FPP, and other community volunteers, including adolescents and youth).
   - ❖ Advocacy with the Ministry of Disaster Management and Relief to include safe and secure bathing areas and a breastfeeding corner for women and girls in all flood shelters.
   - ❖ Ensure effective participation of disaster management committees so that they can discuss the situation and needs of women, girls, children, the elderly, individuals with disabilities, and gender-diverse groups at their periodic meetings in order to monitor and plan new initiatives.

### 7.1.2 Regarding the access to food security and income stability of flash flood-affected intersectional vulnerable groups:

a. Immediate concerns to be addressed:

- ❖ To meet food security and nutrition needs, provide essential food packages and a multipurpose cash grant, focusing on pregnant and breastfeeding mothers, children, widows, the disabled, the elderly, and women-headed households.
- ❖ Provide cash-for-work programmes in order to employ more women and gender-diverse labourers.

b. Long-term concerns to be addressed:
   - ❖ Provide women and women-headed households with cash grants and interest-free or low-interest loans for reestablishing their livelihoods.
   - ❖ Provide interest-free loans to female entrepreneurs of small and microbusinesses.
   - ❖ Provide support for a market distribution system, supply chain, and value chain system that is inclusive of women.

### 7.1.3 Regarding the water, sanitation and hygiene-related issues of flash flood-affected communities:

a. Immediate concerns that needs to be addressed:
   - ❖ Advocate for restoring water points, tube wells, rainwater collection systems, and water treatment facilities.
   - ❖ Repair/rebuild damaged latrines/build new temporary latrines for the most vulnerable populations, including the disabled and the elderly.
   - ❖ Include well-maintained and separate WASH facilities in flood shelters for women, girls, and children, as well as safety and security measures.
   - ❖ Provide shelters with menstrual hygiene management kits and disposal mechanisms for sanitary napkins and pads, and develop behavior change messages.

b. Long-term concerns to be addressed:
   - ❖ Using microphones, conduct hygiene education sessions while maintaining social distance.
   - ❖ Build the capacity of women, girls, and gender-diverse groups to maintain their leadership role in the development of a gender-sensitive water safety plan.

### 7.1.4 Regarding health and reproductive health:

a. Immediate concerns that need to be addressed:
   - ❖ Ensure that pregnant women receive antenatal and postnatal care, identification of complications, and prompt referral, including transportation and/or financial assistance for transportation.
   - ❖ Ensure safe delivery for pregnant women.

- ❖ If women are unable to come to the facility, essential supplies for a safe delivery must be provided.
- ❖ Distribute menstrual hygiene management and reproductive health kits to women, adolescent girls, and persons with disabilities in order to meet menstruation needs and increase awareness of sexual and reproductive health concerns.
- ❖ Ensure that medical teams include a female physician.

b. Long-term concerns to be addressed:

- ❖ Health care facilities must have sufficient personnel and midwives to provide services 24 hours a day, seven days a week, as well as the necessary medical supplies and equipment to treat and care for patients with sexual and reproductive health and emergency obstetric conditions.

*Table 96: Recommendations*

| Recommendation Category | Case A (North-East Bangladesh) | Case B (Barak Valley, Assam, India) |
|---|---|---|
| Access to Shelter, Safety, and Security | - Establish safe spaces and secure bathing for women and girls<br>- Provide gender-based violence support | - Contact NDRF for assistance<br>- Shifting to safest places |
| Food Security and Income | - Provide food packages and cash grants, especially to vulnerable groups<br>- Cash-for-work programs to employ women and diverse labor | - Essential goods storage for emergencies<br>- Keep necessary medicines |
| Water, Sanitation, and Hygiene (WASH) Issues | - Restore water points and latrines<br>- Ensure separate WASH facilities in shelters<br>- Provide menstrual hygiene kits | - Proper sanitation facilities for women<br>- Making loft, building house in hilly areas |
| Health and Reproductive Health Services | - Ensure antenatal care and safe delivery<br>- Distribute menstrual hygiene and reproductive health kits | - Protect elderly and children from dirty water<br>- Provide medicine and nutrition |

| | | |
|---|---|---|
| Reconstruction and Rehabilitation Support | - Provide financial/material support for rebuilding<br>- Monetary support for reconstruction | - Building houses in safe areas<br>- Repair bridges, improve drainage systems |
| Specific Recommendations for Women | - Gender issues orientation for volunteers<br>- Manage women's breastfeeding area | - Emotional support to cope up<br>- Proper house construction against floods |
| Specific Recommendations for Men | - Advocacy for inclusive flood shelters | - Fulfil important daily needs<br>- Make proper drainage system |
| Specific Recommendations for Persons with Disabilities | - Ensure accessibility and safety in shelters and rehabilitation facilities | - Send to safe places, contact NDRF for assistance |
| Specific Recommendations for Elderly and Children | - Discuss the needs of vulnerable groups in disaster management committees | - Emotional support to cope up<br>- Send away from flood-affected places |
| Specific Recommendations for Transgender Individuals | - Include the needs of gender-diverse groups in planning and monitoring | - Not specified |

## Section I: Recommendations (Case B)

*Table 97: Respondent's recommendation given for women*

| **Responses** | **No. of person** | **Percentage (%)** |
|---|---|---|

| | | |
|---|---|---|
| Need to store essential things for emergency | 01 | 0.7% |
| Keep necessary medicines for emergency | 02 | 1.3% |
| Need to follow warning messages | 01 | 0.7% |
| Need extra care for vulnerable population | 02 | 1.3% |
| Building house in hilly area | 02 | 1.3% |
| Contact NDRF for assistance | 27 | 18.0% |
| No idea | 10 | 6.7% |
| Proper sanitation facility for women | 03 | 2.0% |
| Making loft | 01 | 0.7% |
| Shifting to safest place | 12 | 8.0% |
| Self-awareness is necessary | 01 | 0.7% |
| No response | 88 | 58.7% |
| **Total** | **150** | **100%** |

The above table (table 9.1) shows that majority of respondents (n=88; 58.7%) did not response on recommendation for women followed by 18.0% (n=27) suggested to contact NDRF for assistance, 8.0% (n=12) suggested shifting women to safest places and apart from that there were several other responses which are highlighted in the above cited table.

*Table 98: Respondent's recommendation given for men*

| **Responses** | **No. of person** | **Percentage (%)** |
|---|---|---|
| They should take the family to safe shelter | 27 | 18.0% |
| Make proper house to defeat flood situation | 06 | 4.0% |
| Repairment of the bridges | 01 | 0.7% |
| Building house in hilly area | 06 | 4.0% |
| Fulfil important daily needs | 01 | 0.7% |
| To make proper drainage system | 08 | 5.3% |
| No response | 101 | 67.3% |
| **Total** | **150** | **100%** |

The above table (table 9.2) shows that majority of respondents (n=101; 67.3%) did not response on recommendation for men followed by 18.0% (n=27) suggested to take family members in safe shelter, 5.3% (n=08) suggested to make proper drainage system and apart from that there were several other responses which are highlighted in the above cited table.

*Table 99: Respondent's recommendation given for persons with disability*

| Responses | No. of person | Percentage (%) |
|---|---|---|
| They should be sent to safe places | 01 | 0.7% |
| Contact NDRF for assistance | 01 | 0.7% |
| No idea | 24 | 16.0% |
| No response | 124 | 82.7% |
| **Total** | **150** | **100%** |

The above table (table 9.3) shows that majority (n=124; 82.7%) could not give any response followed by 16.0% (n=24) who had no idea, contact to NDRF for assistance (n=01; 0.7%) and should be sent to safe places (n=01; 0.7%).

*Table 100: Respondent's recommendation given for persons with disability*

| Responses | No. of person | Percentage (%) |
|---|---|---|
| Protect them from dirty water and provide medicine and nutrition | 01 | 0.7% |
| Need to send them in relatives house | 09 | 6.0% |
| No idea | 19 | 12.7% |
| Emotional support to cope-up | 01 | 0.7% |
| Send them away from affected place | 02 | 1.3% |
| Contact NDRF for assistance | 02 | 1.3% |
| No response | 116 | 77.3% |
| **Total** | **150** | **100%** |

The above table (table 9.4) shows that majority of respondents (n=116; 77.3%) did not response on recommendation for elderly people and child followed by 12.7.0% (n=19) who had no idea, 6.0% (n=09) suggested to send them in relative's house and apart from that there were several other responses which are highlighted in the above cited table.

*Table 101: Respondent's recommendation given for persons with disability*

| Responses | No. of person | Percentage (%) |
|---|---|---|
| No idea | 49 | 32.7% |
| No response | 101 | 67.3% |
| **Total** | **150** | **100%** |

The above table (table 9.5) shows that majority of respondents (n=101; 67.3%) did not response on recommendation for transgender and 32.7% (n=49) had no such idea.

The research showed that the community in the Haor basins of Sunamganj and Assam are particularly vulnerable to the effects of flash floods, and that more should be done to prepare for them and lessen their severity. The primary focus should be on incorporating a gender and intersectional lens to strengthen community resilience to flooding. In addition to having a devastating effect on the most vulnerable communities, the floods have also damaged the economy, infrastructure, and agricultural output. Organizations and platforms that have been providing essential relief services during the floods and have promised to continue doing so after the waters have subsided should be involved in the recommended efforts to ensure a coordinated response.

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# Annexure

## Annex 1: Questionnaire

**Flash Flood in North-East Bangladesh: Gender and Intersectional Analysis**

| | |
|---|---|
| **Interviewee:**<br>**Signature:** | **ID:**<br>**Date:** |

| | | | | | |
|---|---|---|---|---|---|
| **Section A: Demographic Information** | | | | | |
| 101 | **Name** | | | | |
| 102 | **Mobile Number (Optional)** | | | | |
| 103 | **Address** | Village: | Ward: | Union: | |
| 104 | **Sex** | ☐ Male | ☐ Female | ☐ Others | |
| 105 | **Age (In Actual Year)** | | | | |
| 106 | **Educational Qualification** | ☐ No Formal Education | ☐ Literate (can only signature) | ☐ Primary | ☐ Secondary |
| | | ☐ SSC | ☐ HSC | ☐ Graduation | ☐ Others…. (Specify) |
| 107 | **Occupation** | ☐ Homemaker | ☐ Farmer | ☐ Boating | ☐ Livestock Rearing |
| | | ☐ Fishing | ☐ Day Laborer | ☐ Business | ☐ Government Employee |
| | | ☐ Private Employee | ☐ Student | ☐ Unemployed | ☐ Others……. (Specify) |
| 108 | **Marital Status** | ☐ Unmarried | ☐ Married | | ☐ Separated |
| | | ☐ Widowed | ☐ Husband Abandoned | | ☐ Divorced |
| 109 | **Household Members** (Number of men/women/children/adolescent boys and girls) | | | | |
| 110 | **Number of Earning Household Members** | | | | |
| 111 | **Monthly Household Expenses (Approximately)** | | | | |
| 112 | **Monthly Household Income (Approximately)** | | | | |
| 113 | **Housing Structure** | ☐ Kacha | ☐ Semi-Paka | ☐ Concrete | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 114 | **Other Assets** | ☐ Livestock | ☐ Boat | ☐ Pond | ☐ Land | ☐ Others…. (Specify) |

| **Section B: Perception of Flash Flood** | | | |
|---|---|---|---|
| 201 | Basic knowledge regarding flood and flash flood? | | |
| 202 | Differences between flood and flash flood? (According to you) | | |
| 203 | What, according to you, are the causes of flash flood? | | |
| 204 | Is there any difference between previous and present flood situation? **(If 'No', go to 301)** | ☐ Yes | ☐ No |
| 205 | What are the differences between the flash flood you have experienced earlier and this year's (2022)? | | |

| **Section C: Early Warning and Preparedness of Flash Flood** | | | | | | |
|---|---|---|---|---|---|---|
| 301 | How many days flood water have stayed this year in your village? | | | | | |
| 302 | Were you affected by this year's flood? | ☐ Yes | ☐ No | | | |
| 303 | Did you get any warning message for this flood? **(If 'No', go to 306)** | ☐ Yes | ☐ No | | | |
| 304 | What were the sources of the warning message? | | | | | |
| | ☐ Television | ☐ Social media | ☐ Radio | ☐ Miking | ☐ Newspaper | |
| | ☐ Local Govt. or NGO | ☐ Volunteers | ☐ Neighbor or Friends | ☐ Others | ☐ Don't know | |
| 305 | How effective the warning messages are, according to you? | | | | | |
| | ☐ Not effective at all | ☐ Slightly effective | ☐ Effective | ☐ Very effective | | |
| 306 | Did you have any preparation for the flood? **(If 'No', go to 401)** | ☐ Yes | ☐ No | | | |
| 307 | How much time did you get to prepare yourselves? | | | | | |
| | ☐ More than one week | ☐ At least one week | ☐ 1-2 days | ☐ No preparedness at all | ☐ Don't know | |
| 308 | What kind of preparations did you have? | | | | | |

| | | | | |
|---|---|---|---|---|
| | I) | Savings | ☐ Yes | ☐ No |
| | II) | Storing fuel | ☐ Yes | ☐ No |
| | III) | Making loft | ☐ Yes | ☐ No |
| | IV) | Storing dry food | ☐ Yes | ☐ No |
| | V) | Building house on higher platform | ☐ Yes | ☐ No |
| | VI) | Storing seeds | ☐ Yes | ☐ No |
| | VII) | Storing Fodder | ☐ Yes | ☐ No |
| | VIII) | Others | ☐ Yes | ☐ No |

| **Section D: Impact on Income and Livelihood** | | | | | |
|---|---|---|---|---|---|
| 401 | How did the flood impact your occupation? | | | | |
| 402 | Was your primary livelihood affected by the flood? | | ☐ Yes | ☐ No | |
| 403 | Was there any alternative livelihood arrangement? | | ☐ Yes | ☐ No | |
| 404 | Have you received any aid for livelihood management? **(If 'No', go to 407)** | | ☐ Yes | ☐ No | |
| 405 | How effective the aid was? | | | | |
| | ☐ Not effective at all | ☐ Slightly effective | ☐ Effective | ☐ Very effective | |
| 406 | From which sources had you received the aid? | | | | |
| | ☐ Government | ☐ NGO/INGO | ☐ Private Sector | ☐ Others……(Specify) | |
| 407 | Did your income decrease due to flash flood? **(If 'No', go to 501)** | | ☐ Yes | ☐ No | |
| 408 | How did you survive with the low income? | | | | |

| **Section E: Impact on Gender and Intersectionality** | | | | | |
|---|---|---|---|---|---|
| 501 | Had the female members of your household gone to shelter during flood? **(If 'No', go to 504)** | | | ☐ Yes | ☐ No |
| 502 | How were the shelter facilities for women? | Washroom | | Space | |
| | | ☐ Separate | ☐ Combined | ☐ Sufficient | ☐ Insufficient |
| 503 | Was the shelter safe for women and adolescent girls? | | | ☐ Yes | ☐ No |
| 504 | Was there any form of harassment that the female or adolescent member of your household had experienced during flood? | | | ☐ Yes | ☐ No |

| | | | | |
|---|---|---|---|---|
| 505 | What were the challenges for the adolescent girl of your household? **(If any)** | | | |
| 506 | How did the females of the household manage their menstrual needs during flood? | ☐ Using sanitary pads | ☐ Using cloths | ☐ Using nothing and staying at home |
| 507 | Who was the decision-maker of your household during flood? | ☐ Male Head | ☐ Female Head | ☐ Others |
| 508 | Was there any pregnant women or lactating mother in your household? **(If 'No', go to 510)** | | ☐ Yes | ☐ No |
| 509 | How did this flood affect them? | | | |
| 510 | Do you have any transgender living in your household? **(If 'No', go to 512)** | | ☐ Yes | ☐ No |
| 511 | How did this flood affect them? | | | |
| 512 | Is there any person with disability in your household? **(If 'No', go to 514)** | | ☐ Yes | ☐ No |
| 513 | How did this flood affect them? | | | |
| 514 | Are there any elderly people in your household? **(If 'No', go to 601)** | ☐ Yes | ☐ No | |
| 515 | How did this flood affect them? | | | |
| 516 | Where did you move the person with disability of your household during flood? | ☐ To shelter | ☐ To safe place nearby | ☐ Leave at home |
| 517 | What was the general scenario for intersectional community inside the shelter premises? | | | |
| 518 | Have you seen any changes over time in terms of awareness, acceptability & accessibility? Briefly explain. | | | |

| **Section F: Impact on Education** | | | |
|---|---|---|---|
| 601 | Do you have any school/college/university-going member in your household? **(If 'No', go to 701)** | ☐ Yes | ☐ No |
| 602 | Did the study of the member hamper due to the flood? **(If 'No', go to 701)** | ☐ Yes | ☐ No |

| | | | | |
|---|---|---|---|---|
| 603 | How did the flood hamper his/her study? | | | |
| 604 | How difficult for the students to cope-up with the situation? | | | |
| | ☐ Not difficult at all | ☐ Slightly difficult | ☐ Difficult | ☐ Very difficult |

| | | | | |
|---|---|---|---|---|
| **Section G: Impact on Health** | | | | |
| 701 | Did anyone in your family suffered from health problems during flood? **(If 'No', go to question no. 801)** | | ☐ Yes | ☐ No |
| 702 | What kind of health problems did they face? | | | |
| | ☐ Fever | ☐ Diarrhea | ☐ Cold/ Cough | ☐ Dysentery |
| | ☐ Skin Disease | ☐ Cholera | ☐ Typhoid | ☐ Jaundice |
| | ☐ Puberty | ☐ Pregnancy complication | ☐ Old-age complication | ☐ Psychological Complication |
| | ☐ Snake bite | ☐ Chronic disease | ☐ Others | |
| 703 | Was it possible to provide them treatment? **(If 'No', go to 801)** | | ☐ Yes | ☐ No |
| 704 | How was the treatment? | | | |

| | | | |
|---|---|---|---|
| **Section H: Flash Flood Response** | | | |
| 801 | Do you think there were enough shelter facilities for everyone? | ☐ Yes | ☐ No |
| 802 | Did people have the willing to go to shelter? **(If 'Yes', go to 808)** | ☐ Yes | ☐ No |
| 803 | If no, then why? Reasons… | | |
| 804 | Which facilities were missing inside the shelter? Please briefly share your experience. | | |
| 805 | Did the shelter have gender segregated space? | ☐ Yes | ☐ No |
| 806 | Were there any medical services available in the shelter? | ☐ Yes | ☐ No |
| 807 | What type of medical services were available? | | |

| | | | | | |
|---|---|---|---|---|---|
| | ☐ First aid | ☐ Mental health counselling | ☐ Hospital facilities | ☐ Homeopathy | ☐ Others….. (Specify) |

| | | | | |
|---|---|---|---|---|
| 808 | Did you get any kind of relief in this flood? **(If 'No' then go to question no. 901)** | | ☐ Yes | ☐ No |
| 809 | How many times did you get relief? | | | |
| 810 | From whom did you get the relief items? **(Mention serially)** | | | |
| | ☐ Relatives..... | ☐ Neighbors..... | ☐ Club/foundation..... | |
| | ☐ NGO/INGO..... | ☐ Government..... | ☐ Others..... | |
| 811 | What kind of relief items did you get during flood? | | | |
| | ☐ Groceries | ☐ Dry food | ☐ Medicine | ☐ Fruits |
| | ☐ Cash | ☐ Clothes | ☐ hotchpotch | ☐ Water |
| | ☐ Water purifying tablet | ☐ Child-food | ☐ Sanitary napkin | ☐ Others |
| 812 | Do you think the relief items were enough for your family? | | | |
| | ☐ Sufficient | ☐ Somewhat sufficient | ☐ Insufficient | |
| 813 | What can be included in the relief item, according to you? | | | |

| **Section F: Recommendations** | | |
|---|---|---|
| 901 | Women (Including adolescence, pregnant women, lactating women) | |
| 902 | Men | |
| 903 | Persons with disabilities | |
| 904 | Elderly people and child | |
| 905 | Transgender | |
| 906 | Others | |

## Annex 2: Data Analysis Tables

| Gender | Frequency | Percent |
|---|---|---|
| **Male** | 156 | 52 |
| **Female** | 144 | 48 |
| **Total** | **300** | **100** |

*Table 1: Gender of the respondents*

| Age Range | Frequency | Percent |
|---|---|---|
| **13-17** | 4 | 1.53 |
| **18-22** | 16 | 6.13 |
| **23-27** | 30 | 11.49 |
| **28-32** | 46 | 17.62 |
| **33-37** | 32 | 12.26 |
| **38-42** | 21 | 8.05 |
| **43-47** | 28 | 10.73 |
| **48-52** | 24 | 9.2 |
| **53-57** | 15 | 5.75 |
| **58-62** | 14 | 5.36 |
| **63-67** | 15 | 5.75 |
| **67-72** | 7 | 2.68 |
| **73-77** | 2 | 0.77 |
| **78+** | 7 | 2.68 |
| **Total** | **300** | |

*Table 2: Age of the Respondents*

| Educational Qualifications | Frequency | Percent |
|---|---|---|
| **No Formal Education** | 140 | 48.78 |
| **Literate (can only signature)** | 53 | 18.47 |
| **Primary** | 64 | 22.3 |
| **Secondary** | 15 | 5.23 |
| **SSC** | 9 | 3.14 |
| **HSC** | 3 | 1.05 |
| **Graduation** | 3 | 1.05 |
| **Missing** | **12** | |
| **Total** | **300** | |

*Table 3: educational qualifications of the respondents*

| Occupation of the respondents | Frequency | Percent |
|---|---|---|
| **Homemaker** | 102 | 35.92 |

| | | |
|---|---|---|
| **Farmer** | 39 | 13.73 |
| **Boating** | 7 | 2.46 |
| **Livestock Rearing** | 1 | 0.35 |
| **Fishing** | 46 | 16.2 |
| **Day Laborer** | 21 | 7.39 |
| **Business** | 22 | 7.75 |
| **Government Employee** | 2 | 0.7 |
| **Private Employee** | 2 | 0.7 |
| **Student** | 4 | 1.41 |
| **Unemployed** | 27 | 9.51 |
| **Others** | 11 | 3.87 |
| **Missing** | **15** | |
| **Total** | **300** | |

*Table 4: occupations of the respondents*

| Marital Status | Frequency | Percent |
|---|---|---|
| **Unmarried** | 18 | 6.29 |
| **Married** | 250 | 87.41 |
| **Separated** | 1 | 0.35 |
| **Widowed** | 16 | 5.59 |
| **Husband Abandoned** | 1 | 0.35 |
| **Missing** | **13** | |
| **Total** | **300** | |

*Table 5: marital status of the respondents*

| Household Size of the Respondents | Frequency | Percent |
|---|---|---|
| **1** | 3 | 1.03 |
| **2** | 8 | 2.76 |
| **3** | 19 | 6.55 |
| **4** | 46 | 15.86 |
| **5** | 60 | 20.69 |
| **6** | 53 | 18.28 |
| **7** | 27 | 9.31 |
| **8** | 27 | 9.31 |
| **9** | 10 | 3.45 |
| **10** | 10 | 3.45 |
| **11** | 8 | 2.76 |
| **12** | 5 | 1.72 |
| **13** | 5 | 1.72 |
| **14** | 1 | 0.34 |
| **15** | 3 | 1.03 |

| | | |
|---|---|---|
| **16** | 2 | 0.69 |
| **18** | 1 | 0.34 |
| **19** | 1 | 0.34 |
| **24** | 1 | 0.34 |
| **Missing** | **9** | |
| **Total** | **300** | |

*Table 6: Distribution of household size of the respondents*

| Earning Member in the household | Frequency | Percent |
|---|---|---|
| **0** | 4 | 1.41 |
| **1** | 175 | 61.62 |
| **2** | 73 | 25.7 |
| **3** | 22 | 7.75 |
| **4** | 3 | 1.06 |
| **5** | 1 | 0.35 |
| **6** | 3 | 1.06 |
| **7** | 1 | 0.35 |
| **9** | 1 | 0.35 |
| **11** | 1 | 0.35 |
| **Missing** | **15** | |
| **Total** | **300** | |

*Table 7: Distribution of total earning members per household*

| Monthly HH Income | Frequency | Percent |
|---|---|---|
| **Below 15000** | 189 | 72.14 |
| **15001-30000** | 57 | 21.76 |
| **More than 30000** | 16 | 6.11 |
| **Missing** | **37** | |
| **Total** | **300** | |

*Table 8: Distribution of monthly household income of the respondents*

| Monthly Household Expenditure | Frequency | Percent |
|---|---|---|
| **Below 15000** | 214 | 78.68 |
| **15001-30000** | 50 | 18.38 |
| **More than 30000** | 8 | 2.94 |
| **Missing** | **27** | |

| | | |
|---|---|---|
| **Total** | **300** | |

*Table 9: Distribution of monthly household expenses of the respondents*

| Housing Structure | Frequency | Percent |
|---|---|---|
| **Kacha** | 198 | 68.99 |
| **Semi-Paka** | 74 | 25.78 |
| **Concrete** | 15 | 5.23 |
| **Missing** | **12** | |
| **Total** | **300** | |

*Table 10: Distribution of housing structures of the respondents*

| HH assets | Frequency | Percent |
|---|---|---|
| **Livestocks** | 60 | 26.55 |
| **Boats** | 44 | 19.47 |
| **Pond** | 13 | 5.75 |
| **Land** | 98 | 43.36 |
| **Other** | 11 | 4.87 |
| **Missing** | **73** | |
| **Total** | **300** | |

*Table 11: Distribution of household assets of the respondents*

| | Frequency | Percent |
|---|---|---|
| **No** | 132 | 50.4 |
| **Yes** | 130 | 49.6 |
| **Total** | **262** | |
| **Missing** | **170** | |

*Table 12: Frequency and percentage distribution of respondents' basic knowledge regarding floods and flash floods*

| | Frequency | Percent |
|---|---|---|
| **Heavy rain** | 62 | 30 |
| **God's Will** | 72 | 34 |
| **Barrier Damage** | 6 | 3 |
| **Water came from India** | 69 | 33 |
| **Missing** | 223 | |

| | | |
|---|---|---|
| **Total** | 432 | |

*Table 13: Frequency and percentage respondents' perception regarding the causes of flash floods*

| | Frequency | Percent |
|---|---|---|
| **No** | 344 | 87.1 |
| **Yes** | 51 | 12.9 |
| **Total** | **395** | |
| **Missing** | **37** | |

*Table 14: Frequency and percentage distribution of respondents regarding*

| | Frequency | Percent |
|---|---|---|
| **TV** | 10 | 13 |
| **Social Media** | 7 | 9 |
| **Radio** | 2 | 3 |
| **Miking** | 28 | 38 |
| **Local govt or NGO** | 2 | 3 |
| **Volunteers** | 6 | 8 |
| **Neighbours or friends** | 14 | 19 |
| **Others** | 5 | 7 |
| **Missing** | **358** | |

*Table 15: Frequency and percentage distribution of major sources of warning message for the respondents*

| | Frequency | Percent |
|---|---|---|
| **No** | 37 | 9.7 |
| **Yes** | 345 | 90.3 |
| **Total** | **382** | |
| **Missing** | **50** | |

*Table 16: Percevied impact of the flood on the primary livelihood of the respondents*

| | Frequency | Percent |
|---|---|---|
| **No** | 358 | 94.2 |
| **Yes** | 22 | 5.8 |
| **Total** | **380** | |
| **Missing** | **52** | |

*Table 17: Arrangement of alternative livelihood for the flood affected population*

| Shelter Types | Frequency | Percent |
|---|---|---|
| **Academic Institute** | 177 | 52.2 |
| **Up Office** | 12 | 3.5 |
| **Flood Shelter** | 13 | 3.8 |
| **Others** | 137 | 40.4 |
| **Total** | **339** | |

*Table 18: Types of shelter in the flood affected areas*

| | Frequency | Percent |
|---|---|---|
| **No** | 83 | 32.3 |
| **Yes** | 217 | 68.7 |
| **Total** | **300** | |

Table 19: Safety and security for women and adolescent girls in the shelters

| | Frequency | Percent |
|---|---|---|
| **No** | 299 | 94.3 |
| **Yes** | 18 | 5.7 |
| **Total** | **317** | |
| **Missing** | **115** | |

*Table 20: Occurrence of harassment during the flood*

| | Frequency | Percent |
|---|---|---|
| **Using sanitary pads** | 26 | 10.3 |
| **Using clean cloths** | 118 | 46.8 |
| **Using recyclable cloths** | 84 | 33.3 |
| **Using nothing and staying at home** | 17 | 6.7 |
| **Others** | 7 | 2.8 |
| **Total** | **252** | |
| **Missing** | **180** | |

*Table 21: Management of menstrual needs during flood*

| | Frequency | Percent |
|---|---|---|
| **No** | 322 | 92.5 |
| **Yes** | 26 | 7.5 |
| **Total** | **348** | |

*Table 22: Frequency and percentage distribution of pregnant women in the households of the respondents*

| | Frequency | Percent |
|---|---|---|
| **No** | 294 | 83.1 |
| **Yes** | 60 | 16.9 |
| **Total** | **354** | |

*Table 23: Frequency and percentage distribution of lactating mothers in the households of the respondents*

| | Frequency | Percent |
|---|---|---|
| **No** | 120 | 30.6 |
| **Yes** | 272 | 69.4 |
| **Total** | **392** | |

*Table 24: Frequency and percentage distribution of members in the households attaining education*

| Challenges | Frequency | Percent |
|---|---|---|
| **Academic institutions became shelter and students refrained from going to school** | 104 | 25 |
| **Deprived of getting educational support** | 83 | 20 |
| **Lagged behind other institutions which are not affected** | 48 | 11 |
| **School was closed for few days** | 103 | 25 |
| **Study material was damaged** | 73 | 17 |
| **No electricity** | 3 | 1 |
| **Exam has been delayed** | 2 | 1 |
| **Missing** | **16** | |

*Table 25: Challenges towards education due to flood*

| Level | Frequency | Percent |
|---|---|---|
| **Not difficult at all** | 6 | 2.7 |
| **Slightly difficult** | 28 | 12.4 |
| **Difficult** | 88 | 39.1 |
| **Very difficult** | 103 | 45.8 |
| **Total** | **225** | |

*Table 26: Students' level of difficulty in coping with the situation*

| | Frequency | Percent |
|---|---|---|

| | | |
|---|---|---|
| **No** | 102 | 28.6 |
| **Yes** | 255 | 71.4 |
| **Total** | **357** | |

*Table 27: Frequency and percentage distribution of family members suffering from health problems in the households of the respondents*

| Health Problems | Frequency | Percent |
|---|---|---|
| **Fever** | 239 | 36.71 |
| **Diarrhea** | 95 | 14.59 |
| **Cold** | 163 | 25.06 |
| **Dysentery** | 19 | 2.92 |
| **Skin disease** | 70 | 10.75 |
| **Cholera** | 6 | 0.92 |
| **Typhoid** | 1 | 0.15 |
| **Jaundice** | 2 | 0.31 |
| **Puberty** | 1 | 0.15 |
| **Pregnancy complications** | 3 | 0.46 |
| **Old-age complication** | 29 | 4.45 |
| **Psychological complication** | 13 | 2 |
| **Snake bite** | 1 | 0.15 |
| **Chronic disease** | 9 | 1.38 |

*Table 28: Frequency and percentage distribution of health-related problems faced by the respondents*

| | Frequency | Percent |
|---|---|---|
| **No** | 189 | 71.3 |
| **Yes** | 76 | 28.7 |
| **Total** | **265** | |
| **Missing** | **167** | |

*Table 29: Treatment facilities during the flood*

| Quality | Frequency | Percent |
|---|---|---|
| **Poor** | 34 | 35.4 |
| **Average** | 42 | 43.8 |

| | | |
|---|---|---|
| **Medium** | 8 | 8.3 |
| **Good** | 12 | 12.5 |
| **Total** | **96** | |
| **Missing** | **336** | |

*Table 30: Quality of medical treatment during the flood*

| | Frequency | Percent |
|---|---|---|
| **No** | 306 | 85 |
| **Yes** | 54 | 15 |
| **Total** | **360** | |
| **Missing** | **72** | |

*Table 31: Extent of shelter facilities in the flood affected areas*

| | Frequency | Percent |
|---|---|---|
| **No** | 42 | 12.1 |
| **Yes** | 306 | 87.9 |
| **Total** | **348** | |
| **Missing** | **84** | |

*Table 32: Community people's willingness in relocating themselves to nearby shelters*

| | Frequency | Percent |
|---|---|---|
| **No** | 254 | 87 |
| **Yes** | 38 | 13 |
| **Total** | **292** | |
| **Missing** | **140** | |

*Table 33: Availability of gender-supported space in the shelters*

| | Frequency | Percent |
|---|---|---|
| **No** | 1 | 1.1 |
| **Yes** | 86 | 98.9 |
| **Total** | **87** | |

| | | |
|---|---|---|
| **Missing** | **345** | |

*Table 34: Respondents' account regarding the quantity of toilets in the shelters*

| | Frequency | Percent |
|---|---|---|
| **No** | 300 | 94.9 |
| **Yes** | 16 | 5.1 |
| **Total** | **316** | |
| **Missing** | **116** | |

*Table 35: Availability of medical services in the shelter*

| | Frequency | Percent |
|---|---|---|
| **No** | 20 | 60.6 |
| **Yes** | 13 | 39.4 |
| **Total** | **33** | |
| **Missing** | **399** | |

*Table 36: Extent and quality of medical services in the shelters*

| | Frequency | Percent |
|---|---|---|
| **No** | 26 | 81.3 |
| **Yes** | 6 | 18.8 |
| **Total** | **32** | |
| **Missing** | **400** | |

*Table 37: Extent and quality of doctors' services in the shelters*

| | Frequency | Percent |
|---|---|---|
| **No** | 10 | 31.3 |
| **Yes** | 22 | 68.8 |
| **Total** | **32** | |
| **Missing** | **400** | |

*Table 38: Extent of medicine and healthcare support given to the flood affected people*

| | Frequency | Percent |
|---|---|---|
| **First Aid** | 86 | 52 |
| **Mental health consulting** | 5 | 3 |
| **Hospital facilities** | 22 | 13 |
| **homeopathy** | 9 | 6 |
| **other** | 43 | 26 |
| **missing** | **267** | |

*Table 39: Availability of different types of medical services during the flood*

| | Frequency | Percent |
|---|---|---|
| **No** | 152 | 41.4 |
| **Yes** | 215 | 58.6 |
| **Total** | **367** | |
| **Missing** | **65** | |

*Table 40: Frequency and percentage distribution of respondents based on relief procurement*

| | Frequency | Percent |
|---|---|---|
| **0** | 1 | 0.5 |
| **1** | 107 | 52.7 |
| **2** | 71 | 35 |
| **3** | 16 | 7.9 |
| **4** | 6 | 3 |
| **5** | 2 | 1 |
| **Total** | **203** | |
| **Missing** | **229** | |

*Table 41: Frequency and percentage distribution of the respondents based on the number of times they received flood relief*

| Relief Provider | Frequency | Percent |
|---|---|---|
| **Relative** | 22 | 8 |
| **Neighbours** | 20 | 7 |
| **Club/Foundation** | 61 | 21 |
| **NGO/INGO** | 98 | 34 |
| **Government** | 62 | 22 |
| **Other** | 22 | 8 |
| **Missing** | **147** | |

*Table 42: List of relief providers during the flood*

| Relief Items | Frequency | Percent |
|---|---|---|
| **Groceries** | 89 | 22 |
| **Dry food** | 210 | 50 |
| **Fruits** | 3 | 1 |
| **Cash** | 29 | 7 |
| **Cloths, hotchpotch & sanitary napkin** | 4 | 1 |
| **Water** | 47 | 11 |
| **Water purifying tablet** | 27 | 6 |
| **Child food** | 8 | 2 |
| **Missing** | **15** | |

*Table 43: Types of relief items received by the respondents during the flood*

| Amount | Frequency | Percent |
|---|---|---|
| **Sufficient** | 10 | 4.5 |
| **Somewhat sufficient** | 64 | 29 |
| **Insufficient** | 147 | 66.5 |
| **Total** | **221** | |
| **Missing** | **211** | |

*Table 44: Amount of relief given to the flood affected people*

| Recommended item | Frequency | Percent |
|---|---|---|
| **Readymade food** | 85 | 60 |
| **Money** | 50 | 36 |
| **Pure water** | 6 | 4 |
| **missing** | **291** | |

*Table 45: Recommendations of the respondents regarding flood relief*

| | Frequency | Percent |
|---|---|---|
| **No** | 196 | 93.8 |
| **Yes** | 13 | 6.2 |
| **Total** | **209** | |
| **Missing** | **223** | |

Table 46: Extent of financial/material support for reconstruction and rehabilitation

| Type of Support | Frequency | Percent |
|---|---|---|
| **Money Support** | 4 | 33 |

| | | |
|---|---|---|
| **Steel sheet support** | 5 | 42 |
| **House reconstruction support** | 3 | 25 |
| **Missing** | **420** | |

*Table 47: Types of support flood affected people received after the flood*

| Types of Challenges | Frequency | percent |
|---|---|---|
| **Damaged or stolen home materials** | 146 | 71 |
| **Home or Land Erosion** | 9 | 4 |
| **Electricity Discoonection** | 4 | 2 |
| **Price Hike** | 2 | 1 |
| **Muddy House** | 27 | 13 |
| **Reconstruction Cost** | 11 | 5 |
| **Damaged Roads** | 7 | 4 |
| **Missing** | **226** | |

*Table 48: Types of challenges confronted by the flood affected population*