



## Natural Disaster Management Knowledge and Practices of the Rural Communities in Bangladesh

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### ABSTRACT

This study aims to assess disaster management knowledge and practices among rural residents in four communities of Pabna and Sirajganj Districts, Bangladesh. A survey of 180 households was conducted to collect data. Respondents were randomly selected for interviews without regard to religion or ethnicity. Multistage sampling identified respondents using a structured questionnaire for data collection. Six key informant interviews (KII) were conducted to gather qualitative data. Participants included local social elites, religious leaders, government agencies, and NGOs. Eight case study methods were employed to gather data on natural disasters over time. Each FGD session involved eight to twelve attentive respondents with comparable backgrounds who shared their opinions. The emphasis was on acquiring factual and valuable information verified against other sources. Facilitators employed a discussion guide and documented the proceedings. Data entry was conducted using MS Access, while SPSS-20 was employed for data tabulation. The study indicated notable enhancements in individuals' knowledge, practices, and awareness regarding disaster preparedness, including food preservation, financial savings, secure document storage, and awareness of nearby safe shelters. The study indicated notable enhancements in disaster preparedness, early warning systems, coping strategies, and health and hygiene practices. 98.3% of respondents received early warning messages during floods, whereas only 25% did so. Neighbours and family members were the primary sources of early flood warnings. Research shows that communication media is essential in managing natural disasters. The government should implement initiatives to enhance community awareness of natural disasters and offer disaster preparedness training.

**Keywords:** Natural disaster, disaster management, disaster preparedness, community awareness

## INTRODUCTION

Bangladesh encompasses an area of 147,570 square kilometers and supports a population of 165.16 million individuals (Population and Housing Census 2022), resulting in a population density of 1,119 individuals per square kilometer. The country shares borders with India and Myanmar. Bangladesh is characterized by its low-lying, deltaic geography formed by the Ganges, Brahmaputra, and Meghna rivers. Floods, cyclones, storm surges, riverbank erosion, droughts, and saline water intrusion frequently occur in Bangladesh. Bangladesh has experienced over 200 natural disasters in the past thirty years. The country's closeness to the Bay of Bengal, its low-lying geography, monsoonal patterns, and significant rivers contribute to its heightened susceptibility to natural disasters. Bangladesh is among the nation's most susceptible to the impacts of climate change. The frequency and intensity of weather-related disasters in the country are on the rise. Furthermore, there has been a rise in the frequency and intensity of extreme weather events and hazards, such as soil salinization, rising sea levels, and riverbank erosion.

Bangladesh is notably vulnerable to climate change and susceptible to natural and human-induced hazards. According to the World Risk Report 2015, Bangladesh was ranked as the sixth most vulnerable country to natural disasters among 173 nations globally. The country's geography and climate render it susceptible to various meteorological, hydrological, and geological hazards. Natural hazards arise from heightened rainfall during the monsoon season, elevated sea levels due to climate change, and tropical cyclones. The frequency of natural disasters in the nation is projected to rise due to climate change. Disasters severely impact national agriculture, water supply, food resources, health, and shelter. Future projections suggest that climate change will lead to more than 20 million climate refugees. Bangladesh ranks among the most vulnerable to severe flooding, tornadoes, and destructive cyclones. Flooding and elevated arsenic levels in the soil often lead to water contamination in Bangladesh. The World Health Organization (WHO, 2000) estimates that approximately 77 million individuals in Bangladesh are exposed to toxic arsenic through drinking water.

Bangladesh is susceptible to numerous disasters, including cyclones, earthquakes, droughts, storm surges, and flooding. These disasters are recurrent and inflict harm on individuals and their property. Disasters typically result in loss of life, injuries, property damage and destruction, harm to subsistence and cash crops, disruption of production and lifestyle, loss of livelihood, interruption of essential services, damage to national infrastructure, disruption of

governmental systems, economic losses at the national level, and sociological and psychological repercussions. To manage the disaster effectively, access to national resources is essential. Establishing organizational structures, such as the National Disaster Council (NDC) for policy formulation and the National Disaster Management Office (NDMO) for daily operations is crucial. Additionally, appropriate sections at lower levels of government should be created, and the national disaster management policy must be integrated with other national policies. Furthermore, a national policy for disaster management includes prevention, mitigation, preparedness, response, recovery, and development, all of which enhance the country's overall development.

The country's location in South Asia renders it susceptible to climate change impacts. Bangladesh is identified as a nation with significant vulnerability and high susceptibility to hazards such as flooding, storm surges, and waterlogging. Rural communities often exhibit a less diversified economic base and possess fewer financial resources for disaster mitigation and rebuilding than urban areas (Janssen, 2006). Disaster risk analysis can commence by assessing three pre-impact conditions: hazard exposure, physical vulnerability, and social vulnerability (Lindell, Prater, & Perry, 2007). The geographical location of individuals and the events that threaten their lives dictate a community's exposure to hazards. Physical vulnerability includes human, agricultural, and structural components. The human and social dimensions of vulnerability exhibit considerable complexity. Wisner et al. (2004) define social vulnerability as the capacity of individuals to anticipate, cope with, resist, and recover from the impacts of natural hazards.

The capacity of communities is composed of four key factors. Social capital refers to the robust relationships and networks present within a community. Community competence, assessed via problem-solving strategies, skills, and adaptability, significantly determines community capacity. The dissemination of information within a community and the design and representation of communication infrastructure by reliable information sources constitute essential elements of community capacity. A significant factor influencing a community's capacity building is the equitable distribution of economic resources and risks among its members. These four factors, especially in rural communities, significantly contribute to the enhancement of community capacity building for disaster resilience (Aldrich, 2012; NRC, 2009; Norris et al., 2008; Waugh, 2013).

Various resources have been identified in the literature as essential components of disaster resilience. Frequently cited resources include organizational capacity, economic and physical capacity, social capacity, community competence, and information and communication (Brody, Kang, & Bernhardt, 2010; Cutter et al., 2010; Longstaff, Armstrong, Perrin, Parker, & Hidek, 2010; Norris et al., 2008; Paton, 2007; Sherreib, Norris, & Galea, 2010). Consequently, inquiries into how rural communities can mitigate their vulnerabilities to disasters, enhance their planning capabilities for significant natural events, and effectively manage post-disaster recovery and reconstruction efforts are especially pertinent (Kapucu, Hawkins, & Rivera, 2013).

Research indicates that early warning systems are highly effective in mitigating the impact of natural disasters. An early warning system could effectively contribute to preserving lives in vulnerable communities. Disaster Risk Management (DRM) has emerged as a prominent paradigm in contemporary discourse. The objective is to mitigate disaster-related risks, fatalities, injuries, and adverse effects on livelihood strategies. The United Nations International Strategy for Disaster Reduction (2009) defines disaster risk management as avoiding, reducing, or transferring the negative impacts of hazards through prevention, mitigation, and preparedness activities and measures. The primary components of disaster risk management include risk assessment and prevention. This study aims to evaluate the management system for natural disasters and the accessibility of advanced information regarding their occurrence.

## **METHODOLOGY**

### **Study area**

This survey was carried out in four different villages, namely Diarpachil, Khasbarshimul, Jagannathpur, and Karakola. These villages are located within the Sadar Upazila and Chatmohor Upazila of the Sirajganj and Pabna districts. The Sirajganj Sadar Upazila, which is often referred to as the Sirajganj district, encompasses a total area of 320.15 square kilometers and is located between 24°22' and 24°37' north latitudes and between 89°36' and 89°47' east longitudes. The unions of Sirajganj Sadar Upazila, a region in Bangladesh that has been severely damaged by flooding, are considered in the research area. A network of rivers surrounded it, one of which was the Jamuna. This Upazila experienced flooding annually during the monsoon rainfall, which lasted from July to September. In this particular Upazila,

every single union is susceptible to flooding. This Upazila, which is very susceptible to flooding due to its placement near the Jamuna River and its geographical location, experiences a flood annually. On the other side, the Pabna district in Bangladesh has undergone various natural disasters, including floods, river erosion, and waterlogging. For this reason, the study region has been chosen to include Jagannathpur, Karakola, which is within the Pabna district, and Sirajganj Sadar Upazila.



**Figure 1:** Location of the study area

### Study Design and Data Collection

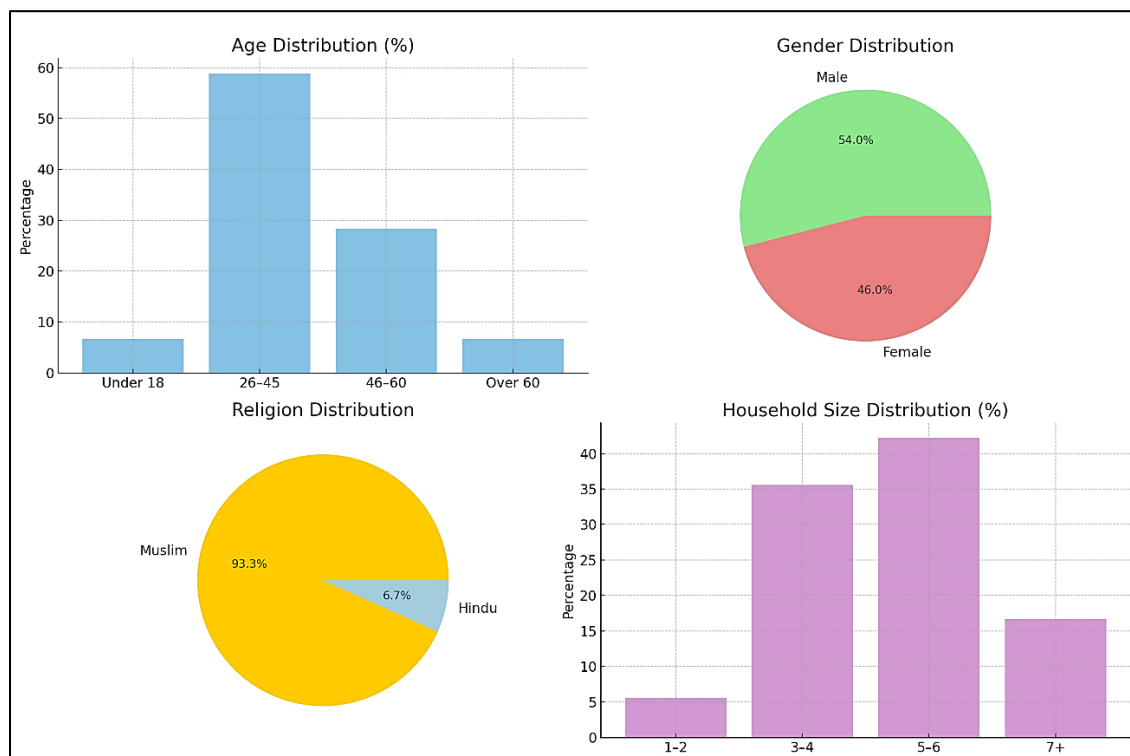
A structured questionnaire was used for the purpose of data collection through the multistage sampling method. A total of 180 households were selected as the sample size for the survey. In this study, respondents were randomly selected for interviewing irrespective of religion and ethnicity groups. A total of 6 KII were conducted. The participants of the Key Informant Interview (KII) were government agencies, NGOs, local social elites (chairman/member, community leader), and religious leaders. In addition, Focus Group Discussion (FGD) was conducted with the community influential, Male and Female. Each FGD session was facilitated by 8-12 watchful respondents with similar backgrounds who provided their opinions. Respondents were randomly selected for interviewing irrespective of religion and ethnicity groups. The facilitators used a discussion guide and recorded the proceedings. In addition, 8 Case study/In-depth study methods were used to collect information on individuals/families, on natural disasters over some time to get information. Intensive training was arranged for the survey personnel (Enumerators, Supervisors and interview coordinators) for data collection in

the Pabna and Sirajganj. The methods for data collection both for quantitative and qualitative interviews and procedures for filling out the questionnaires were thoroughly discussed. Moreover, the procedure of collecting qualitative information and conducting the focus group discussion was explained in detail at the time of training with the interviewing personnel. For data entry MS Access software and data tabulation, SPSS-20 software was used.

## RESULTS AND DISCUSSIONS

### Demographic and socio-economic profile of the households

The research indicates that individuals aged 26 to 45 constitute the predominant segment of respondents (58.9%) in the evaluation study. Approximately 28.3% of the participants were aged between 46 and 60 years. Only 6.7% of the responders were over 60 years of age, while 6.7% were under 18 years old. Approximately 54% of participants were male, whereas 46% were female. Of the interviewees, 93.3% identified as Muslim, whereas 6.7% belonged to Hindu households. 42.2% of households comprised 5 to 6 persons, 35.6% contained 3 to 4 members, and 16.7% included 7 or more members. Merely 5.6% of families comprised one to two members. The mean household size was 5.1.

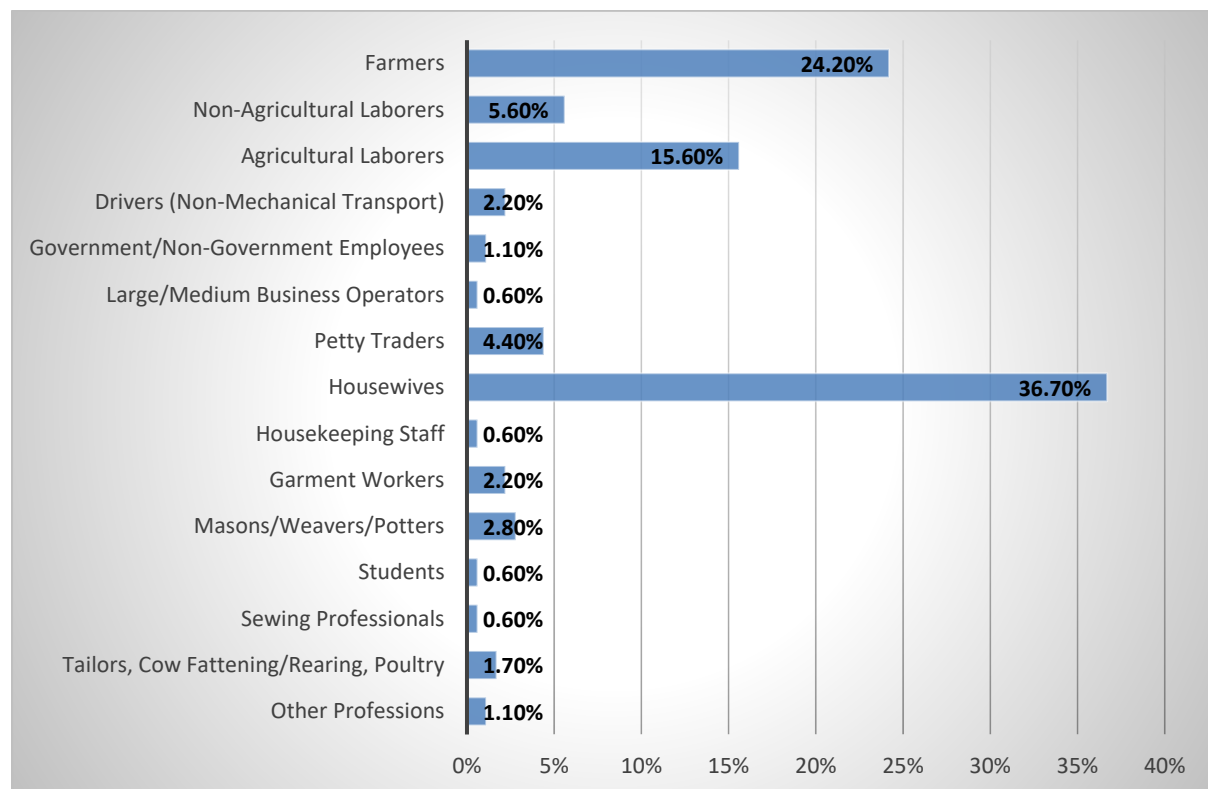


**Figure 2:** Demographic and Socio-Economic profile of the Households

Source: Field Survey, 2023

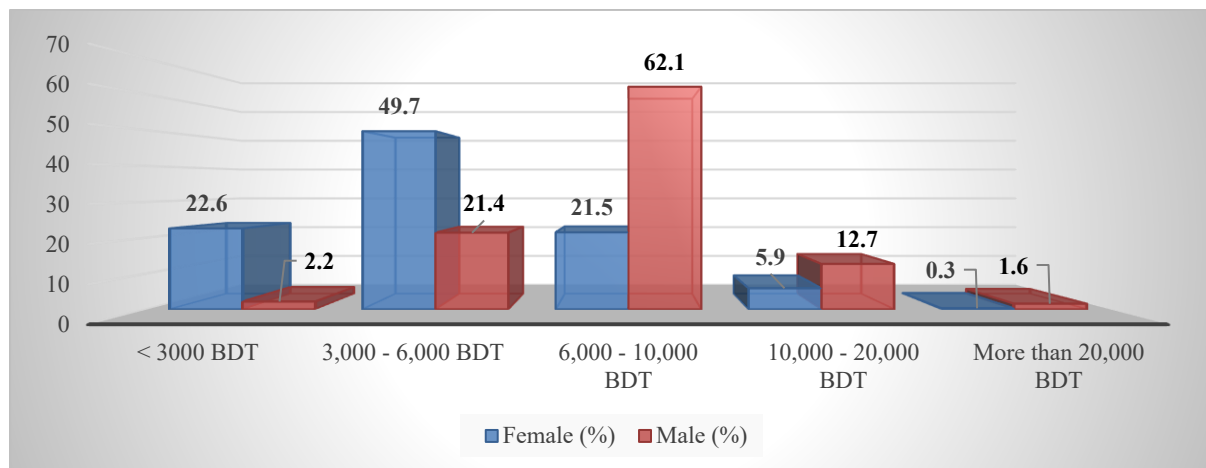
## Primary Occupations and Monthly Household Income

Households relied on several economic sources for their sustenance. The primary occupations of the respondents include large and medium business operators, farmers, non-agricultural laborers, agricultural laborers, drivers of non-mechanical transport, government and non-government employees, petty traders, household housekeeping staff, garment workers, masons, weavers, potters, sewing professionals, tailors, and those engaged in cow fattening, rearing, and poultry farming. Among the homes, 49.8% were male and 50.2% were female. The data concerning the occupations of household heads indicates a varied array of occupational categories: 24.2% are farmers, 5.6% are non-agricultural laborers, 15.6% are agricultural laborers, 2.2% are drivers (non-mechanical transport), 1.1% are government/non-government employees, 0.6% are involved in large/medium businesses, 4.4% are petty traders, 36.7% are housewives, 0.6% engage in housekeeping for other households, 2.2% are garment workers, 2.8% are masons/weavers/potters, 0.6% are students, 0.6% are involved in sewing, 1.7% participate in both tailoring and cow fattening/rearing, poultry rearing, and 1.1% are engaged in other professions. The mean monthly household income from all sources was BDT 8262.2.



**Figure 3:** Occupations and their percentage in households

Source: Field Survey, 2023



**Figure 4:** Percentage distribution of the household's monthly income

Source: Field Survey, 2023

### Common Hazards and Vulnerabilities in the Locality

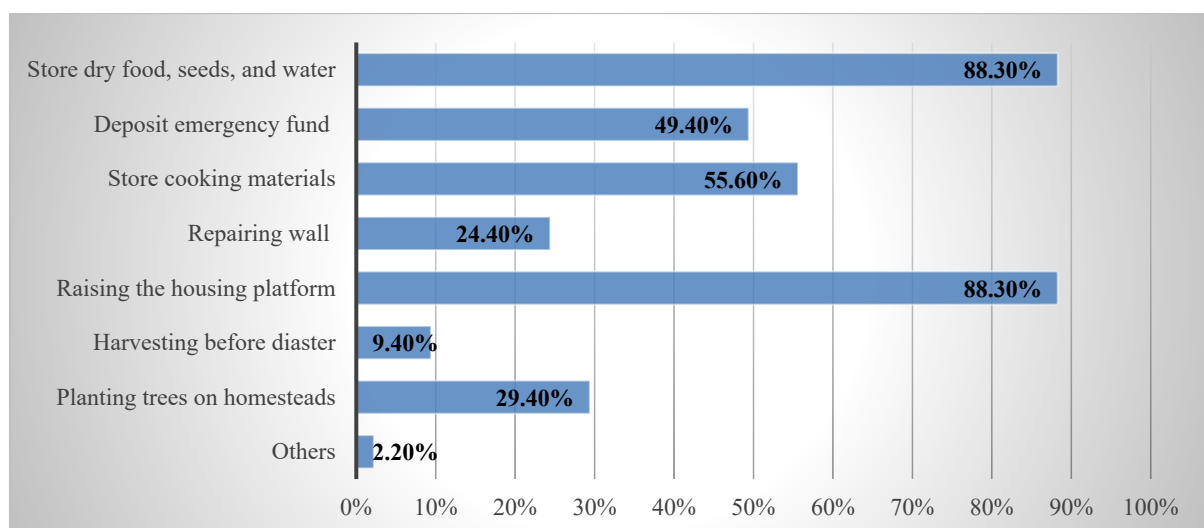
Among the respondents, 91.1% stated that floods were the most devastating disaster for the people in the area, and they were also persistent. 41.7% said that severe cold waves affect their livelihood, and 29.4% mentioned that cyclones or tornadoes are the most devastating event. A good number of respondents (28.9%) mentioned river erosion as the most destructive event in the study area. The earthquake appears to be the least mentioned devastating event (5.5%) for the locality, likely due to its relatively low frequency of occurrence. The FGD and KII further informed us that during floods and river erosion, elderly people, pregnant women, infants, and physically challenged people become most vulnerable.

### Information on Preparedness to face the Disaster Vulnerability

When it comes to addressing the vulnerability of the community to disasters, being prepared is of the utmost importance. One type of measure that helps governments, companies, non-governmental organizations (NGOs), communities, and individuals to respond quickly and efficiently to predicaments involving disasters is the emergency response. For the most part, examples of preparedness measures include the provision of warning systems, emergency communications, public education and awareness, training, the evacuation of populations or the temporary relocation of such populations to safe places, and other similar actions. The information that is presented in Figure 2 illustrates the potential level of preparedness that the respondents have to deal with the risk of a disaster. 88.3 percent of respondents view the act of



storing dry food, seeds, and water as a precautionary measure to face the vulnerability of a disaster. Similarly, the same proportion of respondents (88.3 percent) consider the act of raising the housing platform as a necessary to protect from flood water. The storage of cooking items was identified by 55.6% of respondents as an efficient method of disaster preparedness. There was a significant proportion of respondents, 29.4%, who believed that planting trees on homesteads would be the most effective method of preparedness for natural disasters. During the FGD and KII, on-site visits revealed that residents had planted trees on their homesteads, which had the effect of preventing the wind from blowing during storms and protecting the soil from erosion.



**Figure 5:** Percentage distribution of the respondents according to their response regarding possible preparedness to meet a disaster.

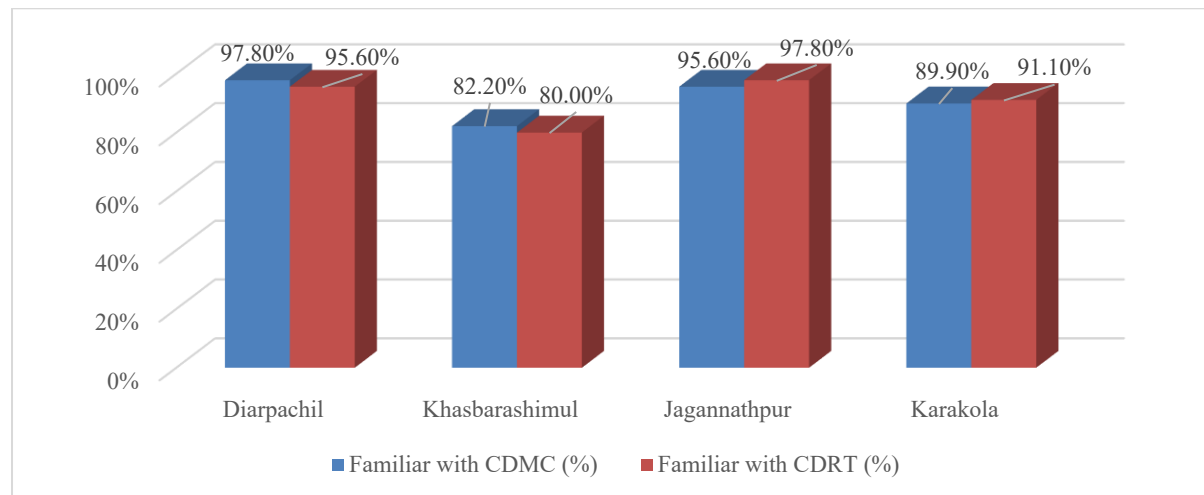
Source: Field Survey, 2023

The majority of respondents (70.7%), who were asked about their disaster readiness, stated that they were keeping themselves informed about pre-disaster warnings as an essential component of their preparedness. Additionally, 51.7% of respondents discussed the reconstruction of roads and dams. As one of the most effective methods to reduce the danger of loss of life and property, disaster preparedness was identified as one of the most effective approaches.

### Knowledge of Local Disaster Management Team

To ensure that the responses to the survey were accurate, we asked the participants to describe the extent to which they were aware with the emergency management operations in their area. When asked about their familiarity and knowledge regarding the Community Disaster

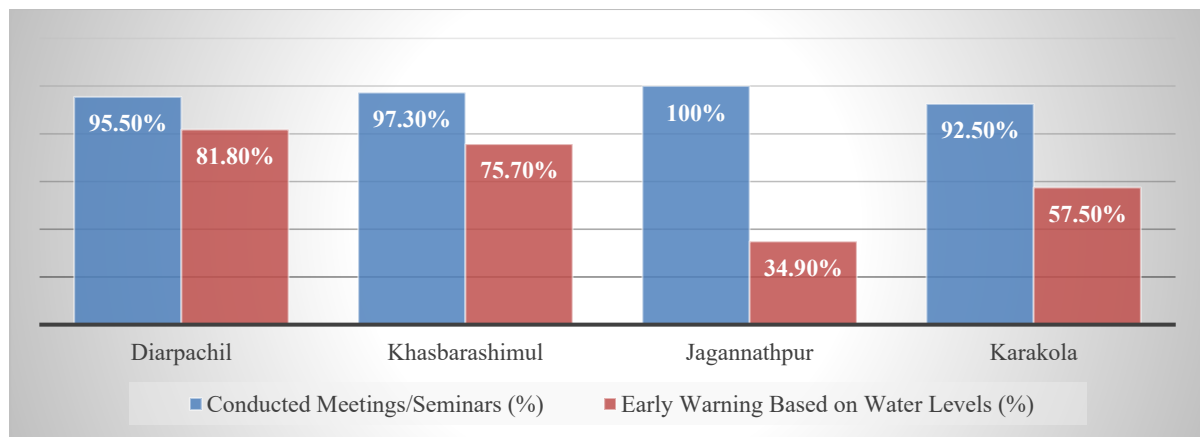
Management Committee (CDMC), Community Disaster Response Team (CDRT), and the functions of these organizations, 91.1% of respondents stated that they were aware of both Community Disaster Management Committees (CDMCs) and Community Disaster Response Teams (CDRTs). 95.6% of people in Diarpachil, 80.0% of people in Khasbarashimul, 97.8% of people in Jagannathpur, and 91.1% of people in Karakola were familiar with CDRT. A total of 5.6% of people were unaware of CDRT, while 3.3% of people did not provide a response.



**Figure 6:** Percentage distribution of the household's knowledge about local Disaster management Team

Source: Field Survey, 2023

The primary functions of CDMC involve conducting meetings and seminars on disaster management and providing early warnings for disasters, particularly with water level issues. 95.5% of respondents from Diarpachil, 97.3% from Khasbarashimul, 100% from Jagannathpur, and 92.5% from Karkola indicated that they have conducted meetings or seminars concerning disaster-related issues. 81.8% of respondents from Diarpachil, 75.7% from Khasbarashimul, 34.9% from Jagannathpur, and 57.5% from Koratola said that they predict early warnings of disasters based on water levels. Numerous programs in the studied region entail the execution of functions by Community Disaster Management Committees (CDMCs) and Community Disaster Response Teams (CDRTs).



**Figure 7:** Functions of CDMC - Meetings & Seminars

Source: Field Survey, 2023

### Information on Emergency Response

Rapid response measures are essential for the preservation of life, the protection of property, and the immediate mitigation of the effects of the disaster, including disruption, damage, and other consequences. Emergency response activities encompass the following: the execution of plans, the execution of search and rescue operations, the provision of emergency food, shelter, and medical assistance, the conducting of surveys and assessments, and the evacuation of vulnerable individuals to the secure zone. In Bangladesh, the official statistics for analyzing existing vulnerability, informing the public of disaster post-vulnerability, and taking appropriate planning actions to prevent disasters are insufficient.

The respondents' perspectives regarding the role of CDRT during the catastrophe of the previous year are summarized in Table 1. The CDRT effectively disseminated early information about the disaster, as stated by 80.6% of the respondents. 34.4% of them reported that they assisted in the distribution of first-aid supply boxes; 37.8% reported that they participated in rescue operations; 34.4% reported that they also provided assistance with rehabilitation; and 47.9% reported that they worked on the distribution of relief material. Additionally, 57.7% of them mentioned that they conducted an assessment of losses. CDRT was instrumental in mitigating calamity vulnerability in their community during the flood of last year, as indicated by the FGD and KII participants.

**Table 1:** Percentage distribution of the household's opinion about CRDT role in ensuring emergency response

| Emergency response role played by CRDT in last year disaster. (Multiple) | Name of community |      |                |      |              |      |          |      | Total |      |
|--|-------------------|------|----------------|------|--------------|------|----------|------|-------|------|
|  | Diarpachil        |      | Khasbarashimul |      | Jagannathpur |      | Karakola |      | N     | %    |
|  | N                 | %    | N              | %    | N            | %    | N        | %    |       |      |
| Disseminate early warning  | 41                | 91.1 | 35             | 77.8 | 35           | 77.8 | 34       | 75.6 | 145   | 80.6 |
| Assessment of lost   | 37                | 82.2 | 27             | 60.0 | 17           | 37.8 | 21       | 46.7 | 102   | 56.7 |
| Assist to distribute first aid kit box                                   | 15                | 33.3 | 9              | 20.0 | 17           | 37.8 | 21       | 46.7 | 62    | 34.4 |
| Assist to rescue activities  | 21                | 46.7 | 11             | 24.4 | 23           | 51.1 | 13       | 28.9 | 68    | 37.8 |
| Assist to rehabilitation   | 13                | 28.9 | 9              | 20.0 | 23           | 51.1 | 17       | 37.8 | 62    | 34.4 |
| Assist to develop list of HH   | 18                | 40.0 | 15             | 33.3 | 14           | 31.1 | 10       | 22.2 | 57    | 31.7 |
| Assist to distribute relief  | 41                | 91.1 | 30             | 66.7 | 3            | 6.7  | 5        | 11.1 | 79    | 43.9 |
| Do not Know (DK)   | 2                 | 4.4  | 9              | 20.0 | 1            | 2.2  | 2        | 4.4  | 14    | 7.8  |
| N (Respondent)   | 45                |      | 45             |      | 45           |      | 45       |      | 180   |      |

During a disaster, 70.0% of respondents proposed transferring livestock to safer places, 63.9% suggested keeping household items and foods in a higher place, and a large number (56.1%) suggested moving to safe shelters. These suggestions were made in regard to the preservation of life and assets. In addition, 56.1% of respondents suggested traveling to shelter facilities or schools in the surrounding area. A total of 88 school sessions were held as part of the initiative in order to enhance students' understanding of disaster susceptibility and protective techniques.

### Information on Early Warning System

The presence of early warning systems in the community was discovered to be known by 95.6% of individuals from Diarpachil, 88.9% from Khasbarashimul, 97.8% from Jagannathpur, and 100% from Karakola following their installation. In general, 95.6% of respondents reported the presence of early warning systems in their respective regions, while 1.7% believed that no early warning systems had been installed in their respective regions. A negligible proportion of 2.8% were unaware that early warning systems were deployed in their respective regions.

In terms of the functions of early warning systems, it was determined that 75.0% of respondents were informed of early warning message forecasting systems at the union level (e.g., miking, mobile SMS, etc.), 82.8% were informed of messages disseminated verbally, 32.2% were informed of emergency meetings of disaster management committees, 12.2% were informed to display a flood flag, and 2.8% were informed to ring a siren or alarm.

**Table 2:** *Percentage distribution of the information on early warning system by local people.*

| The function of early warning system<br>(Multiple)                                  | Name of community |      |                |      |              |      |          |      | Total |      |
|---|-------------------|------|----------------|------|--------------|------|----------|------|-------|------|
|   | Diarpachil        |      | Khasbarashimul |      | Jagannathpur |      | Karakola |      | N     | %    |
|   | N                 | %    | N              | %    | N            | %    | N        | %    |       |      |
| Early warning message forecasting systems at union level (miking, mobile SMS, etc.) | 42                | 93.3 | 39             | 86.7 | 31           | 68.9 | 23       | 51.1 | 135   | 75.0 |
| Message disseminated through verbally   | 41                | 91.1 | 36             | 80.0 | 33           | 73.3 | 39       | 86.7 | 149   | 82.8 |
| Emergency meeting of Disaster management committees                                 | 6                 | 13.3 | 10             | 22.2 | 22           | 48.9 | 20       | 44.4 | 58    | 32.2 |
| To ring/give siren or alarm   | 2                 | 4.4  | 3              | 6.7  |              |      |          |      | 5     | 2.8  |
| Display flood flag  |                   |      | 17             | 37.8 | 3            | 6.7  | 2        | 4.4  | 22    | 12.2 |
| Others  | 2                 | 4.4  |                |      |              |      | 3        | 6.7  | 5     | 2.8  |
| Do not Know (DK)  | 2                 | 4.4  | 5              | 11.1 |              |      |          |      | 7     | 3.9  |
| N (Respondent)  | 45                |      | 45             |      | 45           |      | 45       |      | 180   |      |

### **Local Organizations Response during Disaster Vulnerability**

The study found that 63.9% of respondents said NGOs were the major actors in reducing disaster vulnerability. Here, NGOs refer to organizations such as the Red Crescent/Red Cross, as well as international and local NGOs that have responded to disaster reduction efforts. A sizeable number of respondents thought that it was the government agencies (43.3%) that played a vital role in disaster risk reduction. Several respondents (18.9%) said that the private sector played a vital role in risk reduction during the disaster in the area (Annex Table 9). The respondents from FGD and KII forwarded a similar assessment. As part of their adaptation strategy to the disasters, the FGD and KII respondents informed us that they raised their household platform, built on strong structures, and strengthened communication and community participation.

### **Information on Knowledge, Attitude and Practices (KAP) to Manage Disaster**

The study data showed that 90% of respondents participated in one or more courtyard sessions in their community. Among those who attended courtyard sessions, 36.4% said that they attended DRR sessions, 96.9% attended health sessions, 93.8% attended WASH sessions, 69.1% attended flood early warning & preparedness measure sessions, and 34.0% attended climate change adaptation sessions. There were varied reasons for those who could not attend any courtyard sessions. Some of them lacked information, some faced a financial crisis, some failed to secure permission from male members, and some had other pressing matters to attend to.

To assess mitigation activities, participants were asked the extent to which they are aware of the hazards that create a high level of risk for the community. The study revealed that 94.4% of the respondents had acquired knowledge about early disaster preparation. 82.1% of respondents learned about hygienic practices, and 0.6% became knowledgeable about other issues.

**Table 3:** *Percentage distribution of learning from courtyard session (Multiple) by Community*

| Learning from<br>courtyard sessions       | Name of community |       |                |       |              |       |          |       | Total |       |
|---|-------------------|-------|----------------|-------|--------------|-------|----------|-------|-------|-------|
|   | Diarpachil        |       | Khasbarashimul |       | Jagannathpur |       | Karakola |       | N     | %     |
|   | N                 | %     | N              | %     | N            | %     | N        | %     |       |       |
| Early Preparation of disaster             | 42                | 97.7  | 31             | 93.9  | 38           | 88.4  | 42       | 97.7  | 153   | 94.4  |
| Self-security measurement during disaster | 39                | 90.7  | 25             | 75.8  | 11           | 25.6  | 19       | 44.2  | 94    | 58.0  |
| Hygienic practices                        | 37                | 86.0  | 29             | 87.9  | 34           | 79.1  | 33       | 76.7  | 133   | 82.1  |
| Maternal health care                      | 25                | 58.1  | 24             | 72.7  | 25           | 58.1  | 25       | 58.1  | 99    | 61.1  |
| Child health care                         | 28                | 65.1  | 28             | 84.8  | 19           | 44.2  | 16       | 37.2  | 91    | 56.2  |
| Purification of water                     | 26                | 60.5  | 18             | 54.5  | 19           | 44.2  | 10       | 23.3  | 73    | 45.1  |
| Others                                    | 1                 | 2.3   |                |       |              |       |          |       | 1     | .6    |
| Do not Know (DK)                          |                   |       |                |       | 2            | 4.7   |          |       | 2     | 1.2   |
| Total                                     | 43                | 100.0 | 33             | 100.0 | 43           | 100.0 | 43       | 100.0 | 162   | 100.0 |

The analysis found that 72.8% of respondents participated in the decision-making process of their group. 76.1% knew about complaint response mechanisms. 92.2% said they observed any public theater and MOCK drill in their community. 90.6% said the mock drill was effective for their family as well as their community. Table 3 revealed that 91.7% & 72.8% of respondents learned disaster preparedness & safety of life, respectively, from the MOCK drill. Moreover, 59.4% of respondents also learned about the strategy for reducing disaster.

### Information on Households Learning from MOCK drill

A mock drill serves as a means to evaluate and enhance response procedures, test evacuation protocols, and improve overall emergency preparedness in workplaces and other environments. Mock drills play a vital role in sensitizing employees to emergency situations such as fires,

chemical disasters, floods, cyclones, tsunamis, earthquakes, and other potential hazards that can lead to injuries and losses of lives.

**Table 4:** *Percentage distribution of the households learning from MOCK drill*

| Learning from MOCK drill | Name of community |       |                |       |              |       |          |       | Total |       |
|--------------------------|-------------------|-------|----------------|-------|--------------|-------|----------|-------|-------|-------|
|                          | Diarpachil        |       | Khasbarashimul |       | Jagannathpur |       | Karakola |       | N     | %     |
|                          | N                 | %     | N              | %     | N            | %     | N        | %     |       |       |
| Disaster preparedness    | 39                | 86.7  | 39             | 86.7  | 43           | 95.6  | 44       | 97.8  | 165   | 91.7  |
| Safe of life             | 35                | 77.8  | 37             | 82.2  | 30           | 66.7  | 29       | 64.4  | 131   | 72.8  |
| Strategy to reduce lost  | 34                | 75.6  | 30             | 66.7  | 15           | 33.3  | 28       | 62.2  | 107   | 59.4  |
| Emergency savings        | 9                 | 20.0  | 12             | 26.7  | 8            | 17.8  | 5        | 11.1  | 34    | 18.9  |
| Others                   | 1                 | 2.2   |                |       |              |       |          |       | 1     | .6    |
| DK                       | 6                 | 13.3  | 6              | 13.3  |              |       | 1        | 2.2   | 13    | 7.2   |
| Total                    | 45                | 100.0 | 45             | 100.0 | 45           | 100.0 | 45       | 100.0 | 180   | 100.0 |

Major vulnerabilities identified by the FGD and KII respondents in the target area included flood, drought, earthquake, storm, heavy rain, tornado, waterlogging, diarrhea, pneumonia, and scabies. The vulnerable groups were females, children, the old, and disabled; paralyzed and sick people were usually vulnerable. The study area revealed that the respondents underwent various awareness-building and capacity-building training programs aimed at reducing their vulnerability. The types of training that the respondents received included leadership development, road repair, house repair, fertilizer and seed distribution, slab latrines, tube wells, training on mango and jackfruit fruit plants, and tailoring.

### **Employment Creation and Women Empowerment through Training**

The study found that 12.2% of male and 13.9% of female members of the respondent's households received any skill development training during the last 3 years. 26.7% male from Jagannathpur and 22.2% female from the Karakola community received training. The training



covered topics such as mechanics, carpentry, candle making, handicraft making, sewing, tailoring, electronics, and more. Among the training recipients, 81.8% of males and 88.0% of females mentioned that the training was useful for improving livelihoods. 81.8% of the male training recipients and 80% of the female training recipients had input assistance for IGA. 100% of men and 95% of women with input support found work. The average earnings per month from the newly created income sources stood at BDT 1872.00 for the males and BDT 1345 for the females. Regarding the purposes of using their income, they mentioned purchasing food, clothes, educational materials for their children, saving for future emergencies, and building a house. The study found that 100% of males had the freedom to use earnings as their own choice, and 95.0% of females had the freedom to spend earnings as their own choice.

**Table 5:** *Percentage distribution of the respondent according to their response regarding training*

| Indicators   | Diarpachil |      | Khasbarashimul |     | Jagannathpur |      | Karakola |      | Overall |      |
|--|------------|------|----------------|-----|--------------|------|----------|------|---------|------|
|  | N          | %    | N              | %   | N            | %    | N        | %    | N       | %    |
| Whether any Male member in your family received any skill development training?    |            |      |                |     |              |      |          |      |         |      |
| Male   | 5          | 11.1 |                |     | 12           | 26.7 | 5        | 11.1 | 22      | 12.2 |
| Female   | 5          | 11.1 | 1              | 2.2 | 9            | 20   | 10       | 22.2 | 25      | 13.9 |
| If yes, consider the skill training useful to improve your livelihood              |            |      |                |     |              |      |          |      |         |      |
| Male   | 5          | 100  |                |     | 11           | 91.7 | 2        | 40   | 18      | 81.8 |
| Female   | 5          | 100  | 1              | 100 | 9            | 100  | 7        | 70   | 22      | 88   |
| If received training, have you received any input from CBDRR after having training |            |      |                |     |              |      |          |      |         |      |
| Male   | 4          | 80   |                |     | 11           | 91.7 | 3        | 60   | 18      | 81.8 |
| Female   | 4          | 80   | 1              | 100 | 8            | 88.9 | 7        | 70   | 20      | 80   |
| If received inputs, do you able to create employment with the inputs               |            |      |                |     |              |      |          |      |         |      |
| Male   | 4          | 100  |                |     | 11           | 100  | 3        | 100  | 18      | 100  |
| Female   | 4          | 100  | 1              | 100 | 8            | 100  | 6        | 85.7 | 19      | 95   |
| Average Monthly income   |            |      |                |     |              |      |          |      |         |      |
| Male   | 1300.00    |      |                |     | 1818.18      |      | 2833.33  |      | 1872.22 |      |
| Female   | 1625.00    |      | 2500.00        |     | 1375.00      |      | 985.71   |      | 1345.00 |      |
| Have the freedom to use the money  |            |      |                |     |              |      |          |      |         |      |
| Male   | 100        |      |                |     | 100          |      | 100      |      | 100     |      |

| Indicators   | Diarpachil |      | Khasbarashimul |      | Jagannathpur |      | Karakola |      | Overall |      |
|--|------------|------|----------------|------|--------------|------|----------|------|---------|------|
|  | N          | %    | N              | %    | N            | %    | N        | %    | N       | %    |
| Female   | 100        |      | 100            |      | 100          |      | 85.7     |      | 95.0    |      |
| Whether any member of your family received training for farm production? |            |      |                |      |              |      |          |      |         |      |
| Male   | 11         | 24.4 | 9              | 20.0 | 13           | 28.9 | 5        | 11.1 | 38      | 21.1 |
| Female   | 6          | 13.3 | 12             | 26.7 | 8            | 17.8 | 8        | 17.8 | 34      | 18.9 |

## CONCLUSION

The most vulnerable individuals in the studied area are older individuals (both male and female), pregnant women, children, and marginal farmers. Only 7.9% of respondents were aware of community-based disaster management committees (CDMCs). The FGD and KII results indicate that all CDMCs are functioning properly. They conduct meetings on a regular basis, maintain minutes, distribute early warning messages, and oversee disaster emergency funds. Local NGOs and other organizations implemented flood early warning systems in their communities by conducting mock exercises, conducting simulations, and organizing courtyard meetings to discuss flood early warning and preparation. The study communities experienced a substantial increase in their awareness of early flood warnings. The research revealed that individuals' preparedness for disaster, early warning systems, and coping mechanisms were significantly enhanced. The majority of respondents (98.3%) received early warning messages during disasters. The respondents reported that they received early warning messages from a variety of sources, with the majority (90.0%) receiving them from volunteers or the disaster committee of the Bangladesh Red Crescent Society. One-fourth (26.1%) of the respondents had a member who participated in skill and employment creation training. Subsequent analysis indicates that 13.9% of the females in the responding households participated in training, and 88% of them perceived skill training as a means of securing employment. Inputs for the development of IGA sources were received by 80.0% of the female training recipients. IGAs were participated in by 95% of the females who were trained and received input.

According to their statement, they were able to allocate their average monthly earnings of 1345 BDT as they saw fit. Members of all communities are cognizant of the importance of disaster preparedness and early warning. In order to alleviate vulnerable conditions, the union parishad, ward, and local government have implemented a variety of initiatives. Their interventions included financial support, rehabilitation, and allowances for elderly individuals, widows, the

disabled, pregnant women, and lactating mothers. In order to construct cyclone shelters, box culverts, and earthen roads, they conducted orientations and awareness workshops regarding the disaster. The study area experienced an increase in the provision of training on capacity building, disaster awareness, road and house repairs, fertilizer and seed distribution, the installation of slab latrines and tube wells, the planting of fruit plants such as mango and jackfruit, tailoring training, and the distribution of sewing machines. Floods, storms, droughts, river erosion, excessive rainfall, tornadoes, and waterlogging were identified as the primary vulnerabilities in these regions during the FGD and KII surveys conducted with a variety of stakeholders.

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