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# COPING WITH NATURAL DISASTERS: A CROSS-SECTIONAL STUDY WITH PEOPLE WITH DISABILITIES IN THE COASTAL ZONE OF BANGLADESH

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**Abstract:** Coastal zone of Bangladesh is highly vulnerable to different nature induced hydrological and climatological disasters. Disaster disproportionately affects a different group of populations. Among them, "people with disabilities" (PWDs) regardless of their gender face severe challenges in a disaster situation. The response mechanisms of disabled people in disaster context are also different. This paper aimed to examine the coping strategies of PWDs with a natural disaster in the coastal zone of Bangladesh. We conducted a cross-sectional survey among 150 disabled people from Mongla sub-district, Rampal sub-district and Sharankhola sub-district of Bagerhat district. Most of the respondents (60%) did not receive any training on disaster preparedness but the majority of them (88%) had knowledge on the location of the nearest disaster shelters and took shelter at government listed centers before or during the disaster. They were not satisfied with the facilities and services of those disaster shelters. Nearly two-thirds (64%) of the respondents received disaster forecasting through electronic media. More than one-fifth of the respondents (22.7%) changed their occupations after a major disaster and one-fourth of the respondents (26.7%) were displaced or migrated from their original house as a consequence of the disaster. Although disabled people are one of the most vulnerable groups in disaster milieu, they have drawn limited attention by the policymakers, academicians and development organizations. This paper provides few coping strategies of disabled people that will help the policymakers to think and take disabled friendly measures in policy documents and development interventions.

**Keywords**: people with disabilities, coping strategies, coastal zone, natural disasters

## Introduction

According to the World Report on Disabilities, around 15% of the world population lives with disability (World Health Organization [WHO] & World Bank, 2011). They are often overlooked and seen as a burden of the society (Kelman, & Stough, 2015). People with disability (regardless of disability) are vulnerable group to both natural and manmade disasters. The vulnerability of

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disabled people in disaster milieu can be amplified without effective and efficient intervention from government authorities and other allied organizations and can ultimately diminish their capacities (Gaillard & Cadag, 2009; Ronoh, Gaillard, & Marlowe, 2015). For example, physical disability or blindness may limit their effective response to disasters. They are one of the most marginalized groups, often excluded from the mainstream development processes (Priestley & Hemingway, 2007; Polu, Mong, & Nelson, 2015), and from the planning processes of disaster risk reduction program (Ronoh, Gaillard, & Marlowe, 2015).

There is an agreement on the relationship between disability and disaster vulnerability regardless of the context in which people live (Smith, Jolley, & Schmidt, 2012). Disabled people have some context-specific requirements in any disaster events that need to be addressed. However, people with disabilities suffer from a lack of access to adequate education services, health services, and safety nets. This lack of access has led to exclusion from social and economic activities (Ali, 2014). Disability unevenly affects poor and vulnerable populations (United Nations International Strategy for Disaster Reduction [UNISDR], 2015). In developing countries, disabled people are poorer than their nondisabled peers in accessing health care services, education, income, employment, social support, and civic involvement (Tareque, Begum, & Saito, 2014). As a result, they have lower level of education, employment, and wages if employed.

The awareness of the needs of disabled people in disaster situation has gained special momentum among the international communities in the last two decades (Stough & Kang, 2015). States would realize their obligations to respect, protect, and fulfill basic human rights, including the rights to safety of vulnerable people exposed to hazards (Ronoh, Gaillard, & Marlowe, 2015). Article 11 of the United Nations Convention on the Rights of Persons with Disabilities (United Nations [UN], 2006) declares “States Parties shall take, in accordance with their obligations under international law, including international humanitarian law and international human rights law, all necessary measures to ensure the protection and safety of persons with disabilities in situations of risk, including situations of armed conflict, humanitarian emergencies and the occurrence of natural disasters”. The Sendai Framework for Disaster Risk Reduction 2015–2030 (SFDRR) also recognized disability-related needs and related references all through the document (UNISDR, 2015).

Bangladesh is recognized as one of the disaster-prone countries in the world. Every year this country is severely affected by hydrological, meteorological and

climatological disasters. Disability is complex and multidimensional concept (WHO & World Bank, 2011). Disabled people are extremely vulnerable to any kind of disasters. They are the poorest of the poor in both developed and developing countries (Priestley & Hemingway, 2007). Disability and poverty are inextricably linked (Groce, Kett, Lang, & Trani, 2011) because the impacts of ecological hazards rapidly turn into disasters for the poorest, marginalized and most excluded groups (Wisner, Blaikie, Cannon, & Davis, 2003). The combination of disability and poverty amplify the processes of exclusion (Ali, 2014). Exclusion from participation of disabled people in different layers of decision making processes results inaccessible disaster preparedness for them. Disability also menaces their individual, family and social life (Hosain, Atkinson & Underwood, 2002). The consequences of poverty are particularly severe for individuals with disabilities and their families (Eide & Ingstad, 2013). These issues are particularly more relevant for Bangladesh because this country is frequently hit by natural disasters and higher level of poverty incidence. There is no common consensus on the prevalence of disability in Bangladesh. Different organizations guesstimated this number in different ways. For example, the percentage of disabled population in Bangladesh according to Population Census in 2011 was 1.41% (Bangladesh Bureau of Statistics [BBS], 2015), whereas, 9.07% (BBS, 2011) as per Household and Income Expenditure Survey (HIES). However, the absolute number of disabled people in the country may be higher than this estimate (Ali, 2014).

The poor and marginalized people of developing countries are the most vulnerable to disasters (Djordjević, Radivojević, Dragović, & Filipović, 2016). They have limited financial capacity to reduce their exposures and develop several adjustment strategies to face the disaster events. Coping mechanisms and other strategies used to face natural hazards are typically rooted in people's day to day livelihoods (Haque & Etkin 2007; Ronoh, Gaillard, & Marlowe, 2015). Majority of disaster researches in Bangladesh highlights the effects of natural hazards on vulnerable groups like female, children and elderly and their coping mechanisms. A very few researches focus on people with disabilities (regardless of their disability) and their experiences in pre-disaster, during disaster and post-disaster period. People have inadequate resources to defend themselves and rebuild their lives after a disaster. (Nahar, Blomstedt, Wu, Kandarina, Trisnantoro, & Kinsman, 2014). Tareque, Begum and Saito (2014) studied on wealth inequality in disability in Bangladesh. The cumulative cost (four cost components including costs due to lack of access to employment; costs due to children with disabilities losing out on school; costs due to adults helping people with disabilities; and costs due to children helping a family member with disabilities) of disability in Bangladesh is approximately US $1.18 billion per

year (Ali, 2014). The prevalence of disability is higher among the rural community (Islam, Bhowmik, Islam, Renzaho, & Hiller, 2016). Therefore, in rural areas disability has a devastating effect on the quality of life of the disabled people (Hosain, Atkinson & Underwood, 2002). Mahmud, Mahmud, & Rahman (2014) identified several challenges faced by disabled people during disasters, including unfavorable conditions, psychological effects, physical difficulties, and environmental challenges. They are disproportionately affected by the impacts of a disaster and during the response phase (Twigg, Kett, Bottomley, Tan, & Nasreddin, 2011; Stough, Sharp, Resch, Decker, & Wilker, 2016). Therefore, it is essential to know the coping practices of disabled people in disaster context. Realizing the gaps in the existing peer-reviewed literature, this study attempted to examine the coping mechanisms of disabled people in disaster prone coastal district of Bangladesh. More specifically, this study focused on exploring the socio-demographic and economic characteristics of PWDs as well as their coping strategies in several meteorological (cyclone, storm surge) and hydrological (flood) disasters.

## Conceptual framework

There are various reasons for disability including birth complications, child malnutrition, genetics, maternal malnutrition, incidences of particular diseases, lack of early detection, lack of awareness, lack of access to proper treatment, and poverty (Ali, 2014). In 2001 the Parliament of Bangladesh enacted "*Bangladesh Persons with Disability Welfare Act-2001*" (Parliament of Bangladesh, 2001, p. 2–3) which defines disability as "any person who is physically crippled either congenitally or as result of disease or being a victim of accident, or due to improper or maltreatment or for any other reasons became physically incapacitated or mentally imbalanced, and as a result of such crippledness or mental impairedness, has become incapacitated, either partially or fully; and is unable to lead a normal life". To meet the purpose of this study, we included a person who is physically crippled, visually impaired, hearing impairment, speech impairment or belong to multiple disabilities.

Disability is a multidimensional concept with objective and subjective characteristics (Baldassarre, Battisti, Rosano, & Solipaca, 2008). There are different perspectives on disability: impairment perspective, functional limitation perspective, and ecological perspective (Das, 2010). This study conceptualized disability from *Ecological Perspective* which considers disability as consequential outcome from the interaction of impairment, activity limitations and restrictions from participation in a specific social or physical environment such as work, home or school (Baldassarre, Battisti, Rosano, & Solipaca, 2008).

The Quebec disability production process model presents disability as the interaction of three kinds of factors: personal factors (age, sex and cultural identity), environmental factors (the social context in which the person lives) and life habits (the person's daily activities) (Fougeyrollas, Cloutier, Bergeron, Côté, & St-Michel, 1999). According to this model, disability depends on environment where a person lives and if the environment is adapted to this person, the disability can change or even disappear (Baldassarre, Battisti, Rosano, & Solipaca, 2008; Das, 2010). The Quebec model urges for; even though impairment has an objective reality that is attached to the body or mind, disability has more to do with society's failure to account for the needs of persons with disabilities (Baldassarre, Battisti, Rosano, & Solipaca, 2008).

## Methodology

A survey was conducted among "persons with disabilities" in coastal region in Bangladesh. We collected the data from three sub-districts of Bagerhat district. There was no sampling frame for this study, although several non-governmental organizations had their PWDs beneficiary lists. To identify the study respondents, this study used transect walks and informal discussions with community gatekeepers and local people. The inclusion criteria of respondents for this survey were disability and age (more than 20 years). We excluded those people who were below 20 years and unwilling to participate in the survey. We also excluded mental health impairments. Using the snowball sampling, we selected 150 respondents from the study area in consideration with inclusion and exclusion criteria. We also conducted 2 key informants interviews (KII) with targeted respondents (with both male and female). Data were collected in December 2014.

A questionnaire was used to conduct interview with PWDs. We also performed a field test of the questionnaire in November 2014 and based on the field test necessary corrections and modifications were made. The data collectors (6 data collectors) were received a training on the objective, interview processes, exclusion and inclusion criteria of respondents, and confidentiality of collected data prior to collect data from study area. The questionnaire was developed to collect the information on socio-demographic and economic conditions of PWDs as well as their coping mechanisms with natural disasters. All the filled questionnaires were cross-checked manually and then entered into Microsoft Office Excel 2007 package. All costs were expressed in Bangladeshi Taka (Tk.), applying the exchange rate (US$ 1 = Tk. 77.9) of December 2014 (Bangladesh Bank, 2017).

In 2011, around 1.56% population of Khulna division was disabled and higher percentage in rural area (1.60%) compare to urban area (1.37%) (BBS, 2015). This study was conducted in rural settings of Mongla sub-district, Rampal sub-district and Sharankhola sub-district under Bagerhat district of Khulna division (Figure 1). Bagerhat district is a coastal district which is exposed to Bay of Bengal and severely affected by cyclone Sidr in 2007 and cyclone Ayla in 2009. In addition to cyclone, flooding, water logging, tidal surge and salinity intrusion are also common hazard in this locality. The number of extreme poor people in Bagerhat district was around 24% in 2010 (World Bank, World Food Programme [WFP] and BBS, 2010). Among these three sub-districts, Mongla (22.7%) had higher rate of extreme poor people followed by Sharankhola (28.2%) and Rampal (22.5%) (World Bank, WFP & BBS, 2010). Poverty and disasters closely link in the study area. Therefore, living with a disability in this region is somehow difficult and challenging.

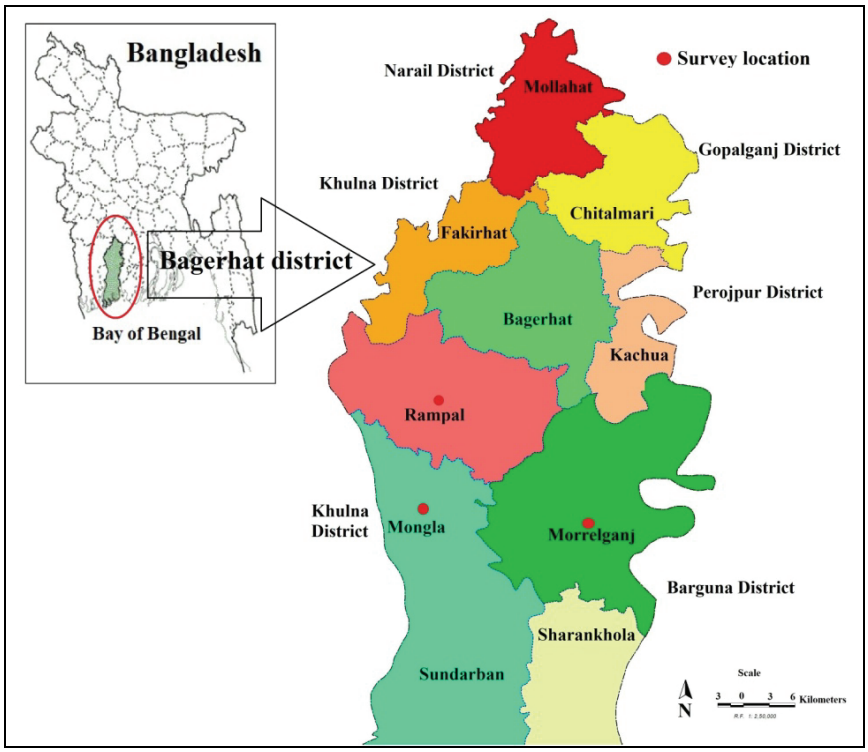


Figure 1: Map of the study area (Source: Local Government Engineering Department, Dhaka, Bangladesh)

All the study participants were informed about the objective of this study and were agreed to participate in the survey. The name and quotes of respondents were de-identified to protect the confidentiality and privacy of the respondents.

## Results

### *Socio-demographic and economic characteristics of the respondents*

The socio-demographic and economic attributes of the respondents are shown in Table 1. More than half of the respondents were male (60%). Most of them were within the age group of 31 to 40 years (40%), married (56%) and lived with extended family (64%). Education level of the respondents was determined based on the highest level of education they had completed at the time of the interview and it was observed most of the respondents were illiterate (48%).

Table 1. Socio-demographic and economic characteristics of the respondents (parenthesis indicated percentage)

| Variables | Mongla sub-district N (%) | Rampal sub-district N (%) | Sharankhola sub-district N (%) | Total N (%) |
|---|---|---|---|---|
| Gender | | | | |
| Male | 25 (16.7) | 30 (20.0) | 35 (23.3) | 90 (60.0) |
| Female | 25 (16.7) | 20 (13.3) | 15 (10.0) | 60 (40.0) |
| Age group of respondents | | | | |
| 20 to 30 | 12 (8.0) | 10 (6.7) | 10 (6.7) | 32 (21.3) |
| 31 to 40 | 20 (13.3) | 20 (13.3) | 20 (13.3) | 60 (40.0) |
| 41 to 50 | 10 (6.7) | 10 (6.7) | 10 (6.7) | 30 (20.0) |
| 51 to 60 | 2 (1.3) | 4 (2.7) | 4 (2.7) | 10 (6.7) |
| More than 60 | 6 (4.0) | 6 (4.0) | 6 (4.0) | 18 (12.0) |
| Marital status | | | | |
| Married | 24 (16.0) | 32 (21.3) | 28 (18.7) | 84 (56.0) |
| Unmarried | 14 (9.3) | 10 (6.7) | 15 (10.0) | 39 (26.0) |
| Widow | 0 (0.0) | 1 (0.7) | 2 (1.3) | 3 (2.0) |
| Divorced | 3 (2.0) | 0 (0.0) | 0 (0.0) | 3 (2.0) |
| Never married (due to disability) | 9 (6.0) | 7 (4.7) | 5 (3.3) | 21 (14.0) |

Source: Fieldwork conducted by the first author in 2014

Table 1. Socio-demographic and economic characteristics of the respondents (parenthesis indicated percentage)

| | | | | |
|---|---|---|---|---|
| Family types | | | | |
| Nuclear family | 20 (13.3) | 16 (10.7) | 18 (12.0) | 54 (36.0) |
| Extended family | 30 (20.0) | 34 (22.7) | 32 (21.3) | 96 (64.0) |
| Education | | | | |
| Illiterate | 30 (20.0) | 24 (16.0) | 18 (12.0) | 72 (48.0) |
| Literate | 4 (2.7) | 7 (4.7) | 10 (6.7) | 21 (14.0) |
| Completed primary level education | 10 (6.7) | 12 (8.0) | 20 (13.3) | 42 (28.0) |
| Completed secondary level education | 4 (2.7) | 6 (4.0) | 2 (1.3) | 12 (8.0) |
| Completed higher secondary level education and more | 2 (1.3) | 1 (0.7) | 0 (0.0) | 3 (2.0) |
| Housing pattern | | | | |
| Made of corrugated tin | 26 (17.3) | 24 (16.0) | 31 (20.7) | 81 (54.0) |
| Made of bamboo | 10 (6.7) | 11 (7.3) | 3 (2.0) | 24 (16.0) |
| Made of mud | 10 (6.7) | 10 (6.7) | 13 (8.7) | 33 (22.0) |
| Made of palm leaves | 4 (2.7) | 5 (3.3) | 3 (2.0) | 12 (8.0) |
| Mobile phone possession | | | | |
| At family level | 49 (32.7) | 48 (32.0) | 45 (30.0) | 142 (94.7) |
| Male respondents | 7 (4.7) | 7 (4.7) | 3 (2.0) | 17 (11.4) |
| Female respondents | 4 (2.7) | 2 (1.3) | 1 (0.7) | 7 (4.7) |
| Employment status | | | | |
| Employed/ self employed | 10 (6.7) | 14 (9.3) | 30 (20.0) | 54 (36.0) |
| Unemployed | 40 (26.7) | 36 (24.0) | 20 (13.3) | 96 (64.0) |
| Causes of disability | | | | |
| By birth | 33 (22.0) | 37 (24.7) | 41 (27.3) | 111 (74.0) |
| Illness | 10 (6.7) | 8 (5.3) | 6 (4.0) | 24 (16.0) |
| Accident | 7 (4.7) | 5 (3.3) | 3 (2.0) | 15 (10.0) |
| Types of disability | | | | |
| Blind | 10 (6.7) | 14 (9.3) | 12 (8.0) | 36 (24.0) |
| Dumb | 6 (4.0) | 8 (5.3) | 4 (2.7) | 18 (12.0) |
| Physically disabled | 28 (18.7) | 24 (16.0) | 26 (17.3) | 78 (52.0) |
| Multidimensional disability | 4 (2.7) | 4 (2.7) | 0 (0.0) | 8 (5.3) |
| Others | 2 (1.3) | 0 (0.0) | 8 (5.3) | 10 (6.7) |

Source: Fieldwork conducted by the first author in 2014

Among all respondents, the highest percentage of illiteracy was found for Mongla sub-district (20%) and completed primary education or more for Sharankhola sub-district (14.6%). Houses of the respondents were mostly made of corrugated tin (54%), followed by mud made (22%) and bamboo made

(16%). Most of the respondents were unemployed (64%) during survey period. Among all respondents, the highest percentage of unemployed was found for Mongla sub-district (26.7%) and employed for Sharankhola sub-district (20%). Considering the reason of disability, the highest percentage of people was disabled by birth (74%). Among all respondents, most of them were physically impaired (52%), followed by blind (24%) and dumb (12%). Although most of the households (95%) used mobile phone, disabled females have limited access to information technology as identified by the survey.

*Coping strategies developed by the respondents*

Coping strategies have been defined as individual or community responses on a short-term basis to changing environmental conditions, or responses to its outcome (Davies, 1993). This section describes different coping mechanisms in pre-disaster, during-disaster and post-disaster period. Table 2 presents different coping strategies developed by the respondents to adjust with disaster situation. Most of the respondents (60%) did not receive any training on disaster preparedness. Among them more than 66% of the female respondents (Figure 2) did not receive any training on disaster preparedness.

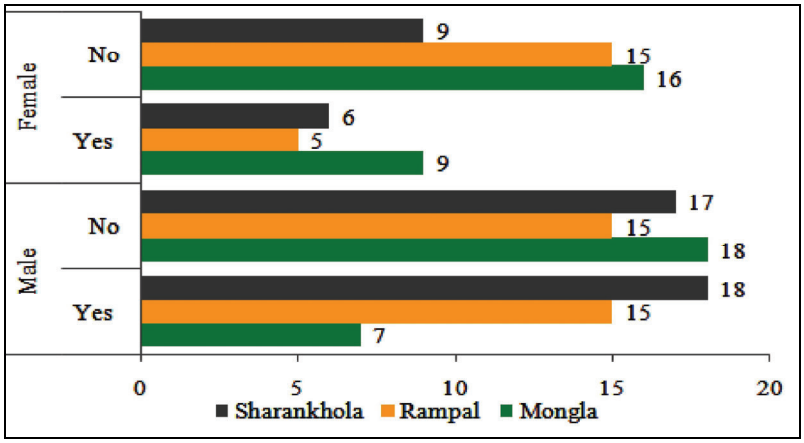


Figure 2. Sex-wise distribution of respondents (in numbers) received training on disaster preparedness

Nevertheless, majority (88%) of them had knowledge on the nearest disaster shelters with its exact location. Among the respondents, most of them (64%) received disaster forecasting through electronic media e.g. television or radio and some of them (21.3%) received forecasting news from their relatives or neighbors. Although, all respondents were not satisfied with the facilities at

disaster shelters, majority of them (88%) took shelter at government listed centers before or during disaster. Among them around three-fifth (59.1%) of the respondents were able to reach in shelter with the help of family members, but one-fifth of the respondents (22%) never received any support to reach in shelter even though they faced severe challenges to reach.

Table 2: Coping strategies developed by the respondents (parenthesis indicated percentage to the total sample)

| Variables | Mongla sub-district N (%) | Rampal sub-district N (%) | Sharankhola sub-district N (%) | Total N (%) |
|---|---|---|---|---|
| Received training on disaster preparedness | | | | |
| Yes | 16 (10.7) | 20 (13.3) | 24 (16.0) | 60 (40.0) |
| No | 34 (22.7) | 30 (20.0) | 26 (17.3) | 90 (60.0) |
| Knowledge about disaster shelter and its location | | | | |
| Know nearest shelter and its location | 46 (30.7) | 42 (28.0) | 44 (29.3) | 132 (88.0) |
| Do not know | 4 (2.7) | 8 (5.3) | 6 (4.0) | 18 (12.0) |
| Sources of receiving forecasting on disaster | | | | |
| Electronic media (Radio/ TV) | 40 (26.7) | 30 (20.0) | 26 (17.3) | 96 (64.0) |
| Relatives/ neighbor | 6 (4.0) | 10 (6.7) | 16 (10.7) | 32 (21.3) |
| Local volunteers | 4 (2.7) | 2 (1.3) | 6 (4.0) | 12 (8.0) |
| Others | 0 (0.0) | 8 (5.3) | 2 (1.3) | 10 (6.7) |
| Location of the nearest shelter(s) | | | | |
| Less than 1 km | 7 (4.7) | 15 (10.0) | 12 (8.0) | 34 (22.7) |
| 1 km to 2 km | 15 (10.0) | 14 (9.3) | 8 (5.3) | 37 (24.6) |
| More than 2 km | 28 (18.7) | 21 (14.0) | 30 (20.0) | 79 (52.7) |
| Sheltered at government listed centers during disaster (last disaster) | | | | |
| Yes | 46 (30.7) | 41 (27.3) | 45 (30.0) | 132 (88.0) |
| No | 4 (2.7) | 9 (6.0) | 5 (3.3) | 18 (12.0) |
| Help received to reach shelter (last disaster) | | | | |
| Family members | 25 (18.9) | 20 (15.2) | 33 (25.0) | 78 (59.1) |
| Members from organization | 2 (1.5) | 4 (3.0) | 4 (3.0) | 10 (7.6) |
| Able to reach without support | 8 (6.1) | 4 (3.0) | 3 (2.3) | 15 (11.4) |
| Never received any support | 11 (8.3) | 13 (9.8) | 5 (3.8) | 29 (22.0) |

Source: Fieldwork conducted by the first author in 2014

Table 2: Coping strategies developed by the respondents (parenthesis indicated percentage to the total sample)

| | | | | |
|---|---|---|---|---|
| Problem faced during disasters | | | | |
| Yes | 20 (13.3) | 24 (16.0) | 27 (18.0) | 71 (47.3) |
| No | 30 (20.0) | 26 (17.3) | 23 (15.3) | 79 (52.7) |
| Changed occupation after disasters | | | | |
| Yes | 13 (8.7) | 10 (6.7) | 11 (7.3) | 34 (22.7) |
| No | 37 (24.7) | 40 (26.7) | 39 (26.0) | 116 (77.3) |
| Displaced/ migrated after disasters | | | | |
| Yes (Migrated) | 17(11.3) | 12(8.0) | 11(7.3) | 40 (26.7) |
| No (never migrated) | 33 (22.0) | 38 (25.3) | 39 (26.0) | 110 (73.3) |
| Received allowance from government/ NGOs | | | | |
| Yes | 9 (6.0) | 7 (4.7) | 11 (7.3) | 27 (18.0) |
| No | 41 (27.3) | 43 (28.7) | 39 (26.0) | 123 (82.0) |

Source: Fieldwork conducted by the first author in 2014

However, more than half of the respondents (52.7%) notified that they did not face any problem during disasters. As a post-disaster coping strategy, a significant percentage of the respondents (22.7%) changed their occupations aftermath of disasters and more than one-fourth of the respondents (26.7%) were displaced or migrated from their original house.

## Discussion

Physically disabled people face many challenges in disaster context, including evacuation, access to disaster shelters, improper sanitation and many more. This study found majority of the respondents were physically crippled (52%) by birth (Table 1). As a result, they faced many challenges to reach and stay in disaster shelters.

Poverty and geographical vulnerability to disasters in the study area leave disabled people at high risks. Among all types of disabled people, female with disabilities were found more vulnerable, disadvantaged and marginalized group. Men, children or elderly people can be physically carried by anyone to disaster shelter but culturally, this is not considered for female. The limited mobility of disabled female also hinders them to take proper disaster preparedness. Majority of the female respondents did not receive disaster preparedness trainings, even the percentage female respondents (33.3%) received training was lower than male respondents (44.4%). Female respondents also have limited access to information technology (mobile phone) as identified through questionnaire survey and KII.

Access to education for the PWDs is rare in the country. This is because of inadequate infrastructures, lack of appropriate training among the instructors, insufficient teaching-learning materials and above all lack of supportive devices for both communications and mobility (Ali, 2014). On contrary, education levels determine the level of disaster preparedness (Cvetković, 2016). Unfortunately, majority of the specialized education centers are situated in urban area. As a result, we found all the respondents within the category of blind, dumb and multidimensional disabilities were illiterate (Table 1) and unemployed. They were not well aware about their rights. The study identified that majority of the respondents (82%) (Table 2) did not receive need-based allowances from any government departments or non-government organizations even after disasters. As a result, they are slower to recover from disasters (Stough, Sharp, Resch, Decker, & Wilker, 2016).

Higher incidence of disability is positively correlated with unemployment and illiteracy (Ali, 2014). Majority of the PWDs are not mainstreamed in the country's employment sectors, even though they possess some special skills (e.g. tailoring, handlooms, handcrafts). Although 81.3% of the respondents were within the economically productive age group (20–50 years), only 34% of the total respondents were engaged in different marginal occupations, including tailoring, bamboo basket making, gold smith, cooking, carpenter (making decorative part of wooden furniture), and organize indoor gambling game (carrom board game). The majority of the unemployed people (64%) failed to benefit from an income (Table 1).

Inaccessible health care facilities along with unfriendly health professionals often prevent disabled people to receive same level of services as the people who do not have disability (Paudel, Dariang, Keeling, & Mehata, 2016). Health care expenses for the PWDs are a financial catastrophe (Tareque, Begum, & Saito, 2014) for a family and access to specialized medical services for disabled people is very restricted in Bangladesh. Moreover, skilled medical professionals for disabled people are also limited in the country. There was no specialized doctor (government and private service centers) for disabled people in the study areas as identified through key informant's interviews. Majority of the respondents either go to quack doctors for health services and very few of them visit to general practitioners. Improper infrastructures and inadequate rehabilitations services impedes them to acquire proper medical treatment even after disasters or during disasters.

Physical accessibility to the disaster shelters is also very important part of disaster management. Simultaneously, evacuation plays a crucial role in

planning and operations of disaster relief (Apte, Heath, Pico, & Tan, 2015). The UNISDR 2013 Survey on "Living with Disabilities and Disasters" found that only 20.6% of the respondents could evacuate immediately without any difficulty in the event of a sudden hazard, while 73.1% of the respondents could evacuate with some degree of difficulty and the remainder (6.3%) reported that they will not be able to evacuate at all (Stough & Kang, 2015; UNISDR, 2014). In this study, we also found 66.7% of the respondents needed support from family members or others to reach in disaster shelters and 22% of the respondents never received any support to reach shelters. The blind, physically disabled and multi-dimensional disabled people require assistance from others to reach in disaster shelters. They also need adequate early warning and lead time before the disaster strike (Alexander, 2015). Majority of the respondents had the knowledge on nearest disaster shelters and they sheltered in those places during disasters (Table 2), but they were not satisfied about the disaster shelters in terms of locations, physical accessibility and disabled unfriendly sanitation systems. Some of the respondents (22%) (Table 2) were living within a kilometer far from a shelter and the rest within 1 to 4 kilometers. Shelters were not disabled friendly as two-third of the shelters had no ramp or any special arrangement in the lavatory for the disabled people. It is noted that many school buildings and union council (union council is the lowest local government unit of Bangladesh) buildings are also used as shelters in Bangladesh which are not disabled friendly. In spite of those limitations, respondents took shelter in those disaster shelters. They coped up with those adverse situations and described their miseries to natural disasters as will of God.

A disability status gives challenges but, for some, also opportunities that he or she would not have got without being disabled (Eide & Ingstad, 2013). In our study area we found respondents were very optimistic. One of the respondents mentioned that: "Disability is not a curse, almost every year face disaster, but we can easily overcome this if we have strong willpower and support from government and non-government organizations".

This was an empirical study on identifying coping strategies developed by the disabled people of southern coastal zone of Bangladesh. There are several limitations of this study that need to be considered to interpret the results. This study considered PWDs who were physically challenged, blind, deaf, and speech disorder only from three coastal sub-districts in rural context. There are some other causes of disability that were not taken into consideration in this study. The sample size of this study was also small. The results of the survey presented in a simple fashion. Moreover, disability can be seen in every village of the country. The coping mechanisms in disaster context were mostly focused on

some specific issues that were analyzed above, we did not consider food insecurity, gender-based challenges, poverty, empowerment and other psycho-social aspects in this study. Further studies could investigate how complex emergencies affect PWDs disproportionately using more quantitative techniques.

## Conclusion

Although disabled people are not mainstreamed in our society, we cannot exclude them from the development. This study advocates that government and non-government organizations should come forward to create disabled friendly environment so that they can cope up with disasters. Apart from the disabled friendly policy and planning, we also need rigorous monitoring at implementation of those policies. Failure to address the need of disabled people will significantly increase their vulnerability to disasters. On the other hand, engaging disabled people in decision making processes is somehow a difficult and slow process in the country. Government (e.g. Ministry of Social Welfare) and several development organizations (e.g. Action on Disability and Development-Bangladesh, Handicap International, Centre for Disability in Development) are working to empower disabled people and engage them in disaster risk reduction planning processes under the umbrella of different programs. The success and sustainability of this bottom-up approach is far reaching to address the 2030 Global Agenda for Sustainable Development and Sendai Framework for Disaster Risk Reduction 2015–2030. There are few empirical peer-reviewed literatures addressing the impact of disaster on disabled people in Bangladesh. This study might be particularly helpful for the policymakers and development practitioners to formulate disabled people friendly policies and programs.

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