



Accessibility Situation of Persons with Disabilities in the Southeastern Coast of Bangladesh in Relation to Climate Change and Disaster Management

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ABSTRACT

The research attempts to explore the accessibility and contemporary situation of Persons with Disabilities (PWDs) in the Eastern Coastal belt of Bangladesh in relation to climate change and disaster management. The study was conducted with a household survey of 206 PWDs from the Southern Coast of Bangladesh. Inaccessible conditions were existing at home and homestead areas of PWDs in the whole study area. The overall findings of the report identify a lot of big gaps or undesired conditions about the accessibility of disabling peoples in the study area. At this point of views, the researchers suggested for Enumeration of Disabling Peoples, Establishment of Rights & Protection of Persons with Disabilities Act 2013, Setup 'Accessible Spot Point' in rural area, Strengthening of warning system Establishment of 'Building Code', PWDs friendly shelter centre and Strengthening of Organization of Persons with Disabilities (DPOs) for effective disaster management strategy development to PWDS in Bangladesh.

Keywords: Persons with Disabilities, Southern Coast of Bangladesh, cyclone shelters

INTRODUCTION

Climate change is amongst the most dreaded problems in the new millennium. The effects of climate change can be seen all over the world. One of the most serious consequences of climate change is that people are being forced to leave their homes, lands and livelihood because they have been destroyed by the effects of climate change. These processes stand to displace many tens of millions of people in coming years. The coast of Bangladesh is prone to severe natural disasters, such as cyclones, storm surges and floods in combination with other natural and man-made hazards, such as erosion, the high arsenic contents of groundwater, saline water intrusion, waterlogging, water and soil salinity these disasters have made coastal dwellers very vulnerable and made the whole coastal and marine environment threatened (Barua et al., 2016; Barua & Rahman, 2018; Islam, 2004). Coastal areas constitute about 2.5 million hectares which amount to about 25 percent of the total cropland of the country, nearly 0.84 million hectares are affected by varying intensities of salinity, resulting in very poor land utilization (Barua & Rahman, 2017; Barua et al., 2017; Barua & Rahman, 2018; Barua & Rahman, 2019).

A person with a disability (PwDs) is a person having a physical, intellectual, sensory or mental impairment which substantially limits one or more of the major life activities of that person. More than a billion people currently live with some form of disability. This makeup about 15 percent of the world population or about one in seven persons. Eighty percent of these live in developing countries. They usually belong to the poorest populations, because disabilities are closely bound up with poverty. An estimated one in five of the poorest people worldwide live with disabilities (WHO, 2011). Bangladesh, the world's most densely populated country is also environmentally one of the most vulnerable regions due to its geographical and spatial location (MOEF, 2002). In Bangladesh, the total population is 159.6 million and more than 9.1% of the total population have been suffering from various types of disabilities (BBS, 2011). Bangladesh is ranked as one of the world's most disaster-prone countries, with 97.1 percent of its land area and 97.7 percent of its population at risk of multiple hazards. In addition to the risk of loss of life, victims of natural disasters face reduced food intake, reduced levels of sanitation and hygiene, limited access to health care and withdrawal of children from school for labour and accelerated national poverty line. Poverty has a strong disability dimension. One in five people living on less than US\$2 a day has a disability.

Climate change has become one of the biggest political and development issues in recent years. It has been well established that poor people are more vulnerable to climate change due to transient and/or marginal living and working environments; a reliance on climate-sensitive sectors; combined with limited

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assets and social security. The United Nations Office for the High Commission on Human Rights (UNOHCHR) has noted that climate change poses a direct threat to a wide range of universally recognized human rights. Globally, persons with disabilities remain amongst those most likely to have their human rights abused, challenged, unrealized or violated. The most recent UN human rights treaty, the UN Convention on the Rights of Persons with Disabilities, seeks to redress systemic human rights violations and social exclusion that are commonly encountered by persons with disabilities.

Persons with disabilities face unique challenges during every stage of emergency and disaster management due to inaccessible warnings, evacuation, response (including shelters, camps, and food distribution), and long-term recovery efforts. Additionally, disruption to physical, social, economic, and environmental networks and support systems affect people with disabilities in greater proportions. Common experiences reveal that people with disabilities are more likely to be left behind or abandoned during an evacuation in disasters and conflicts. They may be separated from their family members and caregivers, as well as their assistive devices (e.g. wheelchairs, prosthetics) or may be unable to operate them in a disaster (e.g. aids that run on electricity or batteries). Shelters and relief camps are frequently inaccessible to persons with disabilities, and they may be unable to easily access food and water distribution centres. The paucity of statistical data on persons with disabilities and limited knowledge on how to respond to their needs is another factor that heightens their vulnerability in a disaster or emergency (Molla et al., 2019; Smith et al., 2012).

Bangladesh is the worst disaster-prone country in the world and more than 28% of people in coastal areas, as well as whole country people, is vulnerable to climate change and other related disasters. Unfortunately, no research work or information was found about persons with disabilities involvement with disaster management program in Bangladesh. Alternatively, Persons with disabilities face unique challenges during every stage of emergency and disaster management due to inaccessible warnings, evacuation, response (including shelters, camps, and food distribution), and long-term recovery efforts. Pre-existing inequities may constrain their ability to access aid, acute trauma care, and relief services compounding their vulnerability during a disaster. In many cases, a vicious cycle is set in motion as persons with existing disabilities or those who acquire disabilities in a disaster face greater inequities during recovery and reconstruction due to challenges in re-integrating into the workforce, finding accessible housing, getting access to health and social services, and increasing dependency due to inaccessible infrastructure (Raja et al., 2013). The ultimate objective of the study is to investigate the accessibility and contemporary situation of PwDs in the southeastern coastal belt of Bangladesh priorities on climate change and disaster management.

METHOD

To formulate the methodological framework of this project work, primary field and secondary (literature) survey was done. The primary field survey has been collected two types of data,

i.e. qualitative and quantitative. Qualitative data were collected through Participant Observation (PO), Key Informant Interview (KII), Focus Group Discussion (FGD) and photography methods. Quantitative data were collected through a questionnaire survey. Emphasizing remarkable works related to climate change and PwDs in the eastern coastal belt of Bangladesh has given a clear concept about the research. Comparing the field and secondary level data were important to justify the reliability of both data of primary and secondary sources. The valuable suggestions from expert-level were very much helpful to give the direction for completing the report and to provide effective policy guidelines for ensuring sustainable adaptation to climate change and PwDs in considering the area.

Selection of the study area: The coastal region of Bangladesh is densely populated and about 28% of the population lives here and expected to increase from 36.8 million in 2001 to 43.9 million in 2015 and 60.8 million by 2050 (BBS 2011). It consists of 19 districts with an area of 47,201 sq. km which is about one-third of the total area of the country and 62 percent of the land of the coastal zone has an elevation of up to three meters and 86 percent up to five meters (MoWR, 1999b). The coastal area of Bangladesh is broadly divided into three regions such as; western, central and eastern region (Ali, 1999; Islam 2001). For conducting the present study southeastern coastal belt were selected. This coastal belt covered from Feni to Teknaf coastal areas (Figure 1).

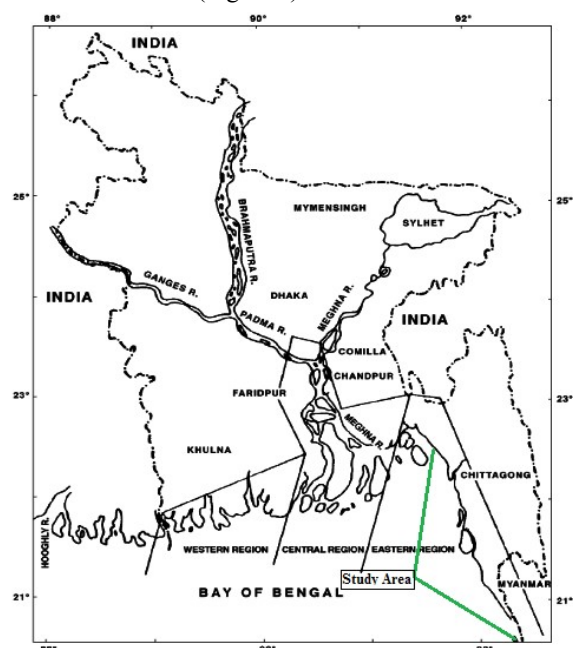


Figure 1. The study area South-Eastern Coast of Bangladesh

Data Collection

The research was conducted both qualitative as well as quantitative approaches. Qualitative and quantitative data were collected from two data sources, both primary and secondary. There are 5 Key Informant Interviews (KII) and 8 Focus Group discussion were conducted of South-Eastern coast of Bangladesh. Questionnaire survey method is very much popular for collecting numerical data of any socio-environment events in our society. Total 206 sample size has been conducted with PwDs from the study areas. Relevant secondary information

was collected about accessibility and contemporary situation of Persons with Disabilities (PwDs) and climate change with disaster management in the coastal belt of Bangladesh.

Data Processing and Analysis

After collections of data from all sources, both qualitative and quantitative data, primary and secondary were edited, coded, classified and tabulated the sequential manner. Quantitative data were interpreted with the help of two analyses statistical analysis and analytical analysis which was done by the help of statistical techniques, especially Statistical Package for The Social Science version-16 (SPSS-16) and various statistical tools such as tables, charts, graphs, diagrams, figures and photographs etc.

RESULTS

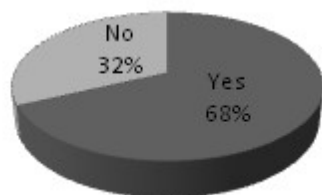
According to World Health Organization (WHO) statistics, there are over 400 million Persons with Disabilities in the Asia Pacific Region, (approximately two-thirds of the world's population of persons with disabilities), with 80 % of them live in rural areas of the region. Worldwide, 15% of the global populations, an estimated 1 billion people are living with a disability (World Health Organization (WHO), 2011. Besides, almost 14,482,000 peoples were disabling in Bangladesh (Hossain, 2015).

Information accessibility of PwDs about a natural disaster and climate change: Cyclone, floods, earthquake and anomalies of precipitation (drought and rain-flood) are the familiar or common disaster in the coastal area of Bangladesh. In the eastern coastal area is more susceptible to natural disaster not only for PwDs but also total livelihood in coastal areas of Bangladesh. The present survey found that nearly 68% of respondents or PwDs peoples were concerned about a natural disaster and 32% of respondents doesn't concern in the study area (Figure 2).

The cyclone warning system is the most essential works in pre and during disaster periods to attempts in coastal areas of Bangladesh. From the study, it is found that only 1.9% of respondents opined suitability of an existing cyclone warning system for PwDs. Besides, almost 64.1% and 32.5% of respondents were opined that partially and not suitable for an existing cyclone warning system for PwDs respectively in the study area (Table1).

During the disaster period, evacuation or rescue activities are the prime attempts for every volunteer group. Particularly, pregnant women, children, older persons and disabling peoples are priorities during the evacuation program. The proper

Figure 2 Knowing about natural disaster especially cyclone, flood, earthquake and drought



evacuation program can reduce the casualties and losses of lives and properties. From the survey, only 1.9% of respondents said

that suitability condition during cyclone disaster activities were suitable and 18% opined partially suitable for PwDs in the study area. But nearly 79% of respondents claimed that not suitable condition during cyclone disaster activities for Persons with Disabilities in the study area (Table 1).

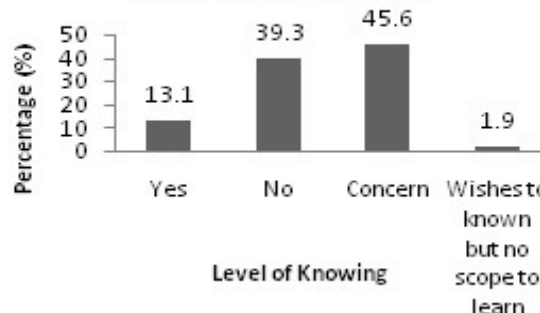
Table 1 Suitability rate of cyclone/disaster manager activities for PwDs

Suitability	Suitable	Partially Suitable	Not Suitable	Other
Existing cyclone warning system for PwDs	1.9	64.1	32.5	1.5
A condition during cyclone/disaster activities for PwDs	1.9	18	79.1	1
Post cyclone/disaster activities for PwDs	1.5	46.1	51.9	0.5

Post cyclone disaster activities are the management initiatives for the rehabilitation of victims in the coastal area of Bangladesh. In this time, persons with disabilities from the study only 1.5% of respondents said, the suitability of post-cyclone disaster activities for Persons with Disabilities were suitable and 46.1% opined partially suitable in the study area. However, nearly 52% of respondents claimed that suitability of post-cyclone disaster activities for Persons with Disabilities does not suitably (Table1).

The survey found that nearly 13% of respondents *knowing about climate change increase the natural disaster* and as well 39 % opined they don't know about climate change increase the natural disaster in the study area. It was significant that 45.6% of respondents claimed that they were concerned and 1.9% wishes to know, but no scope to learn about climate change increase the natural disaster (Figure 3).

Figure 3 Know about climate change increase the natural disaster

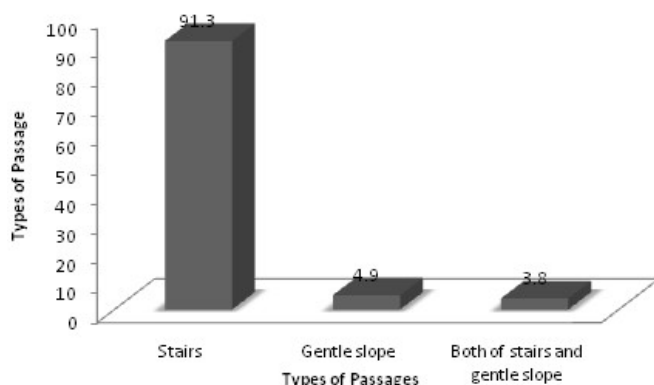


Cyclone shelter is the important structural measures at disaster-prone areas in Bangladesh. Entrance route is very much essential during a rescue period in the coastal area. Different types of shelter centre have been appearing in the coastal area of Bangladesh such as cyclone shelter centre, school and madrasah cum shelter centre and union Parishad cum shelter centre sometime Paurashava cum cyclone shelter centre. Types of passage are the most essential things in every shelter centre in the coastal area as build to safe for rescue people during the disaster period. Generally, shelter centre builds high land and the plinth of shelter centre keep high then adjoining topography for safe rescue peoples from an altitude of water level during the disaster period. Commonly, two types of passage appearing such as stairs and slope to entrance of shelter centre and among floors in the shelter centre. From the study, nearly 91.3% of

respondents said that stairs were the main passage to the entrance of the shelter centre. Simply 4.9% respondent's opined gentle slope and 3.8% respondents assumed both of stairs and gentle slope were the other passage to entrance of PwDs in shelter centre.

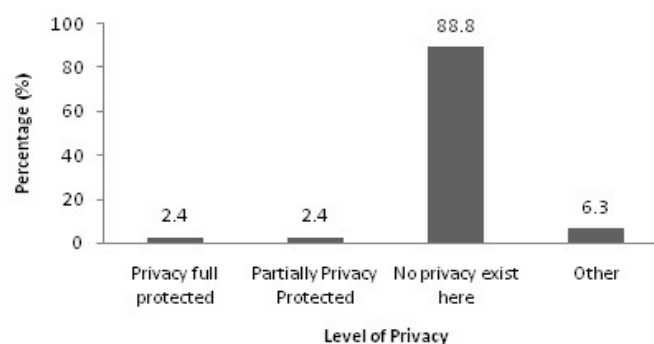
A small number of PwDs claimed that gentle a slope not only advantageous passage for disabling peoples but also it accelerated the smooth entrance of pregnant women and old rescue peoples by wheelchair. In the study area, maximum shelter centre or earliest installed shelter centre does not build in disabled-friendly because these shelter centre passages were only stairs but newly installed shelter centre keep gentle slope with stairs in the whole eastern coastal area (Figure 4).

Figure 4 Types of the passage to entrance of PwDs inside of shelter center



Women living in post-disaster situations are at daily risk of physical, emotional, economic and social harm in ways that have no direct parallels for their male counterparts (Davis & Bookey, 2011). While disability correlates with disadvantage, not all people with disabilities are equally disadvantaged. Women with disabilities experience the combined disadvantages associated with gender as well as disability (WHO, 2011). Evidence suggests that women are more likely than men to become disabled during their lives due to access to fewer resources, receiving less medical attention when ill and getting less preventative care and immunizations. From the study, it was found that approximately, 88.8% respondents said that no privacy exists noticed in shelter centre, but only 2.4% respondents opined that privacy was fully protected in the study area (Figure 5).

Figure 5 Women with disabilities privacy matters in shelter center



Although women privacy is the major concern for all, it was a big concern for Women with Disabilities privacy at every shelter centre in the whole coastal area. Because every type of

stakeholders was to keep shelter centre during the disaster period that time women privacy was too much essential at the shelter level in the study area.

Existing of primary health care facilities is the pre-condition for every rescue peoples those entrances in shelter centre during the disaster period. Health care facilities are essential for giving a primary treatment of rescue peoples, disaster injured peoples, pregnancy women, children and old peoples. Nearly 61.7% of respondents said that health care facilities were absent in the shelter centre and 33% of respondents opined health care facilities were partially facilitated in the shelter centre. Besides, only 1.9% of respondents argued that health care facilities were available in the study area.

Pure drinking water is the precondition for good health. Maximum respondents (47.6%) said that an insufficient supply of drinking water, 31.1% opined that does not supply of drinking water at the shelter centre. Besides, 18.9% of respondents argued that drinking water availability was average and 2.4% respondents expressed available in the study area. Drinking water availability was alarmed at the shelter centre in the study area. Persons with Disabilities peoples were claimed that tube well water was the major sources of drinking water at the shelter centres in the study area.

From the Focus Group Discussion (FGD)

It is found that 'Bangladesh National Building Code 2006' is fully violated during the installation of cyclone shelter centres and 'Cyclone Shelter Construction, Maintenance and Management Policy 2011' totally absent in cyclone shelter centre areas. FGD respondents claim that stairs are the only entrances route and way of moving from one floor to another. Gentle slope, lift system and emergency exit fully absent almost every shelter centre. The environment of shelter centre is unhygienic and bad conditions because unhygienic floor and toilet, inadequate of water supply and medicine and absent of register doctors. No health care facilities there and shelter dwellers are suffering from waterborne disease and foods. Shelter centre authorities do not arrange any types of disable friendly instruments such as a wheelchair, white cane, stretcher and crunch, etc. Personal privacy fully absent in shelter centre but it very much essential for women shelter dwellers. Sometimes temporary privacy manages by the hanging cloth even sometime dwellers quarrels with others for unwanted things. Although in Banskhali Upazila areas, gentle slope with stairs has been existing in few cyclone shelter centre those are built newly.

DISCUSSION

Bangladesh is the disaster-prone areas and inhabitants of the coastal areas of the country familiar with a frequent outbreak of natural disasters. So, the author found the maximum number of respondents (68%) concerned about the natural disasters which are common for the coastal area of Bangladesh. PwDs said that they were well concerned about the cyclone, flood, earthquake and drought in the study area. It was remarkable that few respondents claimed that cyclone and floods are the familiar disasters in coastal areas, but these disasters didn't hamper their daily livelihood.

Disaster management experts said that poor warning systems caused the severe damage to the environment and live and properties during the 1991 cyclone whereas better warning system has protected the lives and properties during cyclone SIDR in 2007 in the coastal area of Bangladesh (Barua et al.,

2017; Barua & Rahman, 2018; Barua et al., 2019). The cyclone warning system reduces not only the causality of coastal dwellers but also it helps to keep their valuable resources, take essential goods before going cyclone shelter centre and particularly rescue of pregnant women, children, old persons and persons with disabilities. From the study, it is recorded that only 1.9% of respondents opined the suitability of an existing cyclone warning system for Persons with Disabilities. Besides, almost 64.1% and 32.5% respondents opined that partially and not suitable for an existing cyclone warning system for PwDs respectively in the study area. A number of PwDs claimed that they resided in marginal or remote areas as a result cyclone warning signal or siren was not heard in proper time, alternatively sometimes inadequate miking, lack of proper dissemination and person to person communication media were the main backwardness for getting information about cyclone signal in the study area.

The authors found that only 1.9% of respondents said that suitability condition during cyclone disaster activities was suitable for the PwDs in the study areas. PwDs argued that during disaster non-disable people can save them from causalities but persons with disabilities too much fatalistic by nature and the assistances who rescue them. This survey reveals that the muddy entrance route was commonly appeared in the rural marginal areas, far distance from Upazila or Paurashava headquarters and near the coastal areas, their shelter centre were installed; semi-pucca entrance route seemed in village areas, these areas were connected with Upazila connected road and pucca entrance route were looked near to the national highways, Paurashava and Upazila connected road their shelter centre were installed. Investigators noticed an infrastructural nameplate, maximum shelter centres were installed after a nineteenth century and PwDs opined that after 1991 cyclone shelter centres were installed in the eastern coastal belt of Bangladesh.

Post cyclone disaster activities are the key approaches for rehabilitation of victims in the coastal area of Bangladesh. Ministry of Relief and Rehabilitation, armed force, donor agencies between national and international, political parties, local rich peoples, various governmental and non-governmental autonomous bodies provide relief and rehabilitation program by them meditate people in the post-disaster period. The authors found that only 1.5% of respondents stated that suitability of post-cyclone disaster activities for PwDs were suitable. As different types of inequalities explore from this survey, particularly less consideration of persons with disabilities during relief and rehabilitation program, relief providing personnel too much considered their relatives for getting relief, lack of good management of the relief program, no special options for providing relief for PwDs. Climate change-induced natural disaster increasing in Bangladesh and coastal people are suffering continuously by the cyclone, coastal erosion, flood, salinity intrusion problem. 45.6% of respondents claimed that they were concerned about the climate change-induced natural disasters increasing in the study areas.

Climate change is entirely impacting on life and livelihood of every people in Bangladesh, particularly negative impacts on the daily life of the Persons with Disabilities. Due to inaccessibility, persons with disabilities are facing different types of a natural disaster like cyclone, tornado and flood. She claimed that Persons with disabilities did not get a disaster forecasting signal based on their types of disabilities and they

did not go to the cyclone shelter centre due to inaccessibility. In Bangladesh, the accessibility of Persons with Disabilities is inaccessible. Although currently Persons with Disabilities are involved in 'National Disaster Management Committee' on behalf of the Government of the People's Republic of Bangladesh, they are deprived to get their rights during and post-disaster periods. Persons with Disabilities are too many vulnerable to climate change-induced disaster at any moment. For this reason, central planning and management department take proper initiatives for minimizing the effects of climate change. At the same time, about climate change-induced disasters, disaster signal system and provides training programs for the efficiency of Persons with Disabilities. It is mentionable that the present government takes proper initiatives and attempts to encounter any kind of disasters to save persons with disabilities.

LIMITATIONS

The authors surveyed the accessibility of PwDs on climate change-induced disaster management activities only on selected areas of South-Eastern coast of Bangladesh due to time limitation and funding unavailability. The authors try to start the household survey on same issue whole coastal area of Bangladesh in future.

CONCLUSIONS

In Bangladesh, there are about 14,482,716 persons with disabilities. Physicians, mandate from health officials and experts, a mandate from disabling health care and assistance centre concerning departments of national Disabilities Promote Foundation are provided eleven categories of disabling peoples in our society. It is a significant portion of the total population because disabling peoples are the special community in our family, community, society and country.

According to the Constitution of Bangladesh, all citizens of the country have the right to enjoy their dignity, fundamental human rights and have social equality. It does not give new rights to persons with disabilities. Yet, finding of the research report, inaccessible conditions exist in everywhere, particularly homestead areas, during road and transport riding, getting information about climate change and involve of disaster management related activities, short-term dwelling at disaster shelter centre, receiving health care from hospitals, local governmental level and bank and financial level accessibility for Persons with Disabilities in Bangladesh. Although, Bangladesh was signed and ratified the UN Convention on the Rights of Persons with Disabilities and adopted the Rights and Protection of Persons with Disability Act 2013. The aim of the Act 2013 was to create equal opportunities for Persons with Disabilities and their full participation in families, communities, and countries. The Rights of Persons with Disabilities are dissatisfied in every sector. Besides, the Government of the People's Republic of Bangladesh and her concerning department provided different laws, rules and regulations for smooth livelihood for every citizen in her territory. For, Example, Bangladesh National Building Code 2006 is a rule and it ensures the structural safety measures for all in every infrastructural level especially Persons with Disabilities. Moreover, Cyclone Shelter Construction, Maintenance and Management Policy 2011 having the safe dwelling at disaster or

cyclone shelter centre level. Research findings and experts claimed that considering laws, rules and regulation did not apply properly to the concerning department and also lack of good governance has been accelerating the applying procedures of these laws, rules and regulation at every level. To willing helping hands, ensuring apply of all concerning laws, rules and regulations, government and related NGOs providing (without paying) disabling peoples friendly instruments and financial assistance might be accessing their personal, social, community life.

RECOMMENDATIONS

The overall findings of the report identify a lot of big gaps or undesired conditions about the accessibility of disabling peoples in the study area. At this point of views, the researcher has tried to provide the following recommendations based on respondent's opinions, Key Informant opinions and Focus Group Discussion (FGD) along with researcher builds a few concepts which enrollment as understanding and introducing the 'Accessibility' term; Enumeration of Disabling Peoples; Establishment of Rights & Protection of Persons with Disabilities Act 2013; Setup 'Accessible Spot Point' in rural area; Strengthening of warning system Establishment of 'Building Code' and 'Infrastructural Rules and Regulations'; Keeping disabling friendly instruments at every institutional level; Ensure transport accessibilities; User-friendly shelter centre; Gear-up marginalized Disabling people; Health Care Accessibilities; Ensuring the Accessibilities from government and financial institution level and lastly Strengthening of Organization of Persons with Disabilities (DPOs).

REFERENCES

- Ali, A. (1999). Climate change impacts and adaptation assessment in Bangladesh. *Climate Research*, 12(2), 109-116.
- Barua, P., Shahjahan, M., & Simperingham, E. (2016). Climate displacement in Bangladesh: Legal and policy responses for rights-based solution. *Social Change*, 6(1), 85-100.
- Barua, P., & Rahman, S. H. (2017). Indigenous knowledge practices for climate change adaptation in the southern coast of Bangladesh. *IUP Journal of Knowledge Management*, 15(1), 45-55.
- Barua, P., & Rahman, S.R. (2017). Indigenous knowledge practices for adaptation of climate change in the southern coast of Bangladesh. *IUP Journal of Knowledge Management*, 15(1), 88-105.
- Barua, P., Rahman, S. H., & Molla, M. H. (2017). Sustainable adaptation for resolving climate displacement issues of south eastern islands in Bangladesh. *International Journal of Climate Change Strategies and Management*, 15(2), 60-80.
- Barua, P., & Rahman, S.H. (2018). Sustainable Adaptation of Vegetable Sectors in Relation of Climate Change and Disaster Management in South-Eastern Bangladesh. *IUP Journal of Supply Chain Management*, 20(3), 45-65.
- Barua, P., Rahman, S.H., & Molla, M.H. (2019). Impact of river erosion and coping strategies for climate displaced people in South-Eastern region of Bangladesh. *International Journal of Migration and Residential Mobility*, 2(3), 45-65.
- BBS. (2001). *Statistical yearbook of Bangladesh 2001*. Bangladesh Bureau of Statistics, Government of the People's Republic of Bangladesh, Dhaka, Bangladesh.
- BBS.(2011). *Statistical yearbook of Bangladesh 2011*. Bangladesh Bureau of Statistics. Statistics & Informatics Division (SID), Ministry of Planning, Government of the People's Republic of Bangladesh, Dhaka, Bangladesh.
- BBS. (2014). *Statistical year book of Bangladesh 2014*. Bangladesh Bureau of Statistics. Statistics & Informatics Division (SID), Ministry of Planning, Government of the People's Republic of Bangladesh, Dhaka, Bangladesh.
- Barua, P., & Rahman, S. H. (2018). Community-based rehabilitation attempt for sustainable solution of climate displacement crisis in coastal Bangladesh. *International Journal of Migration and Residential Mobility*, 1(4), 45-60.
- Barua, P., & Rahman, S. H. (2019). Sustainable value chain approach for vegetables products in responses to climate change adaptation. *IUP Journal of Supply Chain Management*, 19(1), 20-45.
- MoDMR. (2012). Cyclone shelter construction, maintenance and management policy 2011. Ministry of Disaster Management and Relief Bangladesh, Government of the People's Republic of Bangladesh, Dhaka, Bangladesh.
- MOEF. (2002). *Initial national communication under the United Nations framework convention on climate change*. Ministry of Environment and Forests (MoEF), Government of the People's Republic of Bangladesh, Dhaka, Bangladesh.
- MoEF. (2009). Bangladesh climate changes strategies and action plan 2009. Ministry of Environment and Forests, Government of the People's Republic of Bangladesh, Dhaka, Bangladesh.
- MoWR. (2005). *Bangladesh coastal zone policy*, Ministry of Water Resources, Government of the People's Republic of Bangladesh, Dhaka, Bangladesh.
- Raja, S., Imaizumi, S., Kelly, T., Narimatsu, J., & Paradi, G. C. (2013). How information and communication technologies could help expand employment opportunities. *Society*, 25(5), 30-50.
- Smith, F., Jolley, E., & Schmidt, E. (2012). Disability and disasters: The importance of an inclusive approach to vulnerability and social capital. *Journal of Social Change*, 20(2), 50-70.
- WHO. (2011). World report on disability 2011. World Health Organization. Rome, Italy.

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