

# THE AFTERMATH OF NATURAL DISASTERS IN BANGLADESH AND A PROPOSAL TO MINIMISE CASUALTY

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## **Abstract**

*Bangladesh is a low-lying country located in the southern foothills of the Himalayas, and is prone to global climate change, heavy precipitation, urbanization, man-made environment unfriendly alterations, etc. Consequently, every year, the country faces different types of natural disasters like flood, cyclone, drought, and river erosion. The objective of this paper is to study the occurrence and impact of the natural disasters, and to initiate appropriate remedies for the vulnerable groups. Data from the Centre for Research on the Epidemiology of Disasters (CREED) is used for accomplishing the purpose of this paper. The various natural disasters that occurred in the past 10 years (2010-2019) and the population that was affected during the disasters, especially the vulnerable group - children, women, and aged persons, are given dedicated focus. Data from the Bangladesh Bureau of Statistics (BBS) is used to ensure that the people considered for the study had spent most of their lives at households in Bangladesh. Data from the United Nations World Population Prospects 2019, the World Bank, and IBRD-IDA were analyzed for observing the population structure of Bangladesh. A few published web reports, scientific articles, and relevant literature have been sourced to fetch representations for various graphical charts. It is observed that, amongst all the natural disasters, maximum damage to the population has been caused by flood (69%) and storm (30%) which occur frequently every year compared to other natural disasters. In the population pyramid of Bangladesh, the male and female ratio of the active and in-active population (children, aged people etc.) is almost same. This indicated that the vulnerable group are at risk during natural disasters. With its findings and proposals, this paper strives to supplement the government preparedness program for pre and post natural disaster, and minimize health hazards.*

## **Keywords:**

*Natural Disaster, Gender, Geographical Feature, Population*

## **1. INTRODUCTION**

Environmental natural disasters cause colossal loss of lives, displacements, and damages to infrastructure. From 1990 to 1998, 97% of the total deaths related to natural disasters occurred in developing countries [1]. There is growing evidence that degradation of the environment will intensify the long-term climate change and extreme weather. Rich industrialized nations emit most of the carbon responsible for climate change, but low-income countries will suffer most from the impacts of climate change.

The topography of the country, geographical position and climate changes over time cause natural disasters to be regular phenomena in Bangladesh. The social and economic activities of Delta communities are often affected by disasters, which are the most vulnerable regions of the country. The greatest devastation is often in the form of dynamic erosion and accretion in communities living in riverine island areas. These regions are known for their numerous natural and social hazards. They are

known as cars. For example, carpenters lose significant amounts of usable land every year because of continuous erosion on the banks of the river. Apart from natural hazards, charity lives are hampered by poor communication structures that limit the equal access of care dwellers to the social and economic benefits of continental residents. The many charitable regions of Bangladesh, which forms around 5% of the total area of the Nation (7,200 km<sup>2</sup>) and of the population (6.5 million people), face these challenging conditions. The fact that in these regions people are often unable to migrate and find jobs on the mainland is just as challenging.

Climate change could result in the decline of agricultural production in many tropical and sub-tropical areas that already face food deficits, and could displace millions of people, decrease water availability and increase the spread of diseases such as Diarrhea, Malaria etc. More than 90% of all deaths caused by natural disasters were from droughts, floods and windstorms [2]. In 1999, the US reported twice to thrice the number of disasters that happened in Bangladesh. Yet, in Bangladesh disasters caused 34 times more deaths than the US [3].

Agrochemical use affects 25 million agricultural workers each year and kills hundreds of thousands [4]. Global climate change is predicted to increase the risk of flooding in Bangladesh by 20% affecting especially poor people that currently live in flood plains [5]. Developing countries in semi-arid zone are speculated to be particularly hard hit by reduced water availability resulting from global climate change [6]. The average cost of natural disasters as a percentage of the GDP is 20% higher in low-income countries than in rich industrialized countries [7].

In our society, women and children are the most vulnerable group during disaster. Women are more likely to die than men after a large-scale disaster. Neumayer and Plümper analyzed disasters in 141 countries and found that, when it came to deaths, gender differences were directly linked to women's economic and social rights. They also confirmed that discrepancies were the result of existing inequalities.

For example, boys were given preferential treatment during rescue efforts and, following disasters, both women and girls suffered more from shortages of food and economic resources [8]. Studies show that women, boys and girls are 14 times more likely than men to die during a disaster [9].

Females are a more vulnerable group in a disastrous situation and should be looked after. Initiatives for this vulnerable group should be taken so that they can deal more efficiently with the disaster. Now-a-days in our country there are not only natural disasters but also many man-made disasters such as water pollution, road accidents, devastating fire etc. Given that women make up half of the total population, their threats in a disastrous situation cannot be minimized. In all of these disasters, a developing country like ours where women are not considered as equally important as men, has many problems in managing their

risks. Women in Bangladesh are still experiencing various types of physical, sexual, emotional and domestic violence (abusive language or physical force exertion), which rises during and after a disaster [16].

Over the past decade, there has been an influx of new ideas and solutions in the Bangladesh disaster management market. Over the past few years, the GoB has taken a number of important steps to develop institutional arrangements from national to union level for efficient and systemic disaster management that promote mitigation of the suffering of Bangladesh's disaster victims. The GoB has devised a set of structures for councils and committees from the national to the grass-root levels to maintain proper coordination among the ministries, departments, line agencies, local government agencies and community people concerned, and also to ensure their proper functioning to alleviate people's sufferings.

The Standing Orders on Disaster (SOD) serve as a guidebook (www.adrc.asia) to make the processes best operational. Major approaches have shifted from technology-based hazard control to community-based disaster risk management, aimed at reducing human vulnerability and building community resilience. Inside each union, disaster management committees are formed for this reason. The Committee prepares a plan and maps for emergency action, indicating danger hazards and the resources available in the Union. Community members engage in this cycle, using PRA methods. It is the responsibility of the committee to disseminate warning signals, perform evacuation, search and rescue, distribute relief and run shelter centers on the basis of the disaster response plan. Community-based approach (CBA) which emphasizes the total participation of all persons facing any danger or disaster and ensures that all necessary services are provided to the community. The new disaster management system in the country includes operations at normal times for important aspects of disaster management, such as mitigation or prevention, preparedness, response and recovery [16].

In 1991, during the cyclone disasters in Bangladesh, of the 140,000 people who died, 90% were women [10]. During the emergency caused by hurricane Katrina in the United States, most of the victims trapped in New Orleans were Afro-American women with their children [11] [12]. In Sri Lanka, it was easier for men to survive during the tsunami because knowing how to swim and climb trees is mainly taught to boys. This social discrimination means that girls and women in Sri Lanka have very few possibilities of surviving in future disasters [13].

Nutritional condition determines the capacity to deal with disasters [14]. Women are more likely to suffer from malnutrition because they have specific nutritional needs when they are pregnant or breast feeding, and some cultures have food hierarchies. For example, in south and south-east Asia, 45%-60% of women of reproductive age are below their normal weight and 80% of pregnant women have iron deficiencies.

In sub-Saharan Africa women lift much heavier loads than men but consume fewer calories because the culture rules that men receive more food [15]. Extreme weather events often create conditions conducive to outbreaks of infectious diseases; heavy rains produce insect breeding grounds, and contaminate clean water sources while drought on the other hand can cause fungal spores and spark fires.

The gender differences are the most telling in the aftermath of a disaster, as in most cases, the mortality rates for women are higher than those of men. For example, women died in significantly larger numbers in the 1991 Bangladesh cyclone, the 1993 Maharashtra earthquake [13], the 1995 Kobe earthquake [17], as well as the 2004 Indian Ocean tsunami in Indonesia, India and Sri Lanka [8].

Specifically, women accounted for 90% of the 1.4 lakh people killed in Bangladesh in the 1991 cyclone disaster, 61% of the deaths in Cyclone Nargis in Myanmar, 55-70% of Banda Aceh tsunami deaths, including in Kuala Cangkooy, which was one of the worst affected districts in the North Aceh, Indonesia, with an 80% female fatality rate [14]. There are many likely reasons for the higher mortality rates for women during disasters, such as:

- (a) The physical limitations of women, including the inability to climb trees and/or the inability to swim,
- (b) The need to protect other vulnerable family members such as children and elderly, and
- (c) The livelihood patterns and the time of occurrence of the disasters.

This note focuses on four factors that put women at a particular risk during natural disasters and have implications for how natural disaster risk management programs are to be designed and carried out. These factors include:

- i) Vulnerability;
- ii) Livelihoods;
- iii) Education and participation; and
- iv) Land titling and inheritance rights.

This paper will be helpful in reducing few gaps under the government preparedness program for pre and post natural disaster and effective for ease health hazard.

## 2. OBJECTIVE OF THE STUDY

- To observe the natural disaster situation and its vulnerability between the years 2000 and 2019;
- To find out the most vulnerable group (including women) during natural disaster;
- To find out the most vulnerable group (including women) specific adaptation needs at a micro-scale during natural disaster; and
- To identify barriers in implementing perceived adaptation measures and to recommend ways and means to overcome the barriers.

## 3. METHODOLOGY

Data from the Centre for Research on the Epidemiology of Disasters (CRED) used for accomplishing the purpose of this paper. The various natural disasters that occurred in the past 10 years (2010-2019) and the population that was affected during the disasters, especially the vulnerable group - children, woman, and aged person, were given dedicated focus. Data from the Bangladesh Bureau of Statistics (BBS) was used to ensure that the people considered for the study had spent most of their lives at households in Bangladesh.

Data from The United Nations World Population Prospects 2019, the World Bank, and IBRD-IDA were analyzed for observing the population structure of Bangladesh. A few published web reports, scientific articles, and relevant literature have been sourced to fetch representations for various graphical charts.

#### 4. RESULTS AND DISCUSSIONS

Bangladesh is one of the over-populated countries in the world where her population density is 1015 per km<sup>2</sup> [4]. This disproportionate population has impacted the environment due to survival needs. Across the world, approximately 218 million people were affected by natural disasters on an average per annum between the years 1994 and 2013 as in Fig.1. It is observed that all age group population for male and female is almost same in population age pyramid.

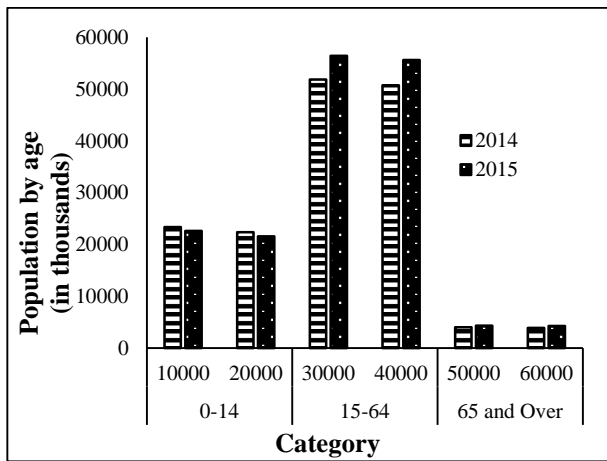


Fig.1. Population Structure in Bangladesh during 2000-2020 periods

#### 4.1 NATURAL DISASTER SITUATION IN BANGLADESH

Table.1. Natural Disaster Situations in Different Continents in 2019

Year	Affected Population Numbers		
	Flood Affected population	Landslide Affected population	Strom Affected population
2010	575000	55230	257160
2015	1411901	1003	2660250
2017	8086025	80187	3300012
2019	4000000	18016	10045

It is understood (Table.1) that, due to its geographical features and its excessive population that impact climate change, the continent Asia faced more natural disasters compared to other continents in 2019. The statistics reveal that Asia suffered 38% (150 out of 390) natural disasters that affected 74% (68,347 thousand affected populations out of 92,811) of the affected

population causing 51% (US\$ 61 billion out of 120) economic damage.

#### 4.2 DISASTER SITUATION IN DIFFERENT CONTINENTS

As per Fig.3 it is observed that of all the natural disasters flood 69% (14,072,926 out of 20,454,829) and storm 30% (6,227,467 out of 20,454,829) are the major forces that affect the population. Flood ravages Bangladesh almost every year.

The male-female sex ratio of the population of Bangladesh is almost same implying that the male and female ratio of the active and in-active population (children, aged people etc.) is also almost the same. This indicates that the vulnerable group (<14 years age and >65 years age groups) are at risk during natural disasters along with the female population across all categories. Thus, it is clearly realized that the women, children, and the aged people are the ones who are at risk during natural disaster.

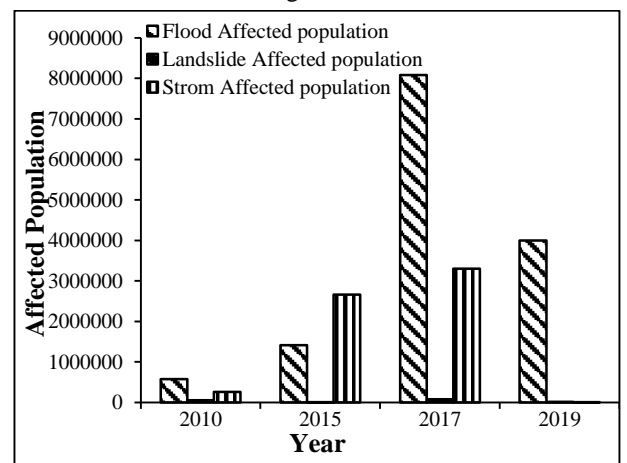


Fig.3. Natural Disaster Situation in Bangladesh 2010-2019

#### 5. CONCLUSION

It is not possible to control natural disaster. But it is possible to control the devastation of natural disaster by initiating necessary measures. We need to focus on the awareness and the preparedness program through training, campaign, and media (TV, radio, newspaper, Facebook, LinkedIn etc.) so that the people of the disaster-prone area can take proper initiatives before and after the disaster to avoid waterborne diseases. In case of afforestation and planning urbanization, building code should be strictly followed. More shelters have to be created in disaster belt areas. Most importantly, special attention has to be paid to women, children, aged population, and animals during natural disaster.

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