

## Necessity of Resilience Practices to Reduce Flood Vulnerability at Community Level in Bangladesh

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**Abstract:** The geo-physical contexts of different areas of Bangladesh are diverse and distinctive from location to location. Each of the area has distinct characteristics and own livelihoods pattern. The recent climate change has made different communities of Bangladesh vulnerable to frequent disasters. The impacts of climate change have also been visible at the river-adjacent communities which are being resulted through the losses by disasters and making the communities socially, economically and culturally vulnerable. Enhancing community resilience is very important to make any community capable to cope with climate change. If the community people achieve resilience capacity and have a coping mechanism, then they can come back in their usual situation by very short period after any type of disaster like flood and can minimize losses by other supporting tools that they achieve through the silencer. The *Hudir Bazar* is a flood-prone community situated in Lalmonirhat district of northern Bangladesh on the bank of Teesta<sup>1</sup> River. Most of the community people are marginalized; and agriculture and day-laboring are the main means of their livelihoods. Almost every year, flood occurs and causes tremendous losses to their property and livelihoods. The tendency of floods has increased in last few years as anthropogenic climate change introduced in Himalaya region<sup>2</sup>. For this, Teesta River and its adjacent communities are the sufferers of this impact. The study was conducted on participatory observation approach using both qualitative and quantitative research perspectives. The study identified the losses resulted from flood vulnerability and its impacts on community people's livelihoods. The study suggested importance on enhancing resilience techniques which will contribute to reduce losses at community level to make the community people more resilient to disasters specially to the flood vulnerability.

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<sup>1</sup> Teesta River is a 315 km (196 mi) long river that rises in the eastern Himalayas, flows through the Indian states of West Bengal and Sikkim through Bangladesh and enters the Bay of Bengal. It drains an area of 12,540 km<sup>2</sup> (4,840 sq mi). It forms the border between Sikkim and West Bengal. It joins the Jamuna River in Bangladesh

<sup>2</sup> The Himalayas or Himalaya is a mountain range in Asia, separating the plains of the Indian subcontinent from the Tibetan Plateau. The range has many of Earth's highest peaks, including the highest, Mount Everest.

### 1. Introduction and Background

Bangladesh is a densely populated and disaster-prone country in South Asia, bordering Myanmar, India, Nepal and Bhutan. The surface area in Bangladesh is currently at 147,570 km<sup>2</sup> (or 56,977 square miles). The country has estimated 2019 population of 163.05 million. (World Population Review 2019). Due to geo-graphical location and recent impacts of climate change, the country has continuously been facing natural disasters like flood, land slide, cyclones, nor'wester and salinity intrusion which can be treated as the extreme events. Though the disasters are happening as the natural phenomenon, but it can't be ignored that these are the direct results of climate change to increase the number of extreme events in Bangladesh. The country has lost its many rivers and the characteristics of major delta of the rivers are frequently changing every year. Beside this, seasonal variation and rain pattern has

changed. Due to heavy rains and upstream water coming from Nepal, India and even China in monsoon and dry season; every year the country experiences flood. As an impact of climate change; flood has become a common disaster of Bangladesh. Since 1972 the country has experienced many natural disasters. Of them flood which represents and one-third respectively of the total disasters. Each year Bangladesh has been experiencing the disaster flood and since the inception of the country (Natural Disasters and Management Systems of Bangladesh from 1972 to 2017: Special Focus on Flood). On the global flood affected country ranking Bangladesh is the second highest flood affected populated country. Flood is a recurrent natural phenomenon occurring every year in Bangladesh. Destructive floods are one of the main barriers for economic development and planning in Bangladesh; in other words, extreme floods, which appear frequently, are one of the most

serious handicaps in this riverine country (Ozaki M., Disaster Risk Financing in Bangladesh, 2016).

The northern Bangladesh is situated in Teesta, Dharla<sup>3</sup> and Brahmaputra<sup>4</sup> River basin along with other 30 rivers, where community people face flood every year. Normally, the flood affected areas are inundated for about one to two weeks. But the impacts of flood are severe which cause damage to the crops, properties and livelihoods and stops daily working opportunity, inundates agricultural lands, make people shelter less, spread various types of diseases and vanish all the stocks that people attain round the year. The community need a long time to recover from the loss of flood and they must bear the cost of flood round the year. In 2017, Bangladesh faced mega flood for two times. In 2019, monsoon and late flood also affected the country's northern sides and other parts heavily. Both floods had devastating impacts on the community people and their properties.

## **1.2 Rationale of the study**

Though the capacity of community people in Bangladesh has developed on adaptation to climate change but if the extreme events like floods continue happening years after years then it will surely hinder the development of country. So, initiatives to tackle climate change should be taken not only from adaptation point of view but also by increasing the community resilience. Building resilience to climate change is the capacity of social, economic and environmental systems to cope with a hazardous event, trend or disturbance, responding or reorganizing in ways that maintain their essential function, identity and structure, while also maintaining the capacity for adaptation, learning and transformation (IFRC Framework for Community Resilience, 2014). Bangladesh has developed climate change strategies, strengthened institutional arrangements and allocated budget to address climate change. These strategies and policy decisions reflect some impacts and further attention to be comprehensive specially the resilience program is needed. A resilient community is socially connected and can withstand disaster and foster community recovery. The community can take collective action after an adverse event that reduce the impact of major disturbances and help protect people. Resilient communities promote individual and community physical, behavioral, and social health to strengthen their communities for daily, as well as extreme, challenges.

## **1.3 Study area profile and research objectives**

<sup>3</sup> The Dharla River is one of Bangladesh's trans-boundary rivers. It originates in the Himalayas

<sup>4</sup> The Brahmaputra is a trans-boundary river which flows through China, India and Bangladesh.

The study was conducted at Hudir Bazar Community of Lalmonirhat District of northern Bangladesh. The community is located at Rajpur Union<sup>5</sup> which is 13 kilometers far to South from Lalmonirhat district Sadar. The community is located at the edge of Teesta river. The community people are experienced with flood and river erosion since long many years. For tackling river erosion, an embankment of stone was made at the south part of the community at the edge of Teesta River before 16 years ago. Then the community was rescued from river erosion. About 466 households were living at the community and the total population was 2,026 including 987 males and 1,039 females. It was found that around half of the total population had no formal education. Most of the respondents who were educated had primary education. Very few of the people had higher education. The socio-economic condition was responsible for less education rate in the community. Poverty and socio-economic factors pushed the male members of the community to earn from very early age of life. For this reason, community people's opportunity to acquire education became narrow. Day laboring was the main occupation of most the household heads of the community. Agriculture and business were the main occupation of some household heads but not at greater scale. Hence, most of the community peoples' occupation was river-centric and they had limited opportunities to other livelihood options. But in a specific period of the year, they could cultivate different types of crops at river. The Teesta usually becomes full of water from June to October. The rest five months the river gets mostly dry. Then the community people can use the river soil for agricultural purposes. Beside this, they had different types of small business. Some of the household heads were found as non-govt. service holders and rickshaw/van pulling. Beside this, a few of the household heads were found as housewife, beggar, street retailer, floating businessmen, barber, electrician, blacksmith, worker at small cottage etc. It was found that some of the household's earning was dependent on fishing in the river, but it was not their profession. It was found that some of the development organizations were working at the community to improve the life and livelihoods of the community people considering the flood vulnerability and providing supports. Flood was the main disaster at this community.

The objectives of the study were:

<sup>5</sup> Union or Union Parishad is the smallest rural administrative and local government unit in Bangladesh.

- To identify community people's knowledge on climate change adaptation and resilience.
- To assess the impacts of flood on the community people's livelihoods and the types of actions are practiced by them to face flood.

To identify some resilience practices for the community people to reduce the flood vulnerability and achieve their capacity to stand with flood by minimizing losses in future.

## 2. Material and Methods

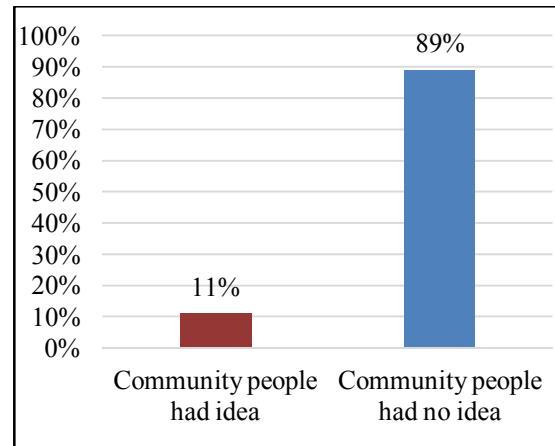
The study was conducted based on participatory observation approach by using both qualitative and quantitative perspectives. To understand the strength and ways of community resilience; different frameworks, research and policy papers, govt. reports, reports of different non-government organizations were reviewed. Data were collected from both primary and secondary sources. The primary source of data comprised of community census, face-to-face and in-depth interviews and case studies. Beside this, a minis survey was conducted for the study. The secondary data included of different national and international documents, policy papers, books and articles and peer-reviewed documents on climate change, vulnerability, adaptation, loss and damage and flood vulnerability and different documents of project that were implemented at this community by some development organizations.

## 3. Results and Discussion

### 3.1 Community people's perception on climate change and resilience

It was identified that flood was main disaster at this community since last 20 years. Flood used to occur almost every year at the community. Though river erosion, cold wave, storm and drought also affected the households of the community, but the impacts of flood were greater than the other disasters. It was found that very few people had the idea on the issues like on climate change, adaptation and resilience. Some of the respondents who had idea about climate change, resilience and disaster risk reduction they had got it from announcement, mobile and Television. Some of other respondents became familiar with these ideas by attending meeting and receiving training from NGOs, UP and reading newspaper. Beside these; some of the respondents knew about the concepts from cultural program, poster, leaflet, radio, teachers, Upazila<sup>6</sup>/District Parishad, signboard and billboard. Though most of community people did not had knowledge in this regard but they could understand that there became a

change in the climatic situation from last couple of years. They informed that there were seasonal variations and the disaster intensity had increased from last few years. The pattern of climate at community level changed and the characteristics of the seasons differed. For this, the duration of winter season become shorten and in rainy season heavy rains occur by very short time. But the community did get enough water for agricultural and livelihood purpose when they needed.



### 3.2 Impacts of flood

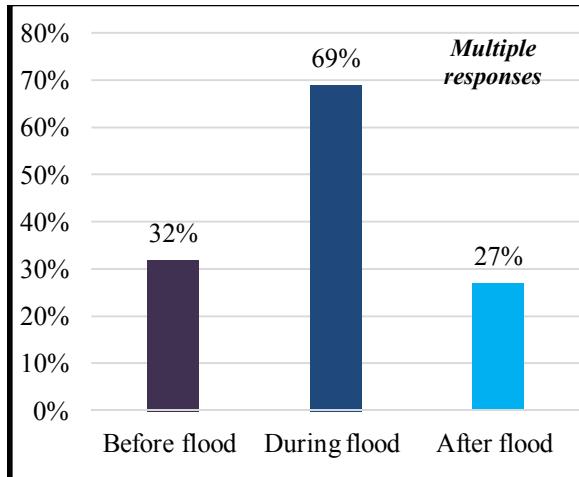
It was found that flood had adverse impacts on the community's live, livelihoods and at household level. Besides; it had also impacted on the crops, agricultural lands, domestic animals and other basic needs of community people like shelter, water, sanitation etc. Household's daily income was hampered and reduced, and the community people were bound to earn at a limited extent due to flood. Household's tube-wells and latrines were harmfully affected and living houses were damaged respectively. Beside these impacts; cooking problem/preparing foods, health complexity, livestock death (hen, duck etc.), skin diseases, destroy of seedling, damaging trees and vegetables, safe drinking water and hygiene management problem, damaging store and cattle houses, inundating tube-wells and latrines and problems in domestic cattle management were derived due to flood. Some of the community mentioned that, during the flood situation they and their household's members felt insecurity for various causes.

### 3.3 Actions by community people to floods

The community people usually took different types of actions before, during and after the flood. It was found that before flood they used to save money, preserve food, raise the household level, take information about the shelter center and raise the platform of tube-wells and latrines and inform community people to be prepared for facing flood.

<sup>6</sup> The Upazila is an administrative region in Bangladesh.

During the flood period; they shifted properties and materials at safer places, advised others to shift and take safe shelter, worked together to reduce the loss of flood, boiled water before drinking, collected relief if provided by govt. and non-government organizations, and took shelter on roads or at other shelter centers. After flood, they repaired damaged houses; communicated with Union Parishad representatives and other service providing or organizations and started agricultural and other income generating activities as soon as possible.



### 3.4 Necessity of local resilience practices

The community area was flood-prone and vulnerable due to flood every year. Flood had direct impact on the livelihoods, health, safe water, sanitation facilities and social security of the community people. During flood period; there was lack of available food, drinking water and sanitation. Communication system was destroyed, and the people used to suffer from various diseases. So, the community people must need to cope with the disaster's situation. For this, focus on addressing the resilience is essential for the community people to help them for coming back on the usual situation after any types of natural disaster. In order to enhance local resilience. Enough knowledge on flood early warning system should be increased and disseminated among the community people and its continuation should be ensured. If the community people, enough knowledge in this regard then they can take proper preparation and response initiatives before flood and they will preserve assets and properties during the flood. Community people's understanding on climate change, resilience and adaptation should be increased through different types of initiatives and programs. In this regard, the indigenous knowledge of the community people are great resources which could to be utilized while making them sensitized on climate

change, adaptation and resilience. It was found that during the flood, most of tube-wells and latrines were inundated during the flood. This time, the community people used to face problems of safe drinking water and hygiene management. The *Kaccha*<sup>7</sup> houses were found comparatively more the community. Beside this, there were Semi-pucca, Pucca houses and huts as well. But, the *Pucca*<sup>8</sup> houses and huts<sup>9</sup> were found also. The community people with more financial capability used to live Pucca houses while many of the people were living at hut as they could not afford making *Semi-pucca*<sup>10</sup> or Kaccha houses. So, the community people context-specific (flood resilient) water points, latrines and shelter (house) so that these infrastructures can be withstanding during the disaster specially the flood period. A community information center should be established so that the community people can gather and know about different issues like flood vulnerability, disaster risk and resilience aspects etc. In this regard, a flood center can be established at this community so that the community people get updates about flood during the flood season. In this community, agriculture and day laboring were only the main modes of income for the community people. To improve livelihoods, different profession like tailoring, small business can be initiated by providing training on the respective profession. In this regard, proper market linkage should be established so that the community people get the worth of their work initiatives. This type of initiatives should be taken by Government and non-government organizations and special considerations are essential in this regard. Beside these initiatives, other service providing organizations should also take initiatives to reduce vulnerability through taking measurements like establishing shelter-centers, starting small scale mitigation programs, making more working opportunities for the community people, providing flood-resilience crops to the communities and arranging livelihood improving trainings etc.

### 3.5 Conclusion

It is obvious that climate change is keeping direct contribution to flood Bangladesh. Flood has both economic and non-economic impacts and is hindering the development of country and making the community people hugely suffered. It makes obstacles

<sup>7</sup> *Kaccha* houses are made from mud, thatch, or other low-quality materials are called *Kaccha* houses

<sup>8</sup> Pucca house refers to dwellings that are designed to be solid and permanent

<sup>9</sup> A hut is a primitive dwelling, which may be constructed of various local materials

<sup>10</sup> Semi-pucca house that has fixed walls made up of pucca material, but roof is made up of the material other than those used for pucca houses.

to the development and becomes the threat for the people to come out from poverty as disasters have direct relation with poverty. When the people in society cannot come back to their normal situation after any type of disasters, then they fall into the poverty cycle. If the extreme events like floods continue happening years after years, then it will surely hinder the development at both rural and urban areas. It is also considerable that Bangladesh is in such a position where flood will continue to occur. So, initiatives to tackle flood should be taken not only from regional but also at global level collaboratively. For this, enchaining community resilience is the key to tackle this challenge in future and they can cope with the flood risk.

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