

## Disaster Risk and Vulnerability Assessment in the Southwest Coastal Region of Bangladesh

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**Abstract:** *This study has assessed natural disaster risks, people's vulnerability and adaptation practices through community based framework of Bangladesh. Storm surge, cyclone, river erosion, westerly wind, salinity intrusion, erratic rainfall, water logging and such other major and common natural hazards frequently affect the coastal community in almost every year, whereas, mega-cyclone usually occurs there at every 10 years interval cycle. The intensity and frequency of natural hazards have increased with climate change. In last 30 years (1978-2007), the trend of temperature has gradually been increased by about 1<sup>0</sup> Celsius, increased erratic rainfall and salinity intrusion in the South-west coastal region of Bangladesh (Das. Mahanam, 2011). Risks and vulnerability increased due to prolongation of hydro-meteorological events which affecting the life, livelihoods and adaptation practices and ecosystem of the coastal region. Major seven cyclones and storm-surges occurred in coastal area within last 50 years due to geographical location and weather condition. In view of such hazards, many people seem to have become asset-less and resource-poor at the cost of their lives and properties. Climate, change, unplanned development activities and interruption in the natural process, lack of river and canal management, unplanned embankment, lack of maintenance of infrastructure and deforestation have been considered responsible as the causes of natural disasters in the coastal region. Both soft and hardware related activities such as awareness raising, capacity building on disaster preparedness and disaster management, early warning, developing information dissemination system, construction of community based shelter home, plinth level raising, ensuring food security, livelihood development, coastal forestation, technically sound infrastructure and water management with community ownership may be effective to improve community's resilience, ecosystem and adaptation practices.*

**Key words:** Hazard, disaster, vulnerability, adaptation, community based hazard risk assessment

### Introduction

Global climate changes are expected to affect coastal communities around the world where Bangladesh has already affected severely (IPCC, 2001). The IPCC also forecasts that global warming will result in seas level rises of between 0.18 and 0.79 meters which could increase coastal flooding and saline intrusion into aquifers and rivers across a wide belt in the south of the country, although most of the area is protected by polders. The IPCC also focuses that Bangladesh is at great risk under global climate change due to sea level rise and cyclones. It lost an estimated 5.9% of GDP to storms from 1998-2009. Climate change related hazards will affect the food productivity, will impact on livelihoods and exports, increase poverty levels.

Despite the success of the economic growth, the country is on track to become a middle income country by 2021, more than 50 million of the people still live in poverty (Fifth five year plan, GOB 2007). Many of these people live in remote or ecologically fragile parts of the country, such as river islands (chars) and cyclone-prone coastal belts, which

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are especially vulnerable to natural disasters (MoEF, 2009). Climate change will severely challenge the country's ability to change the high rates of the economic growth needed to sustain these reductions in poverty. In coming years, it is predicted that there will be increasingly frequent and severe flood, tropical cyclones, storm surges, and droughts, which will disrupt the economy of the nation. In the worst case scenario, unless existing coastal polders are strengthened and new ones built, sea level rise could result in the displacement of millions of people- 'environmental refugees'- from coastal regions, and have huge adverse impacts on the livelihoods and long term health of a large proportion of the population. It is essential that Bangladesh prepares now to face the challenge ahead and safeguard the future economic wellbeing and the livelihoods of her people (MoEF, 2009). Over the last three decades, the Government invested billions of dollars to make the country more climate resilient and less vulnerable to natural disasters. The Government has implemented important projects including construction of coastal embankment and cyclone shelters with the active participation of communities. The Government demonstrated its readiness in dealing with disasters in 2007 when the country suffered two serious floods and a severe tropical cyclone (Cyclone Sidr) in the same year (MoEF, 2009).

Disaster risk signifies the possibility of adverse effects in the future. It derives from the interaction of social and environmental processes, from the combination of physical hazards and the vulnerabilities of exposed elements. The hazard event is not the sole driver of risk, and there is high confidence that the levels of adverse effects are in good part determined by the vulnerability and exposure of societies and social-ecological systems (Birkmann 2006).

The main purpose of the study is to provide an evidence of changes in the community of natural hazard risks and vulnerability as well as response in the area for adaptation practices. Since all the communities are not same and different communities may have different risks, the Community Based Risk Assessment for planning of adaptation strategy has been undertaken where all types of social groups of the locality including women, physically challenged people, members of UDMC<sup>1</sup> and UzDMC<sup>2</sup> were involved.

## **Objectives**

The main objective of the study is two-fold

- To provide an evidence of changes and identify adaptation practices through community based risks assessment framework
- To assess the vulnerability of community people considering climate change, local hazards and disaster.

## **Methodology**

### **Operational Definition of Community Based Risk Assessment**

Community risk assessment is an inclusive participatory method to assess local hazard, risk, and vulnerability, capacity to cope and finally explore the options to reduce potential

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<sup>1</sup> UDMC means Union Disaster Management Committee

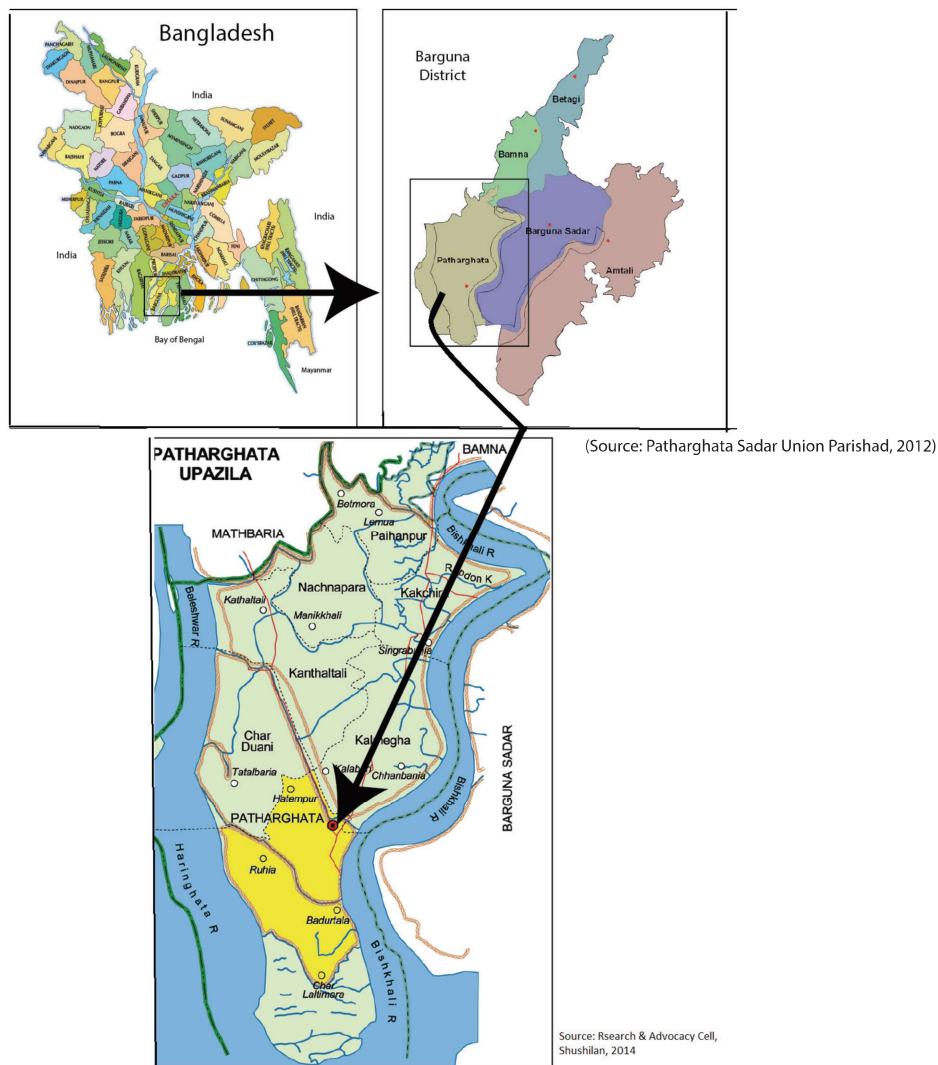
<sup>2</sup> UzDMC means Upazila Disaster Management Committee

risks to be adopted by the community. The purpose of a community risk assessment is to guide practical steps in preparedness and mitigation that reduce both the chance of emergencies and the consequences when they cannot be avoided.

### Selection of the Study Area

*Patharghata Sadar Union*<sup>3</sup> of *Pathargahta Upazila*<sup>4</sup> is situated by the seaside of the South Bay of Bengal with an area of 50.36 sq km. It is inland with 12 villages and Mouzas surrounded by River *Boleshor*, River *Bishkhali* and some canals. Total population of this Union is about 33840 including 16241 female and 17599 male and rate of education about 68.56%. Most the people's professions of this Union are about 45% agriculture and about 40% fishing. This union was severely affected by cyclone *Sidr* in 2007.

Map: study area



<sup>3</sup> Union means the lowest administrative unit of Bangladesh

<sup>4</sup> Upazila means sub-district

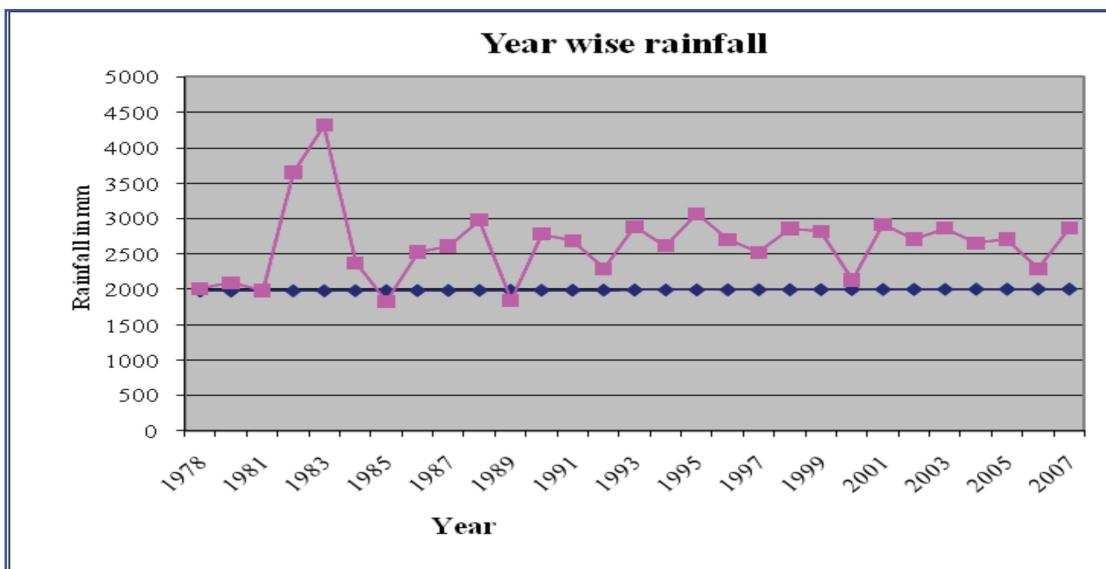
### Data Collection and Analysis

Qualitative approach was followed to complete the study whereas the numbers of Participatory Rural Appraisal (PRA) tools were used to collect data from the community level. The study conducted transect walk, 30 Focus Group Discussions (FGDs) and 14 Key Informant Interviews (KIIs), 12 mapping on social, hazard and risks 8 Van Diagram of hazards and 8 seasonal calendars on livelihood and hazards. Secondary data were collected from meteorological department, local government institutions, disaster related government reports and research publications.

### Results and Discussion

#### Rainfall and Temperature

Bangladesh is a country of six seasons. However, recently three seasons are mainly observed. The local people informed that the intensity and rainfall increased in the study area. However, the seasons have changed such as earlier July-August were the time of rain and would continue up to October, which would do less harm to crops. In the last 5-6 years, rainy season is observed to start too late instead of July-August that harm crops of land, particularly Aman paddy. Sometimes, seedbed or production of saplings is hampered. Further, in some years, crops (vegetables and Aman paddy) are damaged due to heavy rainfall; sometimes even continue for 6-7 days, which cripple the livelihoods of the people. General people think that because of climate change, irregular rainfall has increased (Upazila Agriculture Office, FGD). Analyzing last 30 year's secondary scientific data, it is observed that annual rainfall were between 2000-3000 ml. However, difference is observed in rainfall in different years. It is mentionable that the highest rainfall i.e. 3658 ml and 4320 ml was in 1981 and 1982 respectively (Figure 1).

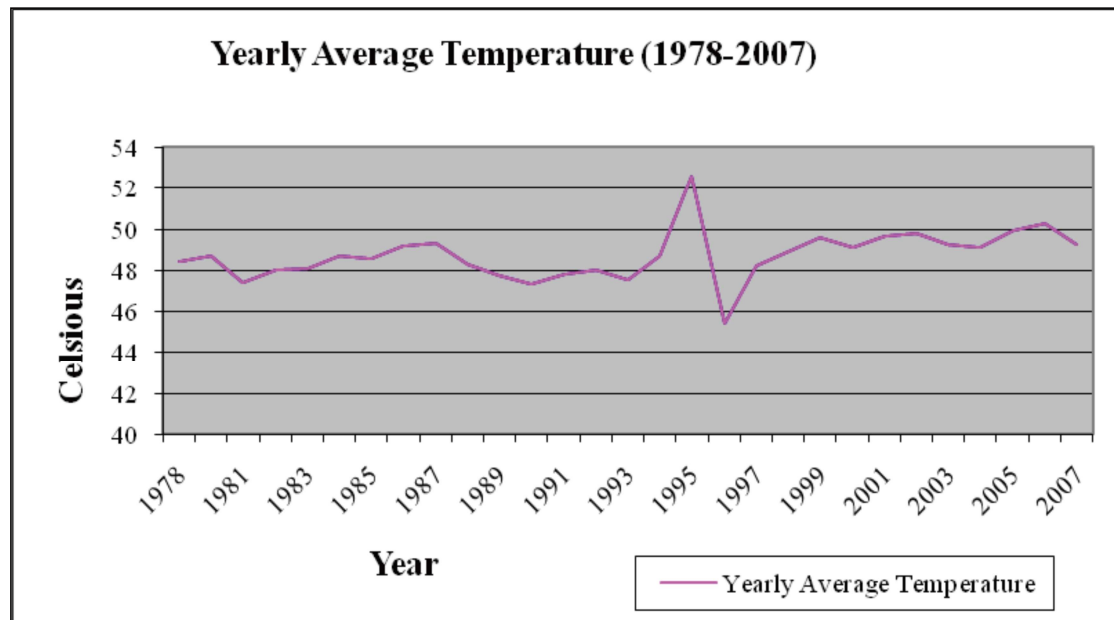


**Figure 1. Year Wise Rainfall**

(Source: Meteorological Department, Dhaka, 2012)

The analysis of the secondary scientific data of the last three decades reveals that the annual average temperature has gradually been increased in the study area. The local people consider deforestation as its cause and creation of no new forest. As a result,

agriculture, fisheries and other sectors are being affected. The annual average temperature in the study area in the decade of 1978-1987 was 33.3° Celsius, which increased to 34.07° Celsius in 1998-2007. In the last 30 years, temperature increased by 1° Celsius. The lowest temperature was 32.43° Celsius in 1998 and the highest was 34.53° in 2006 respectively (Figure 1).

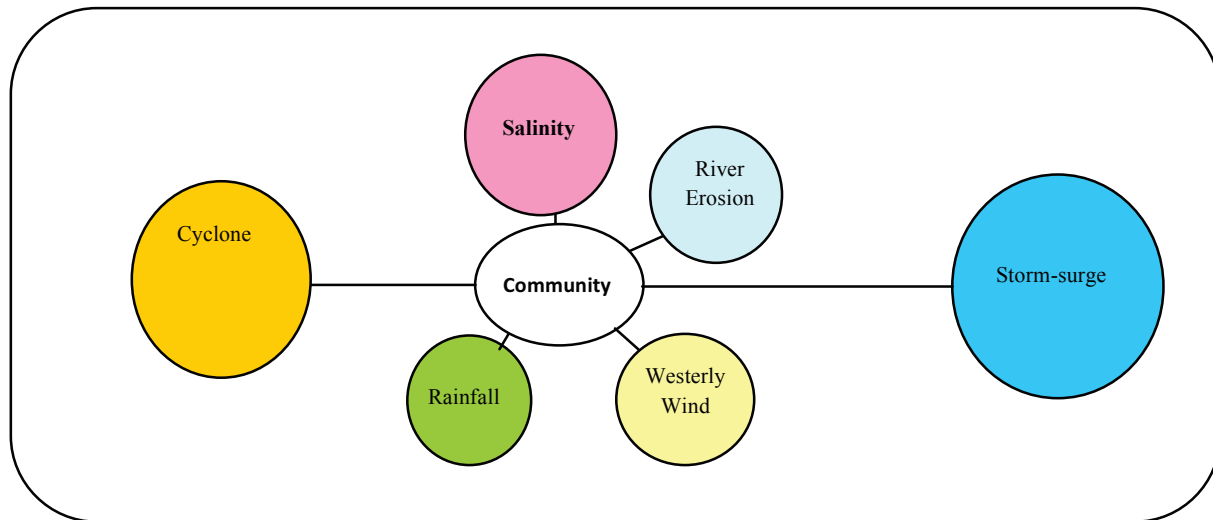


**Figure 2.** Yearly Average Temperature

(Source: Meteorological Department, Dhaka, 2012)

### Hazard Venn diagram

Inclusive participation of the community including farmers, physically challenged, men and women were participated in Focus Group Discussion to identify and analyze the common natural hazards which take place locally. The study reveals that the community's perceptions to common risks around the year are mostly related to hydro-meteorological phenomena. The community also commented that the intensity and frequency of hydro-meteorological events increased and occurred over the year, which are, at the same time, expanding by duration. Communities are facing different difficulties of hazards and vulnerability for longer and unusual time which is ultimately threatening to the capabilities of the adaptation. The following van diagram shows that major hazards of the community (Patharghata sadar UP) include storm-surge, cyclone and salinity intrusion which severely affect their life and livelihoods. On the other hand, river erosion, erratic rainfall and westerly wind are considered as minor hazards which moderately affect to agriculture, life and livelihood of the community. The diagram also shows that frequency of the salinity and rainfall is high almost every year affects the community whereas river erosion and westerly wind occurs after two or three years. The frequency of cyclone and storm surge includes five to ten years and ten to fifteen years respectively as well as the intensity of both hazards is increasing. Like both cyclone and storm surge, the intensity of the salinity is intensifying.



**Figure 3.** Community Hazard Venn diagram

(Source: Community Hazard Risk Assessment, 2012)

### Hazard Map

The study team collected Mouza Map from Local Government Engineering Department (LGED). The team has prepared the hazard map (Figure 4) through participatory way with involving of different social and occupational groups such as Union Disaster Management Committee (UDMC) members. Participants identified the disaster prone area based on their experience. Boleshor and Bishkhali River respectfully flow in the West and in the East side of Patharghata Sadar Union which increased multiple risks of hazards. The common hazards of this area include cyclone, storm-surge, salinity, river erosion, westerly wind and pest attack. Different symbols have been used for presenting different hazards and intensity of hazards such as the number of symbols for 1, 2, 3 and 4 used for presenting low, medium, high and acute intensity of hazards respectively. The West and the East side of the study area are mostly affected by river erosion and storm-surge whereas middle and south part mostly had an effect of salinity.

**Seasonal Calendar and Livelihood Activities:** Seasonal calendar and livelihood activities tracks seasonal changes, climate-related and other hazards, community events and activities related to a specific month. In the agricultural sector, this is used primarily to plot seasonal farm activities. Agriculture farming such as fishing, paddy and vegetable cultivation are being affected due to climate related hazards such as storm-surge, cyclone, salinity and westerly wind. Fish breeding place has been changed and local variety of fish species have been decreased due to climatic condition and natural hazards. Paddy and vegetable farming severely affected due to increasing tendency of salinity intrusion. Salinity level increases in winter season particularly from the month of January to March. Agriculture fields and different infrastructures such as embankment, cyclone shelter, settlement, fishing boat anchoring area and market place are mostly affected by river erosion whereas intensity of river erosion generally increase during rainy season from the month of July to October. In the following Table 1 shows the seasonal livelihood activities and natural hazards of the study area.



**Table 1:** Community Seasonal Calendar and Livelihood Activities

Livelihood activities	April-May	May-June	June-July	July-August	August-September	September-October	October-November	November-December	December-January	January-February	February-March	March-April
Fishing												
Rice (Aman) Harvesting												
Rice (Buro)harvesting												
Vegetable farming												
<b>Hazards</b>												
Storm-surge												
Cyclone												
Salinity												
River erosion												
Westerly wind												

## Social Mapping

The participants of FGD sessions prepared social map based on their experience, observation and perception. The Figure 5 shows the different social structures such as household, health centre, school, mosque, market, office, Eidgha, Temple, UP complex, Club, hospital, Agriculture land, hat/bazaar, water-body, drinking water point, road, embankment, culvert, play ground, settlement, river etc. This map also indicates the social characteristics of the catchment area. The density of settlement is highest in the road side. A few settlements are found outside of embankment by the side of Boleshor and Bishkhali River where landless poor people live there. Although South is equally risky and vulnerable to cyclone and storm-surge, there is no cyclone shelter or high rise building to save people's lives. The embankment about 20 kilometers built in 1965 by Bangladesh Water Development Board (BWDB), but maintenance is not satisfactory. Most of the agriculture land situated in the middle part of the Patharghat Union, whereas, forestation by Upazila forest department is seen in the West, in the South-west and in the East-west.

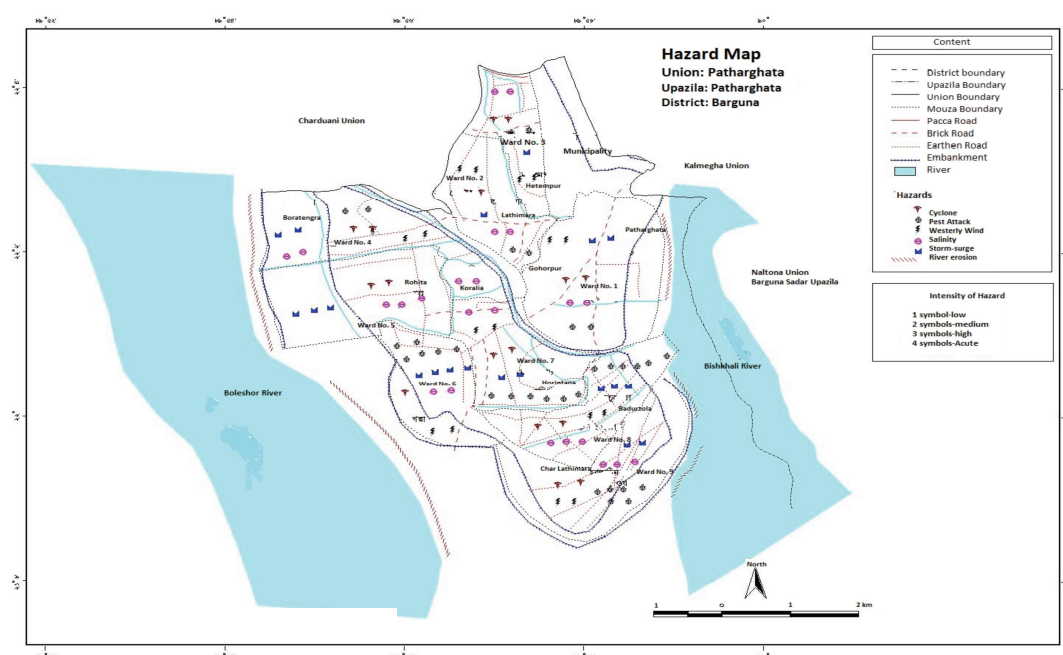


Figure 4. Hazard Map of the Study Area

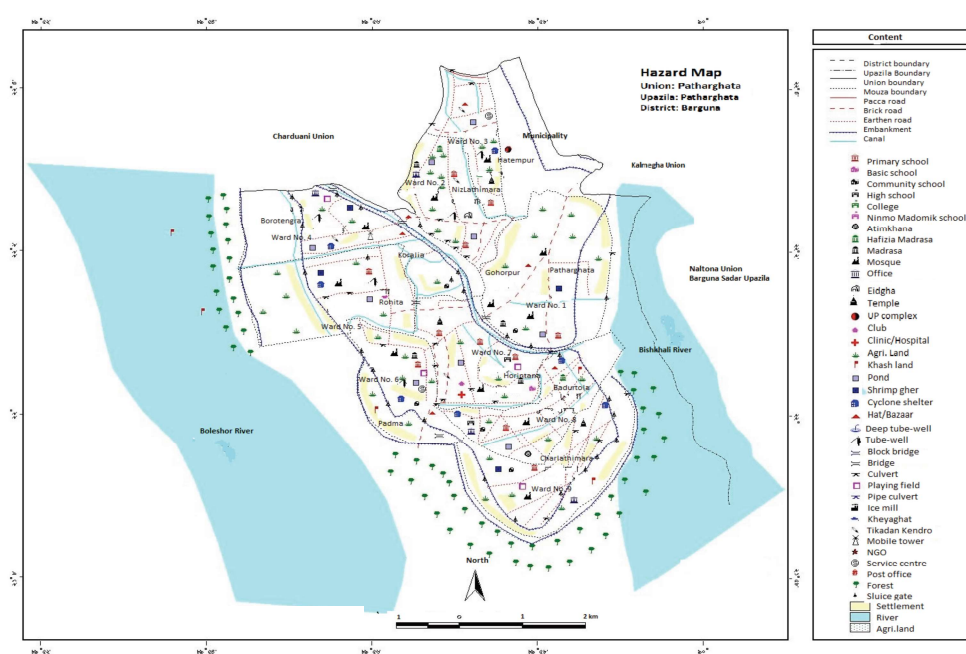


Figure 5. Social Map of the Study Area

### Vulnerable Sectors and Community Risks

The vulnerable sectors of the study area are agriculture, fisheries, infrastructure, health, forest, livestock, business etc. And with these, the concerned sub-sectors/social elements are also affected by different hazards. For instance, infrastructure is a sector and its components are said to be embankment, houses, educational institutions, hat-bazars, office buildings, bridge/culverts, roads, etc. However, the community risks are



considered the combination of an event, the likelihood that it will happen and its consequences. Hazards are also identified by community as event or physical condition that has the potential to cause fatalities, injuries, property damage, infrastructure damage, agricultural loss, damage to the environment, interruption of business or other types of harm or loss. Community risks and vulnerability of the study area has been identified based on three elements: probability, exposure and consequences. Moreover, natural characteristics including geographical area, severity and time also have been considered for each risk. In most cases, an extreme event may create multiple hazards. Sometimes, the hazard is triggered to a large scale of effects. Damages, loss of assets, life and livelihoods depend on the nature of hazards, geographical coverage and their behavior. In the following table shows that the sectors such as agriculture, infrastructure, fisheries, health and forest were affected by hazards in different period of time and have probability to be affected again.

**Table 2:** Risky Sectors with Hazards

Sectors	Sub-sectors	Hazards				
		Storm-surge	Cyclone	Salinity	Westerly Wind	River erosion
Agriculture	Aman/Aush	✓	✓			✓
	Vegetable/Boro	✓		✓		
	Livestock/poultry	✓	✓	✓		
	Honey collection	✓	✓	✓		
Fisheries	Fish trading	✓	✓			
	Aquaculture	✓	✓	✓		
	Fish collecting	✓	✓			
Infrastructure	Bridge/culvert/electricity/mobile tower	✓	✓			✓
	Embankment	✓	✓			✓
	Roads	✓	✓			✓
	Office	✓	✓		✓	
	Education. Institutions	✓	✓		✓	✓
	Tube-well/pond/PSF/River/canal	✓	✓			
	Housing	✓	✓	✓		✓
Health	Safe water	✓	✓	✓		
	Diseases	✓	✓	✓		
	Water and Sanitation	✓	✓	✓		
Forest	Natural forest	✓	✓	✓		
	Social and community forest	✓	✓	✓	✓	
Life	Human life	✓	✓			

Source: Community Hazard Risk Assessment, 2012

### Problem Ranking and Priority

The community people have prioritized and have ranked the natural hazards and risky sectors based on their experience. This study matrix ranking also analyzed the problems considering the rate of community priorities, significance of the problems faced by the community. Finally this matrix has been validated through consensus meeting at the community and *Union Parishad* level. In table 3, community ranked/ prioritized the problems as below

**Table 3:** Problem Ranking/ Priority

Problem	Rank/ Priority
Storm-surge	1
Cyclone	2
Salinity	3
River bank erosion	4
Westerly wind	5
Erratic rainfall	6

*Source: Community Hazard Risk Assessment, 2012*

The above table presents that hazards such as storm-surge, cyclone and salinity intrusion have got most priority in problem ranking because of their severity of effects in different sectors of the community. Then natural hazards such as river bank erosion, westerly wind and erratic rainfall affect their livelihoods. As per livelihood trend, the community is dependable to agriculture farming, fishing and non-farming activities. Life and livelihoods are affected due to extreme events of cyclone and storm-surge. Incidence of crop failure is increasing in the coastal area due to salinity intrusion. In 2007, due to cyclone Sidr thousands of people were become asset-less, suffered from unemployment, food insecurity, malnutrition and scarcity of safe drinking water which increased their poverty and vulnerability. Level of salinity intrusion increased in ground and surface water which had an effect on drinking water and agriculture farming. These natural calamities due to climate change might have triggered the changes of livelihood pattern in the region. A large number of resource poor community is migrating into non-farming activities such as day labour as their alternative of livelihoods and the rate of these changes have gained pace in the recent years. Many households also migrated to local town, divisional city and capital city after cyclone Sidr in 2007 and storm-surge Aila in 2009.

### Risk Analysis and Evaluation

The participants of the community measured risks as its effects, consequence, probability and their acceptance level. In this study, qualitative and quantitative relationships between benefits and associated risks are determined to risk management. The community analyzed and evaluated the risks in matrix format in regard to possible effect, extent of effect, probability of occurrence, extent of risk and acceptability which are given below table 4.

**Table 4:** Community Risk Analysis and Evaluation

Description of Risk	Possible effect	Extent of effect	Probability of occurrence	Extent of risk	Acceptability
If storm-surge/cyclone occurred, significant percentage of agriculture land, fisheries and shelter of livestock sectors will be destroyed	Damaged	High	10 years interval	High	Not acceptable
If storm-surge/cyclone occurred, significant percentage of infrastructures, 50% of roads, 60% of houses will be submerged/damaged	Damaged house/embankment/	High	10 years interval	High	Not acceptable
If storm-surge/cyclone occurred, significant number of water and sanitation points may be affected	Damaged drinking water reservoirs and sanitation facilities	High	10 years interval	High	Not acceptable
If storm-surge/cyclone occurred like cyclone sidr of 2007, significant number of forest land and environment will be affected	Life and asset loss/ different diseases	high	10 years interval	High	Not acceptable
If westerly wind occurred, some agriculture field, fishery, forest, market area may be damaged	Damaged	Medium	Each year	Medium	Not acceptable
If salinity intrusion increased, significant percentage of agriculture field, fisheries, forest, drinking water point will be affected	Food insecurity, mal nutrition and different diseases	Medium	Each year	Medium	Not acceptable
If river erosion occurred, 150 acre of agriculture land will be affected	Destroyed /food insecurity	Medium	Each year	Medium	Not acceptable
If river erosion occurred, 250 houses, 10 km roads, 2 km embankments may be destroyed	Destroyed	Medium	Each year	Medium	Not acceptable

Source: Community Hazard Risk Assessment, 2012

***Cause Analysis of Risks and Adaptation***

Causes of risk, its analysis and adaptation measures have been identified by the participants in matrix format through group work and brain storming. The community also analyzed the causes of risks, adaptation mechanisms in regard to possible risks, causes, possible measures of adaptation or risk reduction and probable timeline which are given below table 4.

**Table 5:** Cause Analysis of Risks and Adaptation Mechanisms

Risks	Causes	Possible measures of adaptation/risk reduction	Time line
If storm-surge/cyclone occurred, significant percentage of agriculture land, fisheries and shelter of livestock sectors will be destroyed	Sudden occurrence of cyclone/sudden entrance of excessive water flow/ No forecasting / Weak embankment /low land	Early warning and signal/ construction, repairing and rise height of embankment/ awareness raising/ disaster preparedness/ construction and repairing of sluice gates/ early harvesting crops /construction of earthen mound	Short and long term
If storm-surge/cyclone occurred, significant percentage of infrastructures, 50% of roads, 60% of houses will be submerged/damaged	Excessive water flow / No early warning// Weak embankment / lack of shelters/low height of plinth level	Early warning and signal/ construction, repairing and rise height of embankment/ awareness raising/ construction and repairing of sluice gates/ plinth level raising/disaster resilience housing	Short and long term
If storm-surge/cyclone occurred, significant number of water and sanitation points may be affected	Lack of planning/lack of awareness/ lack of disaster resilience sanitation	Planning on sanitation/disaster resilience sanitation installation/awareness raising	Short/mid-term
If storm-surge/cyclone occurred like cyclone sidr of 2007, significant number of forest land and environment will be affected	Deforestation /lack of awareness/ low land /role of law about forest policy	Coastal and community forestation/ awareness raising	Short/mid-term
If westerly wind occurred, some agriculture field, fishery, forest, market area may be damaged	Lack of Awareness and lack of disaster preparedness/	Awareness/ disaster preparedness/ crops and livestock insurance/life jacket for fishing boat/disaster resilience fishing boat/disaster resilience market	Mid/long term
If salinity intrusion increased, significant percentage of agriculture field, fisheries, forest, drinking water point will be affected	Low height of embankment/ lack of maintenance of structure/sluice gates/	Planned and scientific structure/ disaster resilience water points/ water and infrastructure management	Mid/long term
If river erosion occurred, 150 acre of agriculture land will be affected	Lack of river and canal excavation/ lack of river management/ lack of planning of water department	Forestation by the side of river/ planning and water management	Long term
If river erosion occurred, 250 houses, 10 km roads, 2 km embankments may be destroyed	Housing by the side of the river/ no piling/ weak planning and management	Forestation/ law about no housing outside of the embankment/ management of water and infrastructure	Long term

Source: Community Hazard Risk Assessment, 2012

## Recommendations

Disaster risk assessment is a bottom-up approach. It may contribute to the community's awareness about potential risks, may provide support agencies with information in order to draft emergency appeals. It may also work as a baseline data to identify the damage, needs, capacities of the community to respond during, pre and post disaster purposes. Besides, the following both structural and non-structural measures may be effective for adaptation and resilience practices at the community level.

### Non-structural measures

1. **Awareness:** Awareness raising of community people about pre and post disaster preparedness, about early warning and signal system, about natural and community forestation, create ownership about public property may improve their adaptation capability and resilience power against disaster.
2. **Capacity building:** Formation and capacity development of volunteers groups and rescue team at the community level. Besides, resource poor and vulnerable people may get capacity building, income generating and livelihood development training and assets support to improve their resilience to adapt with natural hazards and disaster.
3. **Information dissemination:** Right information dissemination in right time and right place by the volunteers, electronic media and information technology such as mobile. Moreover, if rescuer and volunteers get confirmation of information of danger signal from the station, they may get power to evacuate the vulnerable people from hot spots. Effective information dissemination through information technology may be developed for the fishing boat of the deep sea.
4. **Community ownership:** Hazards substantially affect people's life and livelihoods due to climate change. Thus, it is important to ensure inclusive people's participation in planning, implementing, monitoring & evaluation phase so that community people can draw their comments and interests for win-win solution.
5. **Food security:** Innovate saline and flood tolerable crops & horticulture, awareness raising and capacity building to agriculture farmers on improved agriculture technology may increase diversified crops and food production.
6. **Water management:** Maintenance and re-excavation of river and canals may reduce river bank erosion, water pressure of storm surge and flood. Besides, It is also recommended to form and activate polder/river/canal based water & silt management committee by the community for effective operation and maintenance of the structures and water bodies. For instance, the authority may use good practices of projects "Small Scale Water Development Project" implemented by Local Government Engineering Department, Bangladesh; "Integrated Planning for Sustainable Water Management (IPSWAM)" and 'Blue Glod' project implemented by BWDB.

### Structural measures

**Construction and maintenance of infrastructure:** It may increase resilience of the community for construction and re-construction of embankment/sluice gate/road/cyclone shelter/signal light post, maintenance and ownership of them by the coastal community. Community base shelter home design and implementation in the

coastal area may be effective to save a significant number of people's lives and their properties during disaster. It is also very important to make disaster tolerable infrastructures by considering the rise the level of the plinth of homestead, the height of the roads and the embankment.

## **Conclusion**

Bangladesh is recognized as a disaster-prone country due to frequent occurrence of flood, cyclone and storm-surge. Climate change, unplanned development activities and human interruption in the natural process, river mismanagement, unplanned embankment and deforestation are considered in responsible for the causes of natural disasters. However, to cope up losses of one disaster, other disaster take place and make people more vulnerable. In view of such disasters, many people seem to have become asset-less and resource-poor at the cost of their lives and properties which tremendously affects on national resource base and economy of the country. Even no effort and programs were taken by any quarter as a long-term strategy to reduce risks of disaster on human lives and assets of the country. The main purpose of the study is to provide an evidence of changes in the community of natural hazard risks and vulnerability as well as response in the area for adaptation practices. Since all the communities are not same and different communities may have different risks, the Community Based Risk Assessment for planning of adaptation strategy has been undertaken whereas all types of social groups of the locality including women, physically challenged people, members of UDMC<sup>5</sup> and UzDMC<sup>6</sup> were involved. Considering the situation from both global and local level, particularly while the Bangladesh is taken in consideration, climate change has become an issue that just cannot be ignored anymore. This study actually draws the complete scenario of the existing risks and problems in different sectors (including agriculture, fisheries, infrastructure, health, forest and life) of the study area at community level. The climatic risks addressed by the community and the other secondary assessment have provided similar anomalies for the study area. The solution has been drawn by the inclusive participation of the community also praise worthy and feasible. The assessed risks and related issues regarding the risks have broad domain of adverse effect than they normally appears. The study area is environmentally vulnerable and ecologically fragile. Thus, the identified climatic risks and probable solutions by the community may also be got special attention in the policy for appropriate technological, structural and non-structural support for coastal belt.

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<sup>5</sup> UDMC means Union Disaster Management Committee

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