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Study on the Disaster Risk Reduction for the Development of Bangladesh

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Abstract

This research deals with the problems encountered by stakeholders in different sectors attempting to meet the needs of natural disaster affected people in Bangladesh. The work was set when disasters in Bangladesh used to be handled without a coordinated disaster management effort and gradually developed having various policies and laws aimed at mitigating disaster risks and vulnerabilities. This study is descriptive in nature. The subject has been approached using quantitative and qualitative research methods, including personal engagement in disaster zones. In the quantitative section, social survey method was followed. In the qualitative section, technical investigation survey, Focus Group Discussion (FGD) and Case Study was applied to gain vital information and an in-depth understanding. The present study mainly incorporates Crunch model and Pressure and Release Model in explaining the mitigation strategies as well as the DRR intervention process. Findings included the three resistance factors occupying the most significant position to be: magnitude of disaster (risk and vulnerability); the state of disaster management actors both in formal and informal sectors; and DRR interventions in southwest Bangladesh. Any DRR interventions must also include these five factors: physical assets, environmental protection, livelihood, Water and Sanitation and training and awareness. For any DRR interventions to be successful, stakeholders should concentrate on the social structure and various socio-cultural factors like religious perceptions, social values, village politics, and dominance of local leaders and so on. This research seeks to address an identifiable problem that has not been previously examined sociologically, while also offering suggestions regarding the scope for further research on Disaster Risk Reduction interventions.

Key Words: *Disaster Risk Reduction, Disaster Management, Bangladesh*

INTRODUCTION

Climate change has increased unprecedented threats to life and livelihoods of people living in coastal areas of Bangladesh. Over the time, coastal population has confronted a number of tropical cyclones and storm surges, and voluminous salinity ingress. The geographical location of coastal areas along the Bay of Bengal has itself been manifested with such firsthand vulnerability of people to natural disasters followed by negative impacts on their life. Following any disaster, people always remain less able to cope and continue their regular life supporting livelihood function due to few alternative resource endowments in coastal area. Disproportionate resource distribution and access to natural resources and institutional services, particularly landless poor and marginal farmers face extremely vulnerability to disaster shocks. With climate changes and of its increasing degree of impacts, the vulnerability of coastal people goes beyond any of their least coping capacities and remains far off long-term adaptation.

Along with disaster shocks, few livelihood options and disproportionate land ownership pattern are some of the important challenges people face at the grass root level. A significant size of agriculture lands is currently possessed by only 5 percent of people. By contrast, landless (>30%) people have very limited access to agriculture, and face the hurdle for livelihood on only daily basis works or through commodity

collection from local resources. Majority of people depend on agricultural farming and related jobs as a key livelihood for household income. Farming systems provides basic household food to a large number of people in a year. But, with increased weather changes followed by storm weather and increased cyclone, fish catch has dropped to some extent. Household poultry and domestic animal rearing could be potential source of supplementary income. Nevertheless, poultry and livestock resources have been affected with epidemic followed mortality and there is yet to be found any adequate service of respective departments.

The sudden hazard occurrence, mainly heavy rainfall and high tide is increasing critical risk to agricultural farming and pond fish cultivation in the area. The subsistence and marginal farmers incurred most significant loss from abrupt weather events that eventually increased their financial burden due to borrow of lands and money. Notably, the sudden risk from weather variability have not been incorporated within community itself or any external institutional support for alternative livelihood measures, by result climate related risks remain to growing up in future. The existing institutional capacity of either govt. or NGO needs to be expanded. The respective department has ample opportunities to provide climatic risk information to livelihood specific groups, irrigation facilities for Boro cultivation, improved rice and vegetable varieties, financial access of marginal people and landless people and establishing educational institutes.

The climate database of Bangladesh now expressed as Agro-ecological Zones in all spheres of development having diverse situation as regards temperature regime, humidity, hydrology, land, soil, agro-climate parameters and others. A brief account of the AEZ as outlined for the context of the present studies is mentioned here stating the Geographical Information System (GIS) coverage.

Table 1: AEZ: Major GIS Location

AEZ	AEZ name	Major area Districts
1	Old Himal Piedmont	Panchagar, Thakugaon
2	Active Tista FP	Nilphamari, Rangpur, Lalmonirhat,
3	Tista Meander FP	Greater Rangpur, Panchagar, Dinajpur
4	Korotoa- Bang FP	Sirajganj, Bogra
5	Lower Atrai Basin	Noagaon, Natore
6	Lower Purna FP	Noagaon
7	Active Brahm-Jam FP	Kuri Gai, Bogr, Pab, Sher, Tang, Jam, Manik
8	Young Brah Jam FP	Sher, Jamal, Tang, Manik, Dhaka, Munsiganj,
9	Old Brahmaputra FP	Sher, Jamal, Tangail, Mymen, Netrakona
10	Active Ganges FP	Nowabganj, Rajshahi
11	High Ganges Riv FP	Nowabganj, Rajsh, Pab, G Kustia, Jhenaida
12	Low Ganges River FP	Natore, Pabna, G Faridpur, Kustia Khulna
13	Ganges Tidal FP	Barisal, Jhalokati, Pirojpur, Patuakhali
14	Gopalganj Khul Beels	Madaripur, Gopalganj, Narail
15	Arial Beel	Munsiganj
16	Middle Megh River FL	Kishoreganj, Brahmanbaria, Comilla
17	Lower Megh River FL	Chandpur, Laksmipur
18	Young Megh Estu FP	Chittagong, Feni, Noakhali, Laksmipur, Bhola
19	Old Megh Estua FP	Kishoreganj, Habiganj, G Comilla G Noakhali,
20	Eastern Sur-Kushi FP	Sylhet, Moulvibazar

AEZ	AEZ name	Major area Districts
21	Sylhet Basin	Sunamganj, Habiganj, Netrakona
22	North and East pied	She, Netra, Sunam, Sylh Moulvibazar
23	Chitt Coastal plain	Chittagong, Feni
24	Saint Martin Coral Is	Coxsbazar
25	Level Barind Tract	Dinajpur, Joypurhat, Bogra
26	High Barind Tract	Rajshahi, Nowabganj
27	North east Barind	Dinajpur, Rangpur, Bogra
28	Madhupur Tract	Dhaka, Gazipur, Narsingdi, Tangail
29	North and East hills	Khag, Ranga Bban Mbazar, GChitt, Habiganj
30	Akhaura terrace	Brahmanbaria

OBJECTIVES OF THE STUDY

In the context the present research programs were formulated for getting outputs in light of the following objectives:

1. To know the present status of different disaster events as per Agro-Ecological Zones of Bangladesh.

2. To identify the major causes of intensive and extensive disaster events.

3. To prioritize the potential technologies for reducing disaster effects.

METHODOLOGY

The methods and materials included in the studies are summarized below. The studies involved the tools such as:

- Technical investigation survey
- Focus Group Discussion (FGD)
- Case Studies.

Design of the Study

1. Technical investigation survey using one questionnaire and checklist guideline.
2. Focus sessions in group using a guideline as per objectives.
3. Making and analyzing significant case studies.

Study Zones and Sites

- Tista Alluvium (AEZ 2and 3): Greater Rangpur and Dinajpur
- Brahmaputra Alluvium (AEZ 7 and 8) Greater Mymensingh and Pabna
- Ganges Alluvium (AEZ 10 and 13) Greater Faridpur and Khulna
- 300 respondents covering 20 Upazila

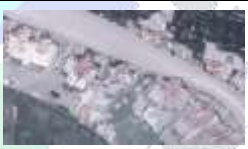
Category of respondent: Taking about 100 from each group

Disaster professionals: Disaster related professionals from GO NGO agencies.

Extension Professionals: Extension and development related professionals from GO NGO agencies.

Public representatives: Public representatives of different levels.

Characteristics the Sites on the Basis of Climate Change Evidences

			
Bhaluka AEZ 9-28	**Rang AEZ 2-3**	**Thakurgaon AEZ 1-2**	**Sariakandi AEZ 4-7**
			
Shariatpur AEZ 12	**Rampal AEZ 13**	**Sirajganj AEZ 7**	**Saraon khola AEZ 13**
			
Mohanganj AEZ 8-9	**Khulna AEZ 13**	**Mymensing 1**	**Rangpur AEZ 2-3**
			
Rajbari Pabna 10-12	**Panchagar AEZ 1-2**	**Net AEZ 8-9**	**Kaunia AEZ 2-3**
			
Madaripur AEZ 12-13	**Gopal AEZ 13-14**	**Khulna AEZ 12-13**	**Atpara 2 AEZ 9**
			
Faridpur AEZ 12	**Goforgaon AEZ 9**	**Farid AEZ 11-12**	**Gopal AEZ 12-13**
			
Chouhali AEZ 7-8	**Atpara daoga AEZ 8-9**	**Barind AEZ 25-26 din**	**Atpara AEZ 8-9**

RESULT AND DISCUSSION

The results obtained from the studies are presented and interpreted here.

Table 2: Types of Existing Disasters

Disasters	Tista Alluvium (AEZ 2.3):	Brahmaputra Alluvium (AEZ 7.8)	Ganges Alluvium (AEZ 10.13)	Mean
Cyclone	44	47	64	51.67
Flood	59	68	73	**67.00**
Drought	82	58	41	**60.33**
Hailstorm	39	44	27	37.00
Fog	75	51	43	56.00
Excess rain	63	73	42	59.00
Cold wave	84	49	28	54.00
Hot wave	61	54	36	50.00
Mean	**63.37**	**55.50**	**44.2.0**	**54.37**

The results show that: Mean response for all types of disasters in general
1. Flood scored highest as disaster event (67%) followed by drought (60%)
2. Tista Alluvium (AEZ 2. 3) scored highest as disaster prone area

Table 3: Types of Disasters that have intensive effects on livelihood

Disaster	Disaster professionals	Extension professionals	Public representatives	Mean
Cyclone	83	72	74	76.33
Flood	59	38	43	47.00
Drought	42	28	41	37.00
Hailstorm	59	56	67	61.00
Fog	53	51	45	50.00
Excess rain	63	43	62	56.00
Cold wave	64	49	48	54.00
Hot wave	31	54	36	40.00
Mean	**56.75**	**48.87**	**52.00**	**52.54**

The results show that: Mean response for **intensive types** of disasters.
1. Cyclone scored highest as disaster event (76%) followed by drought (60%)
2. Disaster professional's response scored highest as disaster prone area

Table 4: Types of disasters that have extensive effects on livelihood

Disaster	Disaster professionals	Extension professionals	Public representatives	Mean
Cyclone	63	42	54	53.00
Flood	73	54	64	64.00
Drought	72	68	81	73.66
Hailstorm	29	36	47	37.00
Fog	46	31	45	41.00
Excess rain	53	43	67	54.00
Cold wave	54	49	48	50.00
Hot wave	31	44	36	37.00
Mean	**52.62**	**45.87**	**55.25**	**51.25**

The results show that: Mean response for **extensive types** of disasters.
1. Drought scored highest as disaster event (73%) followed by flood (64%)
2. Extension professional's response scored highest as disaster prone area

Table 5: Causes of disasters affecting livelihood

Disaster	Tista Alluv	Brahm Alluv	Ganges Alluv	Mean
Temp	78	74	55	69.00
Rainfall	52	65	53	57.00
River siltation	73	81	71	**75.00**
River flow	69	57	69	65.00
Deforestation	66	42	45	51.00
Unplan dev	78	72	63	71.00
Indust Polln	33	41	36	37.00
Others	39	14	12	22.00
Mean	**61**	**55.75**	**50.50**	**55.75**

The results show that: Mean response for **major causes** of disasters.

1. River siltation scored highest as disaster event (75%) followed by unplanned development (71%).
2. The said causes were most prominent in the Tista Alluvium

Table 6: Potential main mitigation methods of disaster reduction

Technologies	Disaster professionals	Extension professionals	Public representatives	Mean
Early warning	59	53	62	58
Technology based rehabilitation	79	76	83	**79**
Environment safe physical development	72	52	56	60
Changing farming systems	69	87	69	**75**
Aforestation	66	41	61	56
Legislation for disaster risks	51	42	53	49
Climate insurance scheme	33	41	36	37
Others	19	14	22	18
Mean	**56**	**50.75**	**55.25**	**54**

The results show that: Mean response for **major mitigation** of disasters.

1. Technology based rehabilitation scored highest as disaster event (79%) followed by changing farming systems (75%).
2. The said technologies were similarly responded by all the respondent categories.

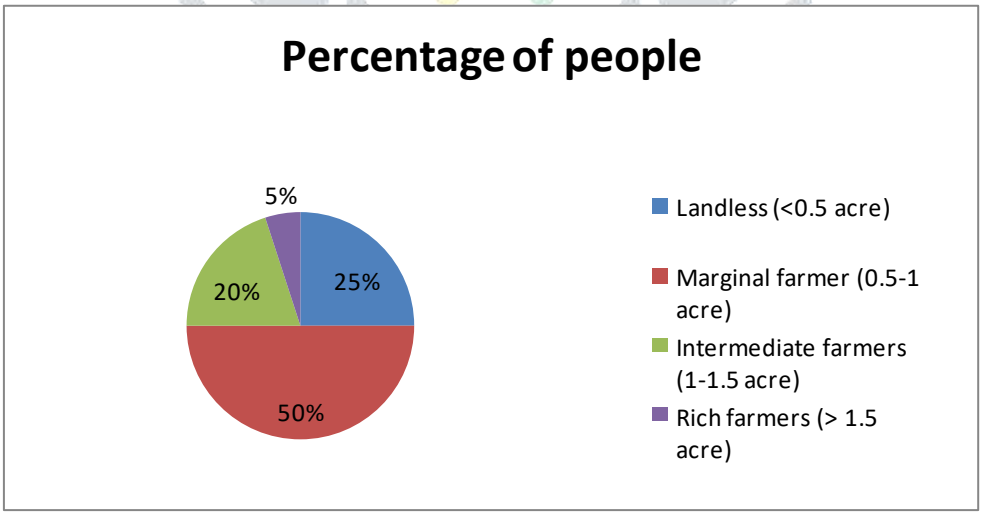


Figure 1: Percentage of People

There is no adequate information found regarding the land ownership percentage of people. According to limited information source from Upazila Parishad, it has been accounted to be 25 percent of the total people are landless in the union. Among others, 50 percent people have homestead areas, but they have less than 50 decimal of farming lands to manage sufficient household food. About 20 percent of people are intermediate farmers who possess 1-1.5 acres of land. Only 5 percent people are rich farmers in the union who possess more than 2 acres of land. The land ownership determines major economic activities in agricultural sector of the union. Majority of the people are involved with agriculture and fishing for their rudimentary livelihoods

in the area. Other than agricultural, fishing is commonly found livelihood activities for significant number of people living in the union. Fishing provides household income to few and protein food for large number of people in the union. There are also livelihood specific works (poultry and livestock) and day labors (including agriculture, fishing and earthwork), business, service and other.

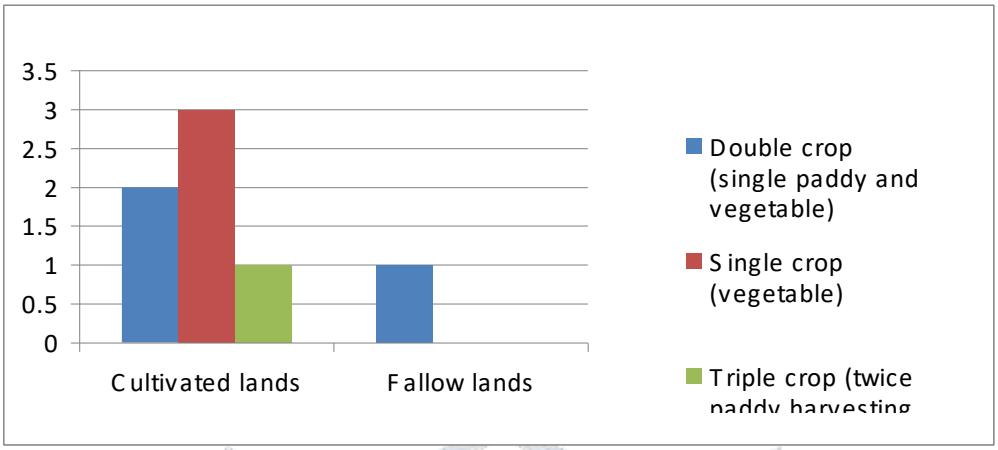


Figure 2: Land utilization and cropping pattern

The risk of climate change-induced damage to human and economic development of Bangladesh is mounting. The combined effects of sea-level rise and subsidence, changes in upstream river discharge, increased frequency and intensity of tropical cyclones, and erosion of coastal embankments pose a serious threat to the natural resource base and livelihood opportunities of coastal communities. The existing disaster management framework in Bangladesh is largely organized to deal with recurrent and rapid onset extreme events, whereas coastal zones in Bangladesh are also confronted with a range of "creeping" climate risks, such as increasing salinity trends in coastal freshwater resources, growing drainage congestions, dynamic changes in coastal morphology and a decline in the functioning of protective ecosystems. Given the general lack of institutional capacity to systematically identify and address climate-driven changes in risk patterns, the Government of Bangladesh is proposing a project to reduce the vulnerability of coastal communities to climate change-induced risks in coastal districts.

SUMMARY OF FINDINGS

Types of Existing Disaster

- Flood scored highest as disaster event (67%) followed by drought (60%)
- Tista Alluvium (AEZ 2. 3) scored highest as disaster prone area

Types of Disasters that have Intensive Effects on Livelihoods

The results show that: Mean response for **intensive types** of disasters.

1. Cyclone scored highest as disaster event (76%) followed by drought (60%)
2. Disaster professional's response scored highest as disaster prone area

Extensive Effects on Livelihoods

1. Drought scored highest as disaster event (73%) followed by flood (64%)
2. Extension professional's response scored highest as disaster prone area.

Causes of Disasters affecting Livelihood

The results show that: Mean response for **major causes** of disasters.

- River siltation scored highest as disaster event (75%) followed by unplanned development (71%).
- The said causes were most prominent in the Tista Alluvium.

Main Mitigation Methods

The results show that: Mean response for **main mitigation methods** of DR.

1. Technology based rehabilitation scored highest as disaster event (79%) followed by changing farming systems (75%).
2. The said technologies were similarly responded by all the respondent categories.

RECOMMENDATIONS

1. Early warning system to be strengthened, with active participation of community. The local NGOs direct intervention in conjunction with Local Government might be encouraged in this respect. Specific Local signaling system/early warning message dissemination procedure might be practiced in the area. Existing cross country cooperation on flood early warning systems should be strengthened.

2. The vulnerability of communities living in the most disaster prone areas need to be reduced by the construction of community-managed, women and children friendly cyclone/flood shelters with basic water and sanitation facilities.

3. The establishment of community-based, disaster resistant crops and fodder with the introduction of appropriate processing and preservation techniques.

4. New initiatives are required by existing NGOs and relevant government departments to identify alternative income-generating activities and diversified livelihood opportunities with proper DRR/CCA analysis.

5. GO and NGOs need to redesign their development programmes with the active participation of the relevant actors to ensure that they maximize hazard mitigation potential and incorporate tested traditional community coping practices. Adequate resources from government and development partners should be ensured by relevant authorities and policy makers. Mainstreaming DRR /CCA in existing development works and future initiatives of different government departments working in the area is a must.

6. Disaster Management act 2012, Standing Orders on Disasters (SOD) of the Government of Bangladesh should be understood and exercised by all concerned with appropriate resources, planning, and monitoring and accountability mechanism. Proper involvement, coordination and collaboration among different service providing agencies is must for reducing disaster risk.

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