Middle-East Journal of Scientific Research 23 (10): 2424-2428, 2015
ISSN 1990-9233

DOI: 10.5829/idosi.mejsr.2015.23.10.9665

Perception on Climate Change Impacts and Responses of People Living in a Coastal District of Bangladesh

[1]Irteja Hasan, [1]Ibrahim Khalil, [1]Ali Adnan, [2]M. Belal Hossain and [3]Mir Mohammad Ali

[1]Faculty of Disaster Management,
Patuakhali Science and Technology University, Bangladesh
[2]Department of Fisheries and Marine Science,
Noakhali Science and Technology University, Sonapur, Bangladesh
[3]Department of Aquaculture, Faculty of Fisheries,
Patuakhali Science and Technology University, Bangladesh

Abstract: The study was conducted in Kalapara upazila under Patuakhali district, a low laying deltaic coastal region of Bangladesh. Climate induced natural disasters like severe cyclone, sudden tidal surges, severe floods, uncontrolled river erosion, excessive rainfall, overwhelming salinity intrusion and sea level rise are occurring frequently along with prominent human activities. The study mainly concentrates on the perception level of the community people on climate change impacts and responses on their livelihood patterns. Both primary and secondary information was incorporated in the study. Primary information was collected through Household Survey (HHS), Focus Group Discussion (FGD), Key Informants Interview (KII) and necessary secondary information related to climate change obtained from available publications. As local people are the real victim to the climate induced disaster so their understanding about climate change vulnerability is up to mark. Peoples of the study area experiences tremendous rate of inland salinity intrusion due to frequent cyclone with storm surges and sea level rise, abnormal coastal flooding decreases land fertility that causes failure of crop production consequently leads to food insecurity. People's response to climate resilient is insufficient and in some cases absent because of poor climate knowledge, skill, lack of adaptation technology and lack of financial instrumental support. Climate resiliency should be focused on the climate education, pathways of sustainable livelihoods, climate resilient housing and climate compatible health support for the most affected people.

Key words: Climate Change · Coastal People · Perception · Impact · Response · Bangladesh

INTRODUCTION

Climate change has arisen as the greatest threat to humankind. The long term effects of climate change are possible to hinder the progress towards sustainable development and undermine the development gains. Climate change has negative impact on all aspect of human development including livelihoods, food security, safe water and sanitation, health care and shelter. Bangladesh is one of the most vulnerable countries which are facing massive challenges due to climate change. It is a low-laying flat country with big inland water bodies, including some of the biggest rivers in the world [1-8].

The coastal poor people are the most affected by the climate extremes and have very minute capacity to cope with the risks. In the foreseeable future, the country is likely to be affected by the biggest ever, long lasting and global scale human induced disaster the climate change and sea level rise [9]. The impacts of higher temperatures, more variable precipitation, more extreme weather events and sea level rise are already felt in Bangladesh and will continue to intensify [10].

Most of the climate change impacts in Bangladesh are likely to come from the southern part that is, the Bay of Bengal and the adjoining North Indian Ocean. These waters are the sources of tropical cyclones

Corresponding Author: Mir Mohammad Ali, Department of Aquaculture, Patuakhali Science and Technology University, Bangladesh. Tel: +8801911 175117.

and storm surges, coastal erosion, monsoon wind, evaporation for monsoon rainfall, floods and droughts [8].

The erratic climate change and their associated extreme events may affect ecosystems, productivity of land, agriculture, food security, water availability and quality, health and livelihood of the common people of Bangladesh. People's perception about the loss and destruction due to climate change are varied in different groups in the society. In this view, the perception about climate change vulnerability is very much desirable to understand by the people of Bangladesh who are really vulnerable due to climatic disruption [11].

This work focuses on the emerging concept of climate change vulnerability and an impression of the awareness level about climate change impacts and response of the south west coastal people of a meticulous union, Lalua of Kalapara Upazila under Patuakhali district of Bangladesh with an attempt to evaluate their weakness and strengths. The objectives of the study were to assess people's perception about climate change vulnerability that affects the livelihood pattern of the study area, to evaluate the vulnerabilities of human population due to results of climate induced changes associated with some natural hazards and to explore the adaptation approaches practiced by the selected community to cope with the climate change vulnerabilities.

MATERIALS AND METHODS

Study Area: The study area was Lalua union of Kalapara Upazila under Patuakhali district, Bangladesh. The area is selected as it is subjected to climate induced natural disasters like cyclone, river erosion, saline water intrusion, flood, tidal surges, sea level rise and manmade activities.

Primary Data Collection: The study was mainly based on primary data. Data were collected through long session of interview from January to June 2014. Both quantitative and qualitative research methods were employed to collect primary data for the study. A detailed field survey was conducted using both open and closed-ended questionnaire. By adopting quantitative research method, the study attempts to explore the local perception about frequency and intensity about different types of disasters and its impact on different sector such as housing, livelihood and economy and so on. For qualitative research, this study employed field observation and focus group discussion to get socio-demographic characteristics, livestock loss and biodiversity, stability distribution in the study. The interview session was carried out into Bangla language. Because most of the respondents are illiterate and they expressed their experience by Bangla language which translated into English.

Secondary Data Collection: Demographic information was obtained from Bangladesh Bureau of Statistics, population census 2011 [12]. Besides that other necessary data and information were collected from Kalapara Upazila office; Lalua union parisad and also from relevant published articles.

RESULTS AND DISCUSSION

Socio-demographic Characteristics: Socio-demographic status is needed for understanding slow onset vulnerability condition resulting from various climatic problems with its future impact assessment. Socio-demographic characteristics of respondents in the study area are summarized in the Table 1.

People's Perception about Different Climatic Problems: Measuring people's perception level is an important tool for the study about climate change variability and to cope with the climatic disruption is necessary to gain a clear conception about the various climatic events. There were various climatic changes that affect the overall livelihood pattern of the selected community. The perception level on different climatic events is shown in Table 2.

Assessment of Climate Change Vulnerability of Human Population: Warmer and wetter condition could increase the potential for higher incidence of vector-borne and water borne diseases. Lands are frequently flooded by heavy rainfall, spill of river channels, sea surges associated with cyclone and various disasters are relatively common phenomena. Evaluation of resulted various climatic events vulnerabilities are presented in Table 3.

Vulnerability Effect at Community Level

Perceived Effects of Different Climatic Events: From the survey it was found that crop damage, reduced income, communication breakdown, drinking water problem, sanitation problem are common phenomena due to various climatic events in the study area. The perceived effects that are resembled to each other are varied in intensity and severity on the basis of diverse climatic problems.

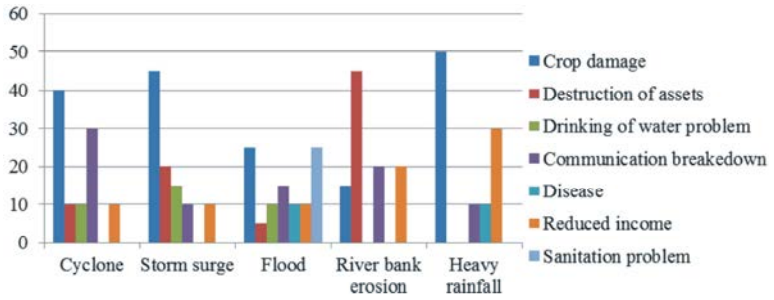

Fig. 1: Perceived effects of different Climatic Events

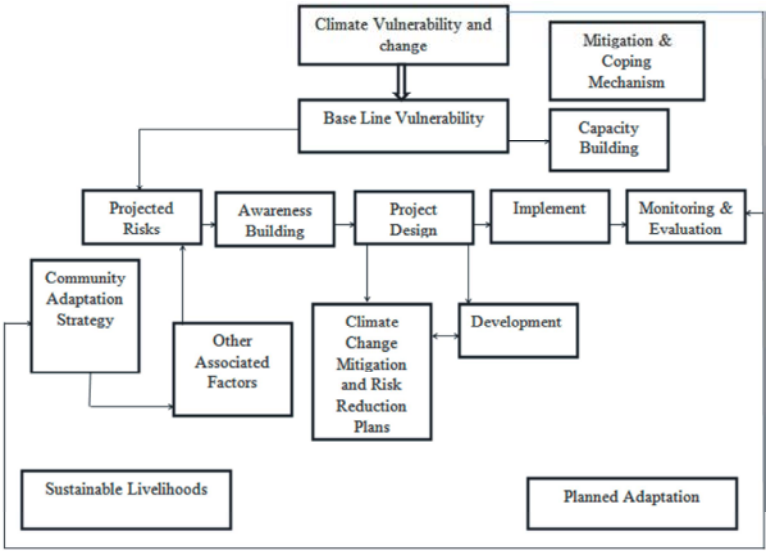

Fig. 2: A conceptual Model for the Climate Change Vulnerability Reduction and Adaptation in the study area (Modified from the model of Development Risk Reduction by CDMP).

Table 1: Characteristics profile of the respondents for understanding the climate change perception

		Respondents	
Variables	Sub-variables	Number	Percentage
Age	Young (21-35)	13	26
	Middle (36-50)	25	50
	Old (>50)	12	24
Sex	Male	27	54
	Female	23	46
Level of Education	Illiterate	16	32
	Primary	19	38
	Secondary	9	18
	Tertiary	6	12
Occupation	Agriculture	22	44
	Business	11	22
	Jobs	9	18
	Others	8	16
Farm Size	Landless	9	18
	Marginal	13	26
	Small	18	36
	Medium	20	40

Table 2: Perception level of the respondents about different climatic problems

Problem	Respondents (%) N= 50	Frequency per year	Perception level (%)
Cyclone	100	4~5 times	86 (n=43)
Tidal Surge	100	3~5 times	70 (n=35)
River Erosion	100	Throughout the year	80 (n=40)
Floods	100	2~4 times	56 (n=28)
Heavy Rainfall	100	3~4 times	48 (n=24)
Salinity Intrusion	100	Throughout the year	76 (n=38)
Water Born Disease	100	Throughout the year	44 (n=22)

Note: (%) indicate percentage of respondent perception level, N= Total no. of respondent surveyed (50),
n= no. of respondent perceive about different climatic problems.

Table 3: Problem ranking and frequency of the study area

			Ranking problem based on vulnerability		
Climatic problem	Respondent (%)	Frequency per year	High (%)	Medium (%)	Low (%)
Cyclone	100	4-5 times	80	20	0
Storm surge	40	3-5 times	68	32	0
River bank erosion	90	Throughout the years	87	10	3
Floods	95	2-4 times	67	33	0
Heavy rainfall	74	3-4 times	33	40	27
salinity intrusion	100	Throughout the years	100	0	0
Water borne disease	65	Throughout the years	30	40	30

Table 4: The vulnerability contexts versus well-being ranking of the projected village community

Climatic problem	Respondent (%)	House	Occupation	Income	Wealth
Cyclone	100	***	**	***	***
Storm surge	40	***	**	***	***
River bank erosion	90	***	*	*	**
Floods	95	**	**	**	**
Heavy rainfall	74	*	0	*	*
salinity intrusion	100	0	**	**	*
Water borne disease	65	0	0	*	**

Notes: 0= No vulnerable, *= slightly vulnerable, **= moderately vulnerable, ***= Severe Vulnerable

Table 5: Most Practiced Coping and Adaptation strategies of the study area

Vulnerability Context (%)	Seasonal Migration (%)	Rain water use (%)	Save rice or food (%)	High elevated mud wall with bamboo (%)	Taking Relief Assistance (%)	Repair houses (%)	Gross a loan to continue livelihoods (%)	Use potash alum (%)	Boil water (%)	Stay in houses (%)	Govt. NGOs (%)
Cyclone	46 n=23		70 n=35		84 n=42	76 n=38	48 n=24			18 n=9	54 n=27
Storm Surge	32 n=16		48 n=24		54 n=27	72 n=36	52 n=26			34 n=17	22 n=11
Flood	30 n=15			42 n=21	28 n=14	82 n=41	38 n=19				
River Erosion	88 n=44		36 n=18	42 n=21		76 n=38	58 n=29				26 n=13
Heavy Rainfall				44 n=22		68 n=34	26 n=13				
Salinity Intrusion		18 n= 9					32 n=16	54 n=28			22 n=11
Water Borne Diseases		24 n= 12						48 n=24	62 n=31		30 n=15

Notes: (%) indicates percentage of population adapted with the vulnerability contexts.
N= Total no. of respondents, n= no. of respondent adapted by specific adaptation strategy.

Adaptation Strategies Practiced by the Community

Conceptual Model for the Climate Change Vulnerability Reduction and Adaptation: Conceptual model for the adaptation with climate change vulnerability mainly promotes defining and redefining risks incorporating technical knowledge, impacts of climate change analyzing vulnerability and risks factors focusing all hazards, all risks and all sectors.

CONCLUSION

It is concluded that cyclone, cyclonic storm surge and river bank erosion is the utmost vulnerable climate induced disasters than others in the study area. The study unfolded impact of those climatic event mainly that decreases agriculture production leading to food insecurity, reduced income level of people, damaged transportation system, increasing the rate of migration as well as the livelihood insecurity. The study also revealed that most practiced coping and adaptation strategies by the people of the projected area as use of rainwater for drinking or household purpose, build high elevated mud wall for protecting basement of house from cyclone induced storm surge water, usually taking action to retrofitting their house for making more resilient against disasters. They have built shelter friendly embankment to save flash flood affected people for long time flood management, taking loan from different organizations and also receiving assistance from Government and NGO's for coping and adapting with the adverse effects of climate change impact.

REFERENCES

1. Ali, M.M., M.B. Hossain, M.H. Minar, S. Rahman and M.S. Islam, 2014a. Socio-Economic Aspects of the Fishermen of Lohalia River, Bangladesh. Middle-East Journal of Scientific Research, 19(2): 191-195.
2. Ali, M.M., M.B. Hossain, M.A. Rahman and A. Habib, 2014b. Diversity of Fish Fauna in the Chitra River of Southwestern Bangladesh: Present Status, Threats and Recommendations for Conservation. Asian Journal of Applied Sciences, 7(7): 635-643.
3. Ali, M.M., M.B. Hossain, M. Rahman and S. Rahman. 2014c. Post Stocking Management Practices by the Pond Fish Farmers in Barisal District, Bangladesh. Global Veterinaria, 13(2): 196-201.
4. Ali, M.M., B.C. Das, S.M.A. Islam, M.A. Masud and M.Z. Rahman, 2014d. Fishing Gears and Crafts Used by the Fishers at Lohalia River in Patuakhali. Journal of Environmental Science & Natural Resources, 7(2): 169-175.
5. Ali, M.M., M.M. Rahman, M.Y. Hossain, M.Z. Rahman, M.A. Hossen, S.M.A. Naser, R. Islam, B.R. Subba, Z. Masood and M.A. Hoque, 2014e. Fish Marketing System in Southern Bangladesh: Recommendations for Efficient Marketing. Our Nature, 12(1): 28-36.
6. Ali, M.M., M.A. Rahman, M.B. Hossain and M.Z. Rahman, 2014f. Aquaculture Drugs Used for Fish and Shellfish Health Management in the Southwestern Bangladesh. Asian Journal of Biological Sciences, 7(5): 225-232.
7. Ali, M.M., M.B. Hossain, M.A. Masud and M.A.W. Alam, 2015a. Fish Species Availability and Fishing Gears Used in the Ramnabad River, Southern Bangladesh. Asian Journal of Agricultural Research, 9(1): 12-22.
8. Ali, A., 1999. Climate change impacts and adaptation assessment in Bangladesh. Climate Research, 12: 109-116.
9. Uddin, M.S., 2011. Climate change and salinity in Bangladesh: Constraints and management strategy for crop production. Rajshahi University Journal of Environmental Science, 1: 13-20.
10. Shikder, M.T., 2010. The Impacts of Climate Change on the Coastal Belt of Bangladesh: An Investigation of Risks & Adaptations on Agricultural Sector. Proc. of International Conference on Environmental Aspects of Bangladesh (ICEAB10), Japan, Sept. 2010.
11. C.C.C., 2008. Reducing Development Risk in a Changing. U.K. Climate Change Conference. Dhaka, Bangladesh, Climate Change Cell.
12. BBS, 2011. Bangladesh population Census, Zila: Patuakhali. Bangladesh Bureau of Statistics. Statistical Division, Ministry of Planning. Government of the People's Republic of Bangladesh.