

CLIMATE CHANGE: A STUDY ON IMPACT AND PEOPLE'S PERCEPTION (A CASE STUDY ON MONGLA UPAZILA, BAGERHAT DISTRICT, BANGLADESH)

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Abstract

Climate induced changes such as severe cyclone, shocking tidal surges, severe floods, underhanded river erosion, excessive rainfall, overwhelming salinity intrusion etc, are occurring more frequently in greater intensities and in an impulsive manner approximately the world including Bangladesh. To perceive the vulnerability, the south western coastal Bangladesh is selected as a delve into area where high vulnerability to natural climate is due to its low lying deltaic floodplain landscape. The research mainly focuses on the discernment level of the community's people on climate change vulnerability and its impact on their livelihood patterns. Peoples of the affected area experienced that unequal rate of salinity intrusion into the land mass increased less fertility that causes failure of crop production. As an importance, most of the low income families are now facing food insecurity and a huge amount of potable water crisis that makes the people more vulnerable along with a threat of different water borne diseases.

Key words: Climate Change, Vulnerability, People's Perception

Introduction

Climate change is considered as one of the most serious threats to the world's environment with its potential negative aspects on human health, food security, agriculture, fisheries, biodiversity, water, economic activities and other natural resources. The global warming is apprehended to lead a higher atmospheric temperature, high intensity of rainfall, increased natural disasters, more frequent and prolonged draughts and sea level rise along the coastal areas of low lying Bangladesh (NCSA, 2007).

It is well recognized both in the scientific and negotiating community that Bangladesh would be one of the most adversely affected country to climate change. Low economic strength, inadequate infrastructure, low level of social development, lack of institutional capacity, and a higher dependency on the natural resource base make the country more vulnerable to climate stimuli including both variability as well as extreme events (NAPA, 2005).

People's perception about mentioned types of loss and destruction are different among different groups in the society, coastal peoples of Bangladesh are the real victim to the climate induced disasters. In this view, the perception

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about climate change vulnerability is very much desirable to understand by the people of Bangladesh who are really vulnerable due to climatic disruption (CCC, 2008).

The lessons provide an impression of the awareness level about climate change vulnerability of the south west coastal people of a meticulous village, East Chila of Mongla upazila under Bagerhat districts of Bangladesh with an attempt to the evaluation of their weakness. (Kelly, 1999). Throughout the vulnerability assessment, the well-being indicators that were tried to identify different stakeholder groups, such as income, food, potable water, health and personal safety, housing and safety of property etc are being considered as important. (Kasem, 2008)

Objectives

1. To assess people's perception about climate change vulnerability that affects the livelihood pattern of the study area.
2. To evaluate the vulnerabilities of human populations due to results of climate induced changes associated with some natural hazards.
3. To explore the adaptation approaches practiced by the selected community to cope with the climate change vulnerabilities.

Methodology

Conceptualization

It means developing clear understanding about what is intended to do in the study. This is done by:

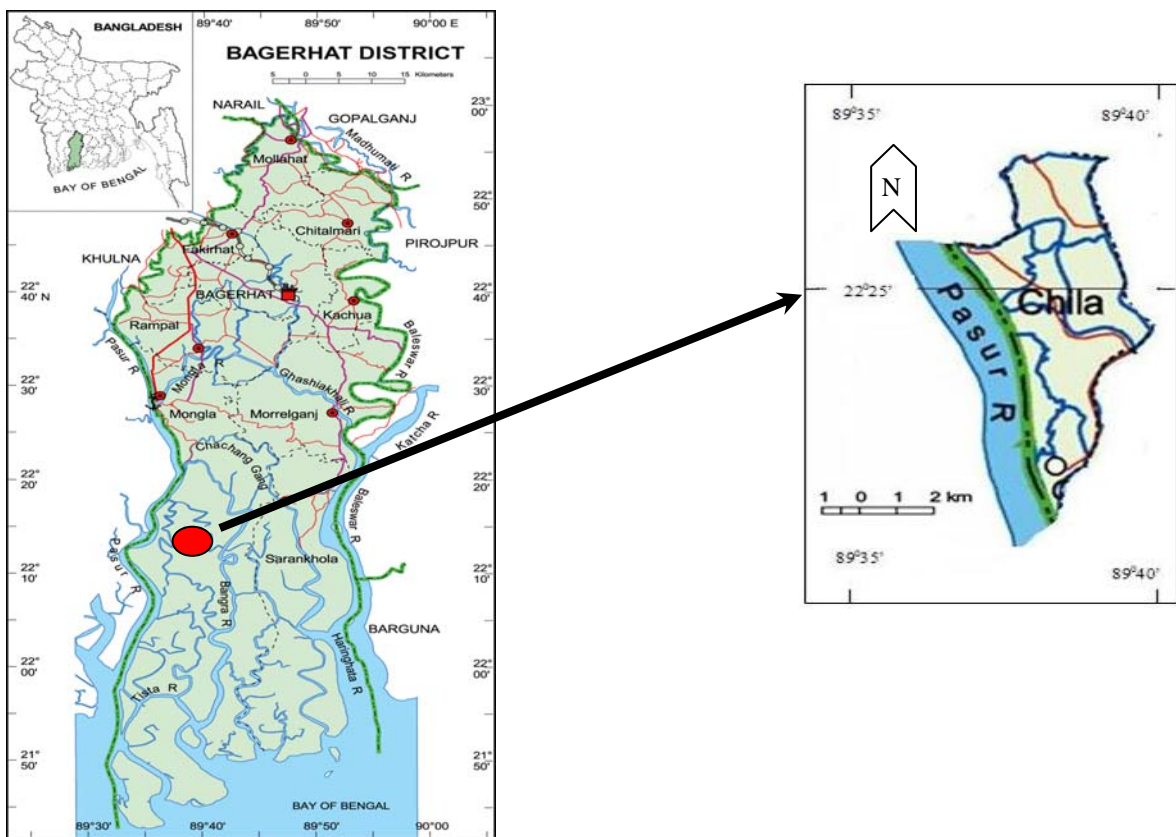
1. Communication with resource persons
2. Literature survey

By communicating with the resource persons and studying different journals, books, seminar papers, reports, magazines, review papers etc. which focus on the issue related to the research topic, a clear concept about different aspects of the research were developed.

Selection of the Study Area

The main impacts of the climate change have been faced by the coastal zone due to its vulnerability over various coastal resources. (Alam, 2003) The study area is located, village East Chila under Chila Union of Mongla Upazila under Bagerhat District, Bangladesh. As it is a coastal region, as well as impact zone of Sundarbans, climate induced natural disaster like cyclone, river erosion, saline water intrusion, flood, tidal surges and sea level rise and man made activities are prominent feature of the study area. Another way, human induced shrimp farming initiates salinity which seriously affects the agricultural production, and makes this region vulnerable to safe potable water.

Map of the Study Area with Respect to Bangladesh



The villagers who are above 40 years of age group were selected as the major respondent group because they were more knowledgeable about the study area and with the topic of the study. During the field survey more emphasize were given to the educated people because they were more skilled and knowledgeable about the topic of the study. Questionnaire was designed and pre tested that the objectives can be achieved conveniently. After pre testing, some issues may be rejected or added and some may be modified. Thus the questionnaire was given in final form.

Secondary Data Collection

Demographic information was obtained from Bangladesh Bureau of Statistics: Population census 2001. (BBS, 2001) Community series, Zila Bagerhat. Social information from Mongla Upazilla Parishad office, Mongla, Bagerhat. Journals and papers relevant to the study from Environmental Science Discipline Seminar Library, Khulna University and Khulna University Central library and Websites.

Sampling design: Random sampling method was used for the household survey, which represent 30% household of the total population.

Result and discussion

People's Perception Level about Various Climatic Problems

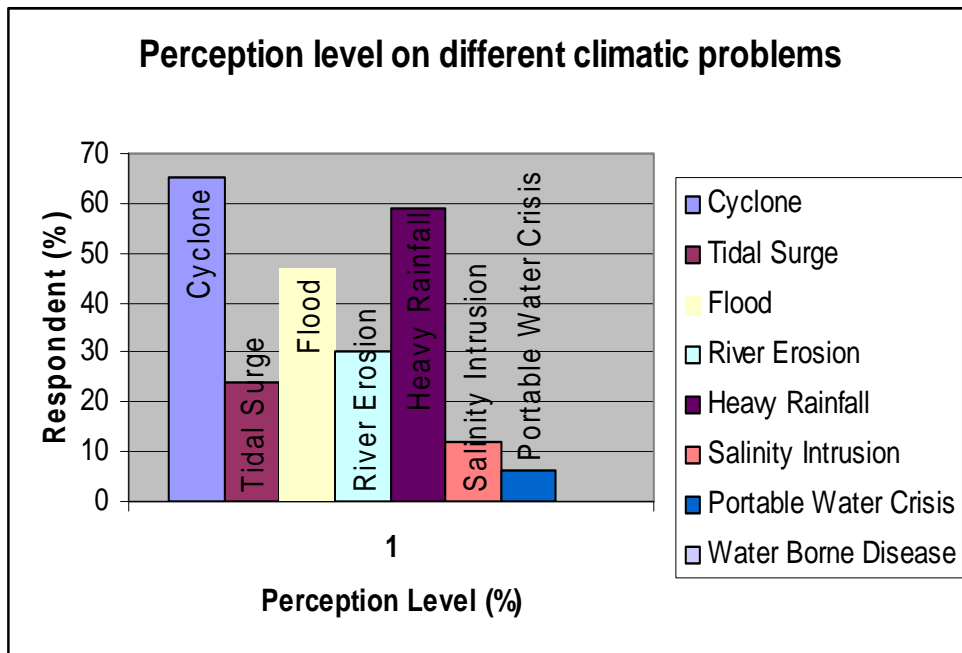
Measuring people's perception level is inevitable for the study about climate change variability and to cope with the climatic disruption it must be necessary to gain a clear conception about the various climatic events. There were various climatic changes that affect the overall livelihood pattern of the selected community. This is very much crucial for the selected community to recognize the adverse climatic impacts. The perception level on different climatic events is shown by the table1.

Table1. Perception level of the selected respondent on different climatic problems

Problem	Respondent (%) (N=17)	Frequency per year	Perception level (%)
Cyclone	100	3~5 times	65 (n=11)
Tidal Surge	100	2~3 times	24 (n=4)
Floods	100	2~4 times	47 (n=8)
River Erosion	100	Throughout the year	30 (n=5)
Heavy Rainfall	100	2~5 times	59 (n=10)
Salinity Intrusion	100	Throughout the year	12 (n=2)
Potable Water Crisis	100	Throughout the year	6 (n=1)
Water Borne Disease	100	Throughout the year	0 (n=0)

Source: Field Survey, 2008.

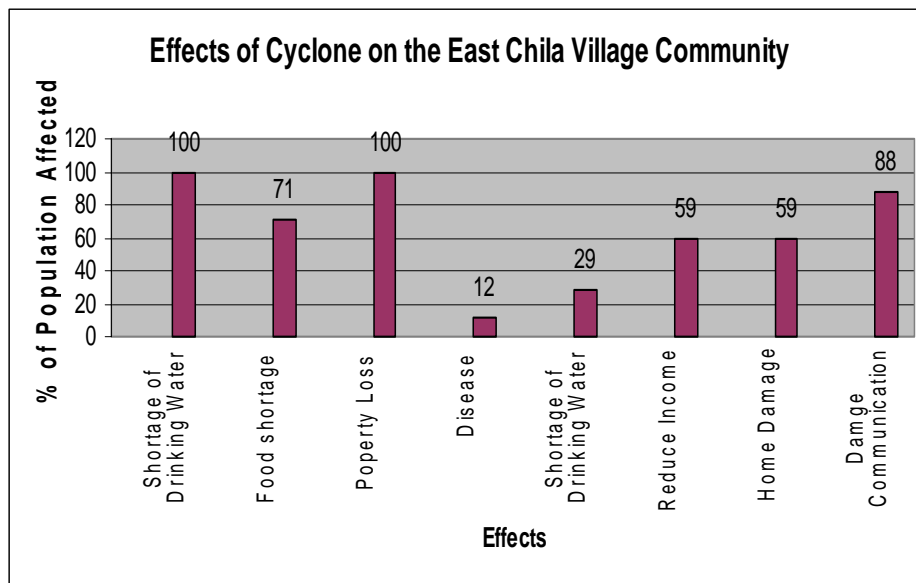
Notes: (%) Indicate percentage of respondent perception level, N= Total no. of household surveyed (17), n= No. of respondent perceive about different climatic problems



Source: Field Survey, 2008

Perception about the Cyclone and Tidal Surge

The people of the village East Chila under the Chila Union Parishad of Bagerhat district are facing cyclone as a common problem of climate change and thus the perception level of this climatic event is poses the highest rank and it is 65%. On the other hand the perception level about tidal surges is 24%, which is lower in compare than cyclone due to its less stirring on the community.

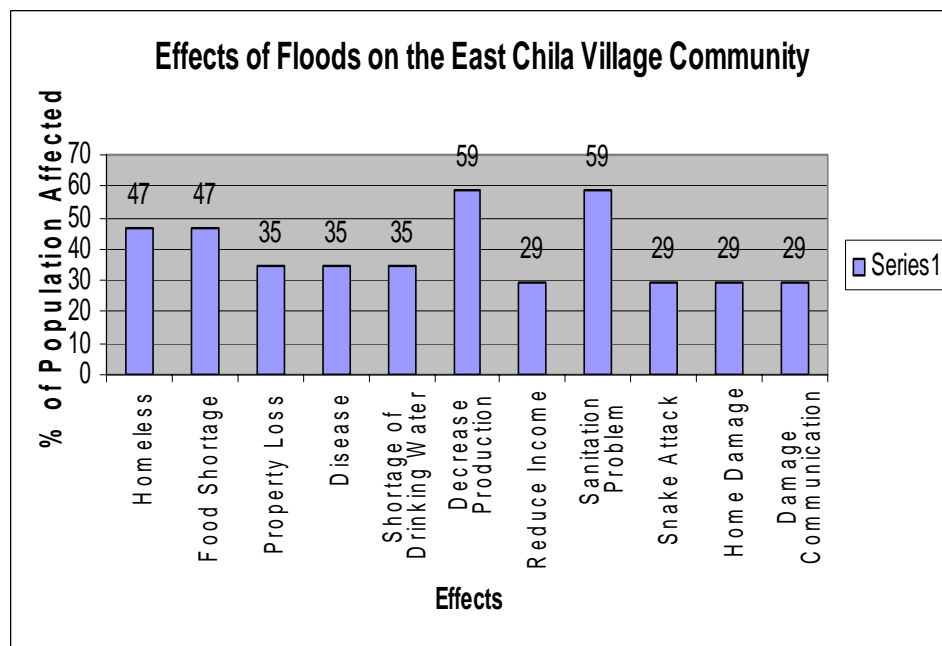


Source: Field Survey, 2008

Cyclone has devastating effect on the communities which also make their lives vulnerable. The effect of cyclone and tidal surge on the village community are shown in the figure.

Perception about the Floods

The climate impacts result not only from gradual changes in temperature and sea level but also, in particular, from increased climate variability and extremes, including more intense floods, droughts, and storms. But it's a matter of sorrow that most of the people have no idea why the floods are happening more and more frequently in recent years. The perception level of flood as a phenomenon of climate change of the selected community is 47%.

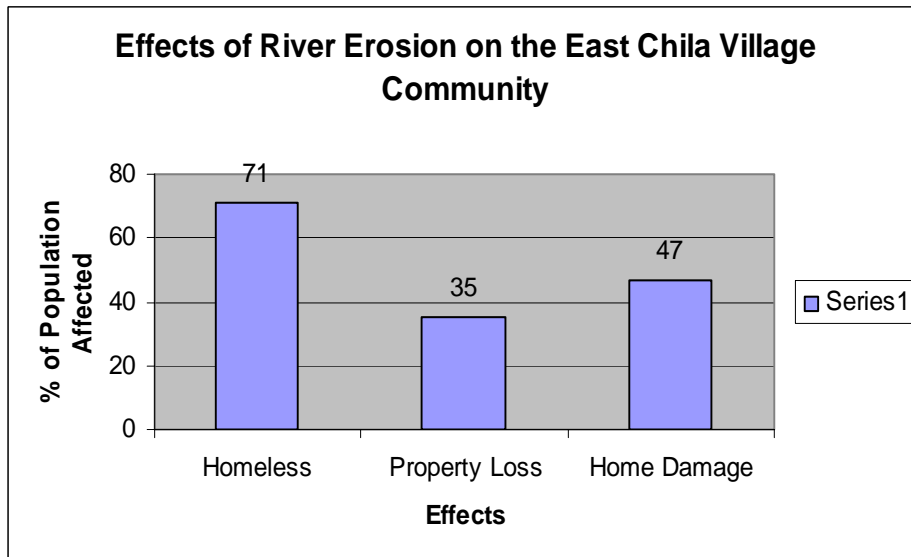


Source: Field Survey, 2008

Floods cause 47% population as homeless and the same amount possess the problem of food shortage. 35% of peoples are affected by property loss, disease and shortage of drinking water. 59% of population faces the problem of decrease production and unhealthy sanitation.

Perception about the River Erosion

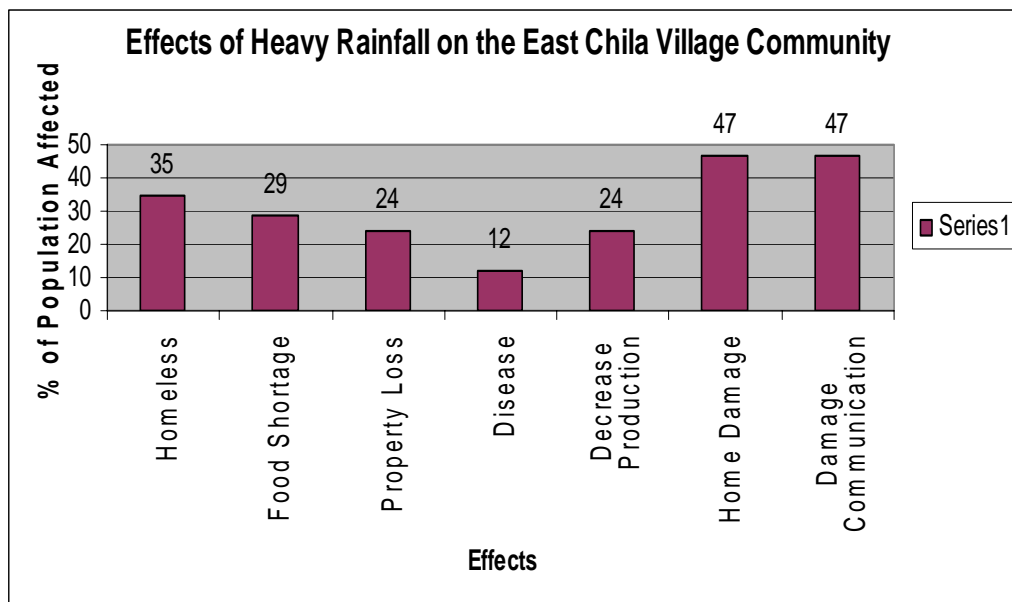
The consequences are saltwater intrusion into surface and groundwater systems, drainage congestion and water logging, and changes in morphodynamic processes resulting in increased riverbank erosion. River bank erosion is a very common and serious problem to the peoples of the village East Chila under Bagerhat district. The perception level of river bank erosion related to the results of climate change poses 30%.



Source: Field Survey, 2008

Perception about the Heavy Rainfall

The frequency of heavy rainfall is 2~5 times over the study area and the perception level about heavy rainfall is quite higher than other climatic events such as river erosion, salinity intrusion, portable water crises etc and it is 59%.



Source: Field Survey, 2008

Heavy rainfall results 35% of population as homeless, 29% of population has the problem of food shortage, property loss of about 24% and 12% disease problem, decrease production of people is about 24%, 47% of population face the problem of home damage and damage communication

Perception about the Salinity Intrusion

The perception level of salinity intrusion due to the result of climate change is 12% but this problem disturbs the selected community throughout the year. Due to intensive salinity intrusion in the study area, the agricultural land becomes less fertile and causing changes of occupation.

Perception about the Potable Water Crisis

The perception level about the crisis of portable water in this village community is about 6% and it arises through the concept of heavy rainfall as a climatic problems.

Assessment of climate change vulnerability

The study area is also vulnerable to many climate induced vulnerabilities such as infectious diseases. 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 disaster are relatively common phenomena.

Table2. Problem Ranking and Frequency of the Village East Chila

Climatic Problem	Respondent (%)	Frequency per year	Ranking Problem Based on Vulnerabilities		
			High (%)	Medium (%)	Low (%)
Cyclone	100	3~5 times	71	29	0
Tidal Surge	35	2~3 times	67	23	0
Floods	59	2~4 times	60	40	40
River Erosion	100	Throughout the year	100	0	0
Heavy Rainfall	71	2~5 times	17	50	33
Salinity Intrusion	100	Throughout the year	100	0	0
Portable Water Crisis	100	Throughout the year	100	0	0
Water Borne Disease	47	Throughout the year	50	25	25

Source: Field Survey, 2008.

Vulnerability Effect on the Community level

Livelihoods are vulnerable when they are unable to cope with respond to risk, stress, and shock and it is primarily a function of "a household's assets endowment and of the characteristics of the shocks. According to the field survey, the vulnerability context that is identified by the communities of the study area creates several threats on their lives, property, settlements and livelihood patterns.

Table3. The Vulnerability contexts Versus Well- being ranking of the Projected Village Community

Vulnerability Contexts	Respondent (%)	House	Occupation	Income	Wealth
Cyclone	100	+++	++	+++	+++
Tidal Surge	35	+++	++	++	+++
Floods	59	+++	+	++	++
River Erosion	100	+++	+	+	+
Heavy Rainfall	71	++	0	+	+
Salinity Intrusion	100	0	+++	+	+
Portable Water Crisis	100	0	0	+	+
Water Borne Disease	47	0	0	++	++

Source: Field Survey, 2008.

Notes: 0 = No vulnerable, + = slightly vulnerable, ++ = moderately vulnerable, +++ = Severe vulnerable.

The East Chila village community people identified the well-being indicator of life is house, occupation, income and wealth. The vulnerability contexts well-being ranking is assessed on the basis of percentage of the respondent of as the community people identifies how severe the impacts of vulnerability contexts on the well-being of human life and their socio-economic status.

Table4. Coping Adaptation Strategy of East Chila Village Community

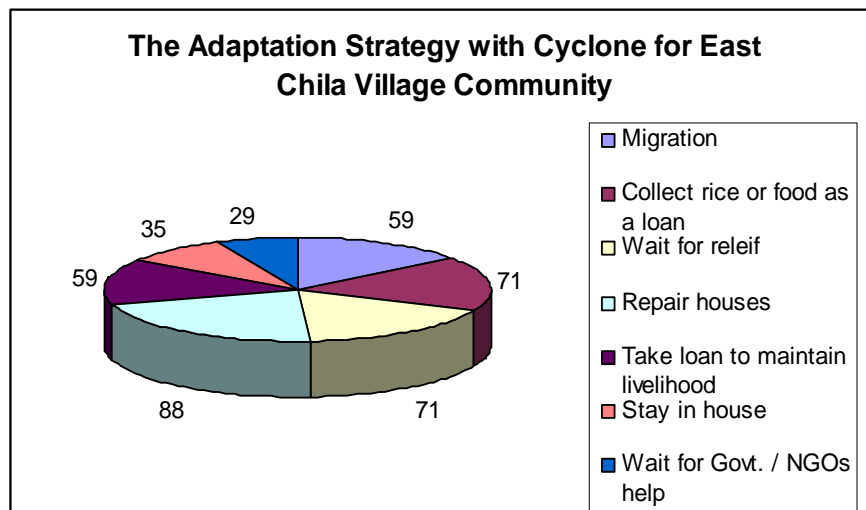
Vulnerability contexts	Migration (%)	Drink/ use rain water (%)	Collect rice or food as a loan (%)	High mud wall with bamboo (%)	Wait for relief (%)	Repair houses (%)	Take loan to maintain livelihood (%)	Lease out resources or land (%)	Use potash alum (%)	Boil water (%)	Take oral saline (%)	Stay in house (%)	Govt. /NGOs (%)
Cyclone	59 (n=10)		71 (n=12)		71 (n=12)	88 (n=15)	59 (n=10)					35 (n=6)	29 (n=5)
Tidal Surge	29 (n=5)		41 (n=7)		35 (n=6)	71 (n=12)	35 (n=6)					59 (n=10)	29 (n=5)
Floods	47 (n=8)			12 (n=2)	12 (n=2)	71 (n=12)	29 (n=5)						
River Erosion	88 (n=15)		35 (n=6)	29 (n=5)		88 (n=15)	41 (n=7)	12 (n=2)					18 (n=3)
Heavy Rainfall				41 (n=7)		71 (n=12)	12 (n=2)						
Salinity Intrusion		18 (n=3)					47 (n=8)		35 (n=6)				24 (n=4)
Portable Water Crisis		41 (n=7)							59 (n=10)	47 (n=8)			47 (n=8)

Source: Field survey, 2008

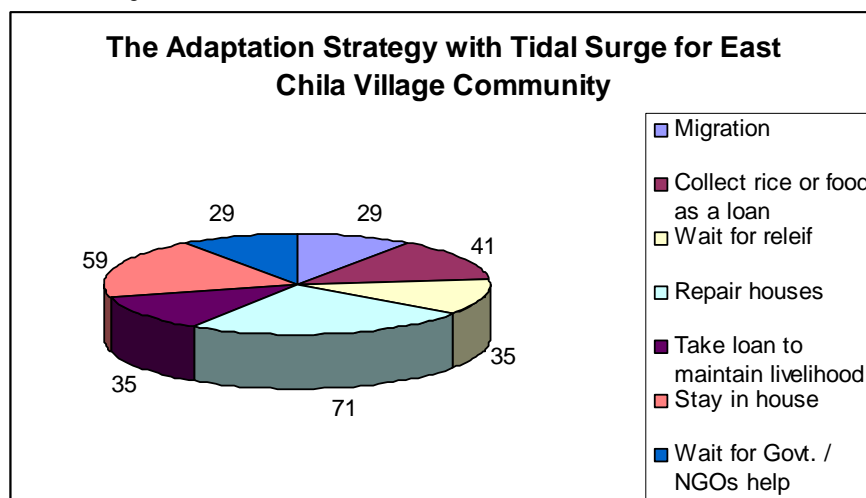
Notes: % Indicates Percentage of Population Adapted with the Vulnerability Contexts.

N= Total no. of Household Surveyed (17)

n = No. of Respondent Adapted by Specific Adaptation Strategy.



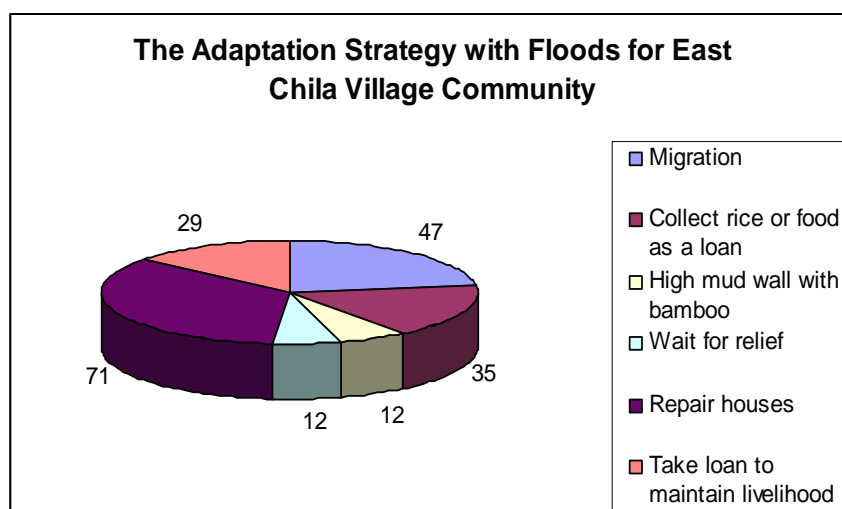
Source: Field Survey, 2008



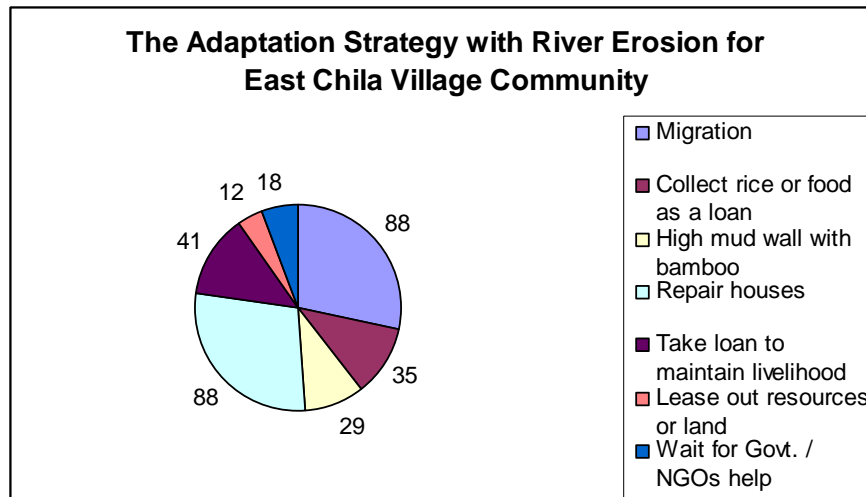
Source: Field Survey, 2008

Adaptation with Floods

In the East Chila village community, peoples are adapted with floods; about 47% migrates to other place to save the lives, about 35% people collect rice or food as a loan, about 12% people o this village community adapted with flood by builds their house high mud wall with bamboo and waits for relief, 71% people are adapted with repairing their houses, 29% people take loan to maintain their livelihood.

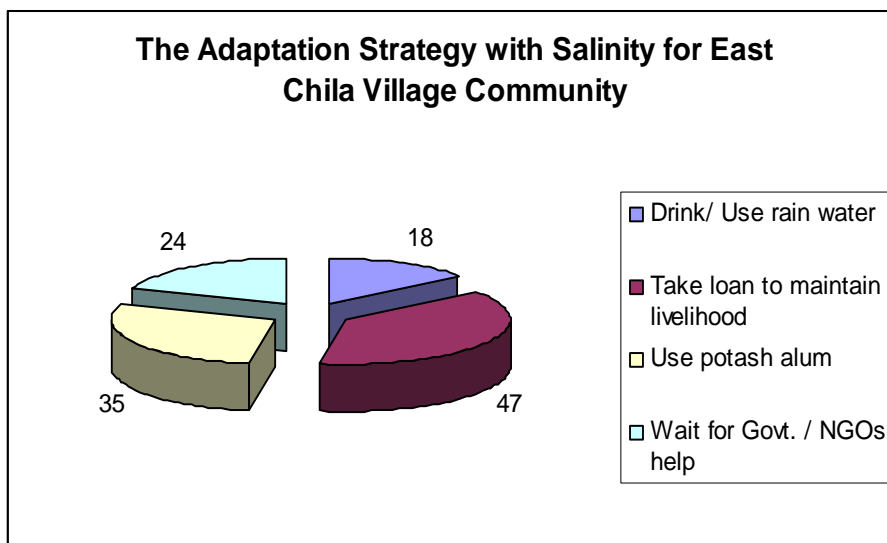


Source: Field Survey, 2008



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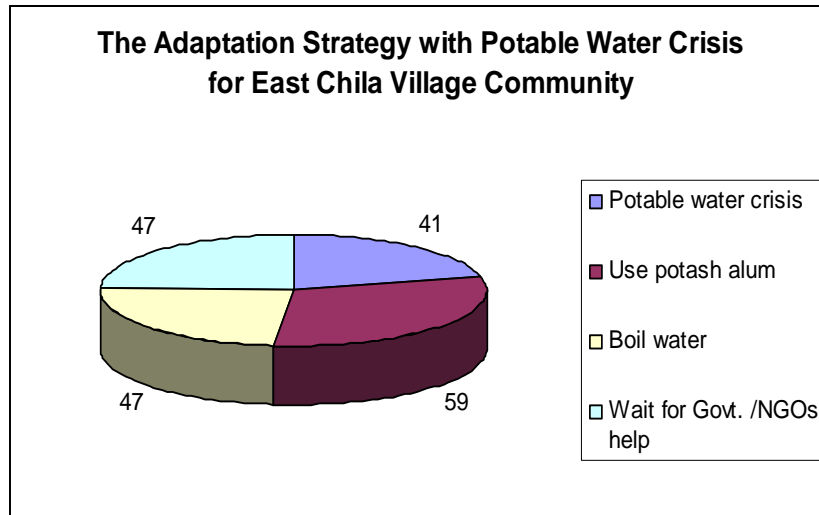
The East Chila village community adapted with river erosion through 88% of people has been migrated; about 35% of people collect rice or food as a loan, 29% people made their houses by high mud wall with bamboo, 88% of people repair their houses in a safe place, 41% of people take loan to maintain their livelihood, 12% people lease out resources or land and 18% people of the community wait for Govt. /NGOs help.



Source: Field Survey, 2008

The people of this community use pond water as their daily needs and drinking purposes but due to high level of salinity intrusion all the pond water will be deteriorated within some days. In the East Chila village community the adaptation strategy with salinity is found that 18% people use/ drink rain water to meet their demands, 47% people take loan to maintain their livelihood, about 35% people use potash alum to purify the saline water and 24% of population wait for Govt. / NGOs help.

Adaptation for Potable Water Crisis

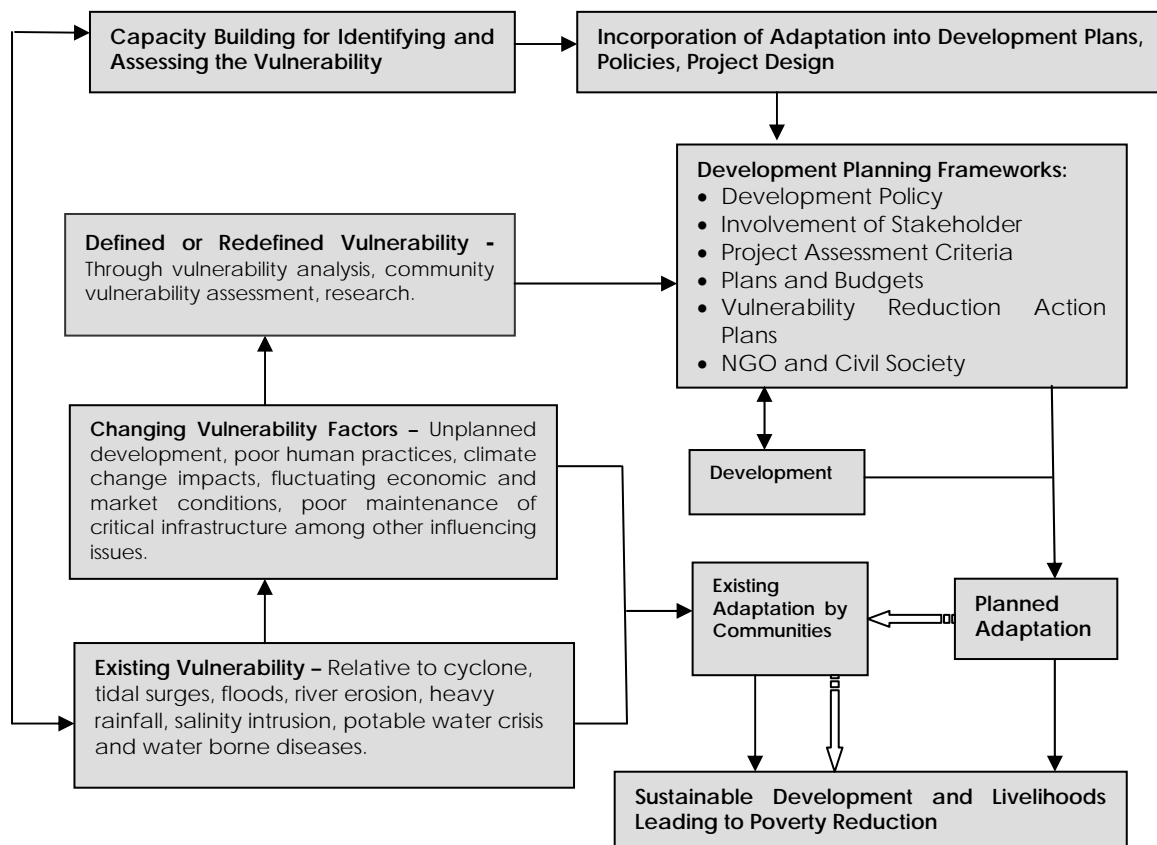


Source: Field Survey, 2008

In the East Chila village community the adaptation strategies with potable water crisis, about 41% people use / drink rain water, 59% people use potash alum, 47% people boil water for drinking purposes and 47% people wait for Govt. /NGOs help

Conceptual Model for the Adaptation with Climate Change Vulnerability

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.



A Conceptual Model for the Adaptation with Climate Change Vulnerability in the Study Area (Modified from the model of Development Risk Reduction by CDMP).

Conclusion

The study findings again proved this vulnerability to climate change. The local people of selected village East Chila under Mongla upazila, Bagerhat District perceived this climate change impact as “we are in vulnerable to disaster like cyclone, salinity intrusion, river bank erosion, safe drinking water supply and food production systems.” They are suffering again and again since last century and locally adapted themselves with low-cost available indigenous technologies with their limited resources. But they are unable to adapt with recently happened SDR like disaster and future possible calamities like cyclone, big tidal surge and others, due to the peoples are poor- unable to adapt with big change. The future changes needs more adaptable infrastructure with the improvement of their socio-economic capability. And it needs supports from the government or other organizations like NGOs, CBOs.

Acknowledgement

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