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Water Logging in Keshabpur: A Focus to the Coping Strategies of the People

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Abstract— Water logging has been disrupting livelihoods of about one million people in Bangladesh during past two decades. South-west Bangladesh is prone to water logging due to the vulnerable geographical setting and climate change. The worst hydro-geophysical vulnerability has been found in Keshabpur Thana of Jessore District where most of the land is waterlogged for over seven years. The researchers tried to identify people's unique coping strategies under such adverse environmental condition. Necessary data were collected through questionnaire survey, Focus Group Discussions (FGD) and Participatory Vulnerability Assessment (PVA) tools. About 270 households of the study area were surveyed. Major findings revealed the constraints towards reducing people's vulnerability such as climate change, poor coordination among stakeholders, limited institutional initiative of coping etc. Accordingly researchers tried to put some necessary recommendation such as promoting agricultural and institutional coping immediately in the study area.

INTRODUCTION

Bangladesh is known as one of the most vulnerable countries across the globe under climate change. The water resources sector of the country would most likely be affected significantly due to anticipated changes [1], [2]. Most of the adverse effects of climate change will be in the form of extreme weather events, while water-related hazards such as flood and water logging are likely to be exacerbated [3]-[5].

The present study has been conducted in Keshabpur Thana of Jessore District due to its high vulnerability to water logging for last seven years. Almost eight months in a year most of the area is inundated. The total area of Keshabpur Thana is about 258.53 sq km. The region is located in the coastal zone, and is significantly influenced by tidal effects. The region is monotonously flat, having low elevation. According to available statistics on coastal zone, majority of the land is within one meter from mean sea level, a significant proportion of which again falls below high-tide level [6].

Both human interruptions upon nature and climate change are responsible for the water logging problem in South-West Bangladesh. From geographical perspective, Keshabpur thana of Jessore District is located in Kabodak River catchments. Historically the Kabodak River has been affected by regional and political decision which was, in most cases, detrimental to the hydrological condition of the region. As a result, the Kabodak soon lost its flowing capacity due to sedimentation. Due to the siltation of the Kabodak River, three unions in the western part of Keshabpur are affected: Trimohini, Sagardari and Bidyanandakathi. The coastal embankment project, Farakka barrage etc. accelerated the process of sedimentation of River Kabodak flowing towards west of Keshabpur. Hence, the water inundated the riverside areas.

At present, the problem of Kabodak's siltation is severe than any other previous problems. Unfortunately, climate change will exacerbate the problem very soon.

OBJECTIVES AND SCOPE OF THE RESEARCH

The main objective of the research was to identify local people's coping strategies in waterlogged condition and thereby identify the constraints towards reducing people's vulnerability. Coping in general has been discussed in several researches but in this research coping has been analyzed from two different perspectives namely indigenous and institutional coping. Also judging the effectiveness of different projects from poor people's perspectives is another new area where people had a scope to criticize as well as appreciate different institutional efforts.

DEMOGRAPHIC STATISTICS OF THE STUDY AREA AND THE METHODOLOGY

Population in Keshabpur is 200,229; among them male are 51.16% and female 48.84%; Total number of households is 40,000. Birth rate in Keshabpur is 1.48 %. Total number of farmers' family is 29,142 [7]. Mainly four unions in Keshabpur were selected for the study namely Trimohini, Sagardari, Bidyanandakathi and Sufolakathi. Waterlogged population in these four unions was 10100, 7100, 6060 and 4200 respectively [8]. Focus Group Discussion (FGD), Questionnaire Survey and Key Informants' Interview (KII) were some of the methods of the research.

CLIMATIC VULNERABILITY OF THE STUDY AREA

Bangladesh is generally considered to be one of the most vulnerable regions in the world to climate change induced sea level rise. South west coastal region is vulnerable to climate change induced sea level rise due to low elevation from sea level and a continuous process of land subsidence [9]. As the Jessore district is situated in the coastal zone, it would face increased water-logging due to increased flood volumes to drain and increased sea levels downstream.

In addition the increased transport of sediments might also lead to sedimentation of riverbeds in the mouth of the estuaries, further hampering the drainage of the upstream rivers and estuary branches. South-western embankments might face *occasional tidal overtopping*, leading to saline water-logging within embanked areas [10]. Under these circumstances, the study area is situated on a highly vulnerable position with the risk of increased future sedimentation and flooding.

IMPACT OF WATER LOGGING ON THE HABITANTS OF THE STUDY AREA

As consequence of climate change, many socio-economic impacts might be observed. A higher incidence of socio-economic disasters might be observed due to increased extreme weather events such as: severe and prolonged rainfall, flooding and water logging. These events will result in increases in: loss of lives and livelihoods and hardship for the poor, in particular women and children; devastation of human settlements and national infrastructure; and bottlenecks for national development due to frequent diversion of development budget to facilitate post-disaster rehabilitations. Higher risks for crop agriculture and the fisheries and livestock sector (due to floods, water logging and salinity intrusion) will pose risks to both livelihoods and national food security [11], [12]. Loss of livelihoods and productive activities in the rural areas might lead to out-migration from rural areas (climate change refugees) [13], [14].

Already the water logging in Kesahbpur Thana has severely affected the livelihoods of poor people. They have lost their land based productive system and also their dwellings. Also the water logging in Keshabpur has a detrimental effect upon different sectors like sanitation, health, drinking water, food security, education etc. This destroys the social fabric and human dignity of marooned people, and influence perpetuation of poverty, especially among those vulnerable groups who depend on small land holding for their sustenance [15]. Increased migration of the male member of the family was another finding of the study, which leave the women insecure in the water logging.

GENERAL COPING STRATEGIES OF THE WATERLOGGED PEOPLE IN KESHABPUR

Structural Modification

To cope with water logging people generally build houses with fences made of bamboo ('*muli*' bamboo) and wood. The foundation floors of the houses are raised so that water does not enter very easily, until it attains a certain level. In case of mud built houses, inhabitants raise the platform from 1.5 to 3 feet on an average [16]. Most of the houses use stairs to reach main dwelling. Vegetation upon the roof is very common in Keshabpur as productive land is limited. Roofs are also constructed of straw and brick cement (Tali).

In Keshabpur, houses inside the embankment has ceiling-like raised/ high platforms, locally termed as "*Darma*", which offer safe storage for all their valuables: ownership documents/ deeds of lands, other important papers/ documents, dry food e.g. fried swollen rice ('*Cheera*', '*Muri*' etc.), rice, and pulse, salt, sugar ('*gur*'), matches, candle, kerosene, quilt/'*kantha*', etc. [16].

In case of the extreme poor people, unfortunately the meaning of adaptation is actually nothing but shifting to the refugee shelter. Other than making any permanent arrangement of durability, very poor families generally find

no ways other than rebuilding their houses (with weak foundation) after coming back from refugee shelters.

Agricultural Coping

In the case of crop-agriculture, late varieties of 'Aman' rice viz. 'Kazal-shail', 'Raje-shail'(both black and golden), 'Chapraish', 'Kartik-shail', 'Dholamota', 'Leiccha', 'Nazir-shail' are sown with a view to coping with water-logging. During the water-logging period cattle are reared/ kept by raising the floor. Seed-beds are also prepared by raising the piece of land with soil/ mud. In some places crop-land is raised to some extent for cultivating winter crops ('*rabi*' crops). In many areas as a precautionary and safety measure, the levees (sides) of the fishing ponds are raised up to a certain level so that fish cannot leave the ponds [16].

From FGD it is found that when the area is extremely waterlogged, people generally get involved in the 100 days work program of government and get daily basis salary such as 100 tk per day. They become engaged as day laborer for road construction, canal digging etc. Ring gardening, floating vegetation etc. are some new technologies which are recently being practiced by the local farmers.

Livelihood Coping

Households adopt a wide range of strategies to cope with crisis. Immediate after/ during the crisis people use to take credits from relatives/ neighbours, often they take loans from local "*Mahajans*" (i.e., rich persons) with high interest (usually 100 tk. interest per month for 1000/tk. of loan) to face the emergency needs. Especially when diarrhea and other diseases breaks out, they go for informal loans. During such crisis situation, they sell their homestead trees, lands, jewelries. Of course selling lands are the last resort for them.

Most of the participants presented in the FGD were landless and marginal. Day laborer's daily income was not more than 30 tk. They cope by changing their occupation in waterlogged period such as farming to van pulling. Sometimes van pullers also do not find ways to drive as major roads becomes inundated. In such situation people migrate to other area for earning livelihoods. Migration is a new technique of survival in Keshabpur as land based production system is almost destroyed. The target groups in the research are now more interested to switch job or migrate elsewhere in search of job. But in most of the cases, extreme poor do not even have that much money which is needed to start a new business or migrate.

Almost 17% of the respondents said that their male counter part had gone to Jessore town and Dhaka City in search of work as they lost their current livelihood in Keshabpur [16]. Migration started only few years ago, according to the respondents. Most of the respondents think that the siltation of Kabodak River in 2000 is responsible for the rural livelihood loss and only for this people are leaving the area.

Sanitation Coping

Sanitation coping is a big issue, especially for women. During water logging, most of the latrines become inoperable. Then people generally have to go to nearby field or jungle for defecation purpose. Unfortunately, the most common practice, in extreme waterlogged condition, is to defecate directly into the courtyard's water [16]. One of the common coping practices is to increase the ground level of latrine with muds or woods. Due to social reason, most of the waterlogged women defecate right inside the home on a piece of paper and afterwards throw it into the water. Therefore, their health is more vulnerable than others.

Coping with Drinking Water

Among 18730 tube wells in Keshabpur thana, 800 tube wells were completely inundated during the 2006 water logging. Rainwater is now harvested in some areas of the Keshabpur with a view to using as drinking water. Besides this, branches of trees are stored on "Darma" to be used as firewood for boiling pond-water.

Water purification system is very much poor in the area. Most of the people drink water directly from pond or river etc. (68%), 7% boil, only 1% filter and 20% use water purification tablet (Fig. 1). Water purification tablet has been distributed by IDO and Muslim Aid in Trimohini Union.

RECENT INSTITUTIONAL INITIATIVE OF COPING

From Focus Group Discussion it was evident that most of the people in Keshabpur thana does not get any institutional help in adopting coping in water logging. Most of them use local technologies without any training from GOs or NGOs. Only 21% of the participants said that they had got training or institutional help in adopting coping strategies.

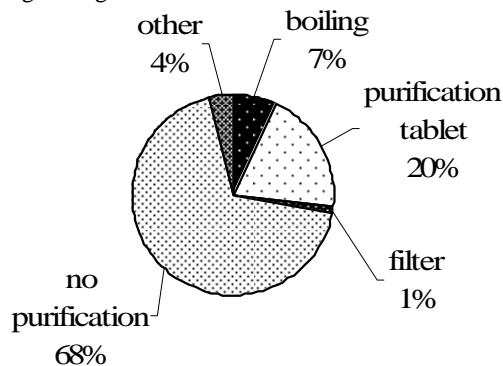


Fig. 1: Types of Water Purification in the Study Area (Questionnaire Survey, 2008)

NGO Programs

During FGDs and household survey, people mentioned about few GOs and NGOs who taught them effective coping strategies. Key Informants' Interviews (KII) in different organizations revealed that NGOs such as IDO, Uloshi Srijony Shongho, People's Forum on Water logging, Muslim Aid and Shamadhan are involved in disseminating coping techniques among local people. Mainly these NGOs

are actively involved in popularizing coping activities in the area.

Housing and Livelihood: Samadhan trained people in all the four Unions on how to increase the height of house and how to build durable houses. They also taught people how to overcome livelihood difficulties during extreme water logging through establishment of floating gardening, ring gardening etc. Both the ring and floating gardening are types of coping in waterlogged area invented by local NGOs and these technologies have been proved very effective. Local people found ring gardening very useful in places where lands are mostly waterlogged and is not suitable for ground vegetation.

Ring based vegetable gardening is a popular way of coping. Women informed that they are getting excellent benefit from these two technologies as it does not require exposure of land. This is an innovative technologies invented by local people and NGOs. In this process, big cement rings are filled up with sufficient amount of suitable soils. These rings with soils are then used to plant trees and vegetables. This particular technology reduces the risk of water logging as vegetation is accepted to grow at a higher level than the ground. This technology is demonstrated by different NGOs among the villagers such as Uloshi Srijony Shongho, People's Forum on Waterlogging and Samadhan.

GO Programs

Housing and Livelihood: 'Reducing Livelihood Risk Project' is a big budget project locally operated by Samadhan NGO funded by CDMP, EC, DFID, GoB, UNDP etc. The activities of this program are limited to Trimohini, Bidyanandakathi, Sagardari, Pajia and Sufolakathi union. This program includes increasing the ground level of homestead (so that water cannot enter into house), tree plantation, increasing the level of pond bank, fish cultivation, vegetable gardening, constructing *Macha*, Duck rearing etc.

This program aims at developing a comprehensive lifestyle by increasing the ground level of homestead and thereby increasing the social security. The soil used for increasing the homestead height is taken from a nearby place where small pond is created automatically. Upon that pond people are practicing floating gardening and the pond is being used for fish cultivation as well. In this way, this project teaches how to utilize a small space to its fullest. This is a very good example of increasing people's capacity towards better coping condition in waterlogged condition.

Management of Refugee Camps: Government establishes refugee camps along the side of the main roads or embankments during extreme waterlogged condition. Government also construct temporary tube well and latrines for refugee families. Taking shelter to refugee camps are the techniques of coping during severe water logging. People find no ways other than leaving their ancestral home in waterlogged condition. Hence, struggling for survival is the other name of coping for people in Keshabpur [16].

Community Based Adaptation Effort

People in Keshabpur have developed their own coping mechanism through the years. They understand that community level efforts should be much effective than household level coping efforts. From this idea, inhabitants of Trimihini and Sagardari established an example of community based coping effort which saved life of many people from water logging and ensured agricultural production. In this effort, people constructed an embankment with polythene, plastic and bamboo and restricted water from overflowing the crop field. It protected bighas of land from the detrimental effect of water logging.

This is a very good example of how local people can participate in the development process with their limited resources. In this case, people contributed money for buying polythene, bamboos etc. and those, who couldn't, just became involved in the physical labor. That is how this effort became successful and now thousands of people in Trimohini and Sagardari are getting the benefit. They are getting crops after a long period in their locality [16].

SUMMARY OF FINDINGS AND CONCLUSION

Major findings revealed the constraints towards reducing people's vulnerability in the study area such as climate change, poor coordination among stakeholders, limited institutional initiative of coping etc. Coping is the other meaning of survival for the Keshabpur dwellers. They are willing to learn about new coping technologies but there are few institutional initiatives. Improving institutional coping efforts is one of the most necessary acts that are needed to be implemented soon. Under this approach, Government and other institutions should come up with necessary training and skill development program for promoting better coping strategies in the affected areas. Agricultural Extension Office should also come up with training and workshops for poor farmers in order to introduce them with water logging adaptive technology. Also LGED should construct durable school buildings in highlands so that children can have the chance of getting education all the year round. However, facilitating drainage of water is the greatest perceivable adaptation, which is far beyond the capacity of a small water logged community. Therefore, authority should plan and execute an emergency water removal/drainage programme in the study area.

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