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The Best Practices of Coping Strategies during Hazards: A Lesson from Local *Charland* Women

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Abstract: Women and children are 14 times more likely to die than men during a disaster. In the 1991 cyclone disaster which killed 140,000 people in Bangladesh, for example, 90 percent victims were women. Although women are disproportionately impacted by disaster and swift environmental changes, women have contributed to curbing the impacts of climate change. Women's knowledge and responsibilities related to natural resources management have proven to be critical to community survival. This paper would be useful to find out the problems and challenges of the *char land* women and to explore the best practices of survival strategies with involvement of local knowledge for the *charland* women during hazards. The findings of this paper will be helpful for thinking forward on Survival Strategies of the *charland* women from change hazard in Bangladesh.

Introduction

Bangladesh has to face devastating flood and river bank erosion hazards every year Due to flat topography. Of the total land area of the country, 5% is *Char*, which consists of approximately 7,200 square kilometers. The riverine and coastal areas of Bangladesh, known as '*Char*', are home to the poorest and most vulnerable communities in the country, over 80% are in extreme poverty. Gradually the population of *char* is increasing. About 20 lac people live in the *Char*s. These *charland* dwellers are the poorest and most vulnerable people in Bangladesh (EGIS 2000).

Flood occurs almost every year in Bangladesh as a part of natural phenomenon, although the intensity and extent of flood may vary from year to year. During floods, a large percentage of *charland* people especially women and children become very vulnerable. They have only the polluted water of the inundated areas to drink since most of the hand tube wells get submerged. Fuel is in short supply during flood; the option of boiling the water prior to drinking is not so practical. Thus, shortage of pure drinking water is a problem in *Charland*s during flood. Problems of storing and cooking food and of drinking water lead to malnutrition and diarrhoea to most of the *charland* dwellers. Other diseases such as dysentery, pneumonia and scabies are very common as an after effect of flood the water borne diseases are increasing.

The participation and support of rural women in their livelihood is very high. The *Charland* women are taking care of the whole of the household chores, childcare and rearing livestock. But in disaster, these *charland* women are the main sufferers to face various types of problems, difficulties and challenges. The *charland* women suffer from both sides, first as they have to work hard to save from the floods and afterwards, when men leave for the cities in search of job and the women are left fending for the families alone.

So, considering all of these, it was felt that a study in this regard would be useful to find out the problems and challenges of the *charland* women and to explore the best practices of survival strategies with involvement of local knowledge for the *charland* women during hazards. The findings of this paper will be helpful for thinking forward on coping strategies of the *Charland* Women from climate change hazards in Bangladesh.

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Objectives and Methodology of the Study

The broad aim of this study is to identify the present climatic situation of the chars land areas in Bangladesh. The other objective is to identify the barriers and challenges of the *Char* land women livelihoods in disaster. And finally to explore the survival strategies with involvement of local knowledge for the *Charland* women during hazards.

This research is based on both the secondary and primary data collection through the questionnaire survey from two *Charland* named as Kunderchar of Shariyatpur district and Charwadel of Patuakhali district. Then there were some analysis and synthesis of the information and data to find an apparent depiction of the challenges of the *Charland* women livelihoods in disaster and some strategies with involvement of local knowledge for the *Char* land women during hazards.

Indigenous Knowledge and Coping Response

The indigenous knowledge of people represents experience gained over thousands of years of direct human contact with the encompassing environment. The local people have gradually developed enormous volumes of knowledge about their local environments over the centuries by directly interacting and experiencing with the environment, for instance, knowledge about the soil, climate, water, forest, wildlife, minerals etc. in the locality. This is the endowed wisdom of people which implies a refined ecological awareness of the nonlinear nature of our environment shaping and organizing the livelihood strategies of people (Figure 1).

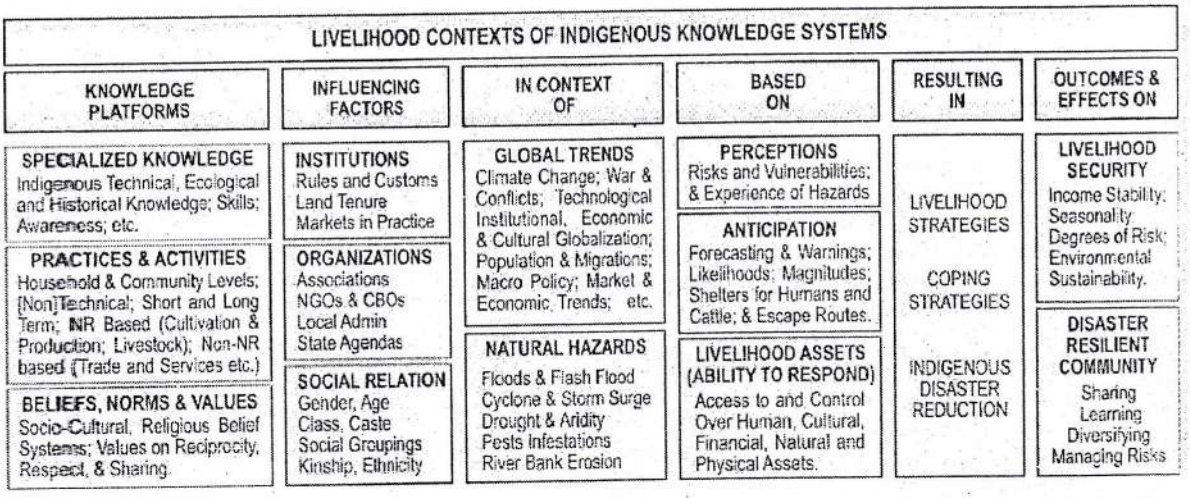


Fig.1: A Framework of Indigenous Knowledge and Coping Strategies for Disaster Reduction

Knowledge of how vulnerable people respond to a threat is essential. Outside interventions can then be built on these strategies. Natural hazards are not new and people have been living in hazard-prone areas for centuries – in some cases for thousands of years. They have, inevitably, devised their own methods for protecting themselves and their livelihoods. These methods are based on their own skills and resources, as well as their experiences. Their knowledge systems, skills and technologies are usually referred to under the heading of 'indigenous knowledge'.

The application of indigenous knowledge in the face of hazards and other threats is referred to as a 'coping strategy' (also sometimes known as an 'adjustment' mechanism or strategy, and in some circumstances as a 'survival' strategy). The choice of skills and resources to be applied varies according to the nature of the hazard threat, the capacities available to deal with it, and to a variety of community and individual priorities that can change during the course of a disaster.

The present study would provide policy makers with indigenous knowledge related to coping strategies and its variance by hazard types and socioeconomic group, the occurrence of diverged strategies in different ecological settings, the impediments of using existing facilities (such as costs, distance, staffing, education, hazard causation beliefs, local power and etc.), perceived quality and appropriateness of services rendered and the impact of public policy actions.

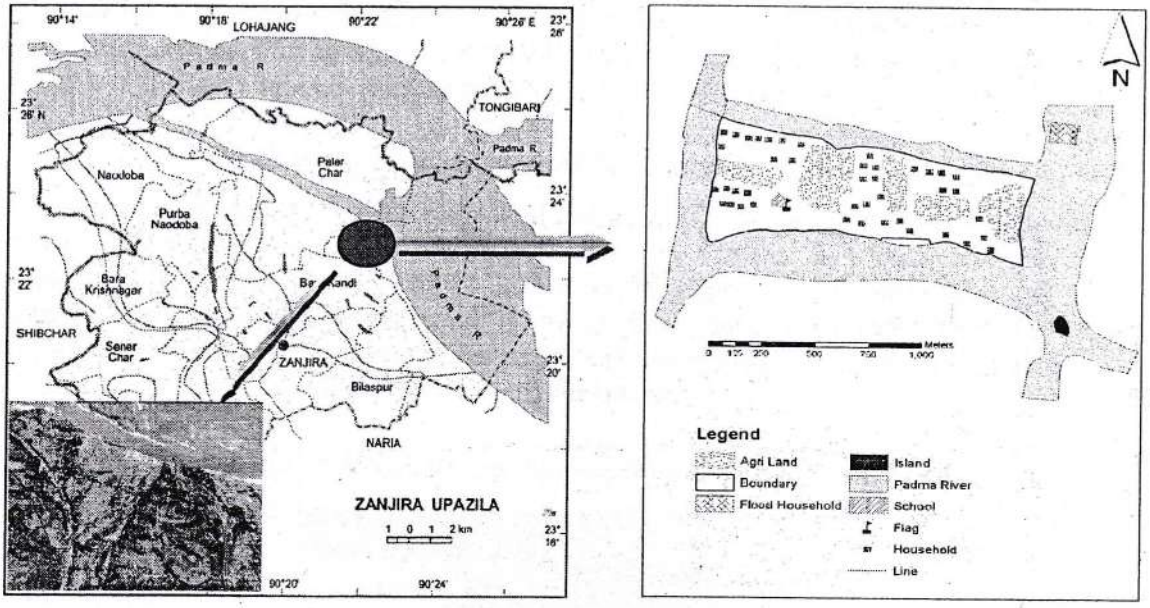
The Study Area Background

Kunderchar

Location of the Study Area: Kunderchar is situated by the river Padma at Naria *Union* of Zanjira *Upazila* of Shariyatpur District (Figure 2). The entire area has been emerged from the river about 25-30 years ago. People have been living here for more than 20 years (Field Survey, 2010). The settlers predominant the area is from Old Kunderchar. After the erosion of previous char they placed themselves to newly available land that is Kunderchar. Because of its eroding nature the char is rarely has big deep rooted tree.

Area and Geographical Feature: The soil of this char is sandy and fertile. Soil texture is eroding. The entire area can be divided into three phases:

- The central portion of char is the highest elevated land. It is the oldest part of char.
- The next highest elevated land is the next to central part partially elevated mostly having sloped.
- The third part is the newly formed land that is nearest to the river. It is mostly in same elevation to the river. The soil texture is not consistent and it faces continuous erosion especially in the monsoon.

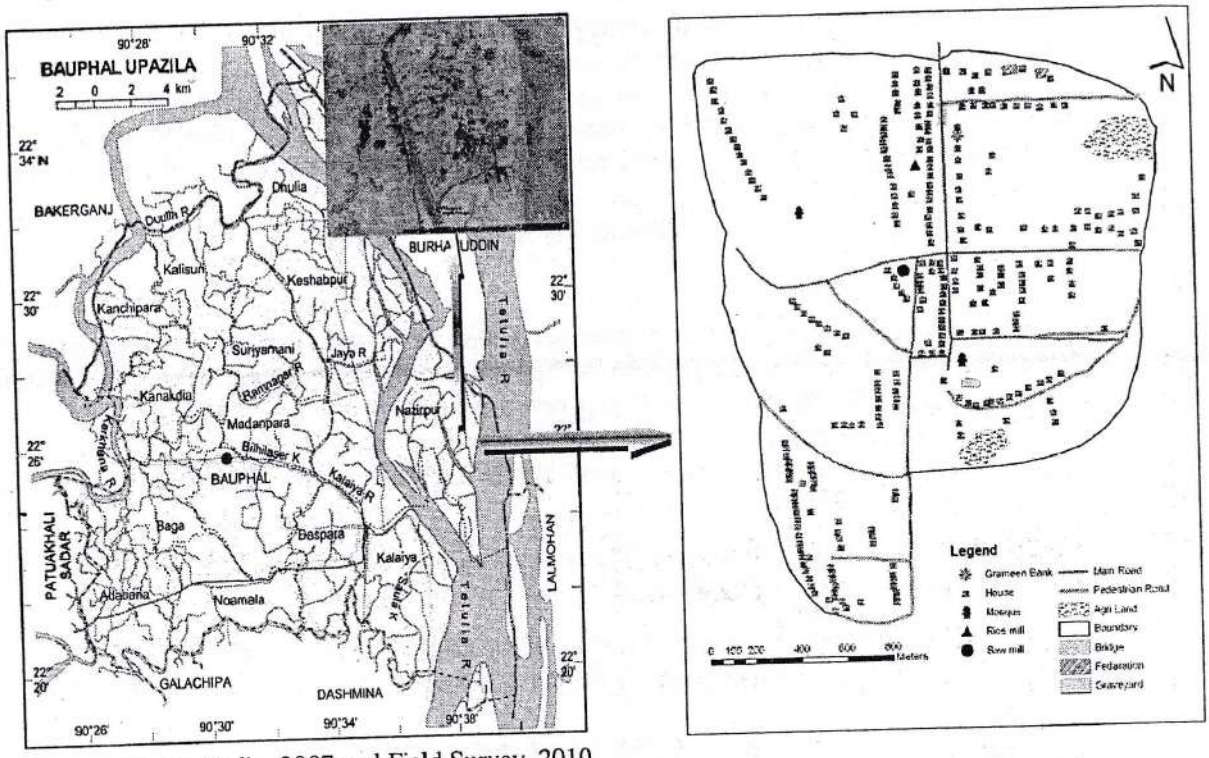


Source: Bangla Pedia, 2007 and Field Survey, 2010

Fig.2: Map of Study Area-Kunderchar

Charwadel

Location of the Study Area: Charwadel stands by the river Tetulia, a tidal river close to the coastal area. This char is a part of Baufal *Upazila* of Patuakhali District (Figure 3). Char land came over water 60 years ago. This char is larger than common *Union*.



Source: Bangla Pedia, 2007 and Field Survey, 2010

Fig.3: Map of Study Area- Charwadel

Area and Geographic Information: The soil of this char is mixed with sand and alluvial silt deposit during flood. Entire area of this char is low lying area submerged under water during high tide. During Cyclone Sidr this char was drowned with 10 feet high tide.

Scenario of Seasonal Disaster of the *Charland*

According to the people of Kunderchar, this area is prone to flood and riverbank erosion besides this nor'westers also appears here often. The people of this area uses Bengali calendar to mark the seasonality, degree and length of the hazard. The area begins to receive flood water during the month of Ashar and Shrabon well known for the rainy season in Bangladesh. Flood reaches to its danger level and extremely submerges the area during the month of Bhadro and Ashwin. After that the flood water runs away during the month of Kartik (Figure 4).

Disa ster	Baishakh	Jyistha	Ashar	Shrabon	Bhadro	Ashwin	Kartik	Agrahayon	Poush	Magh	Falgun	Chaitra
Flood												
River Bank Erosion												
Nor'westers												

Source: Field Survey, 2010

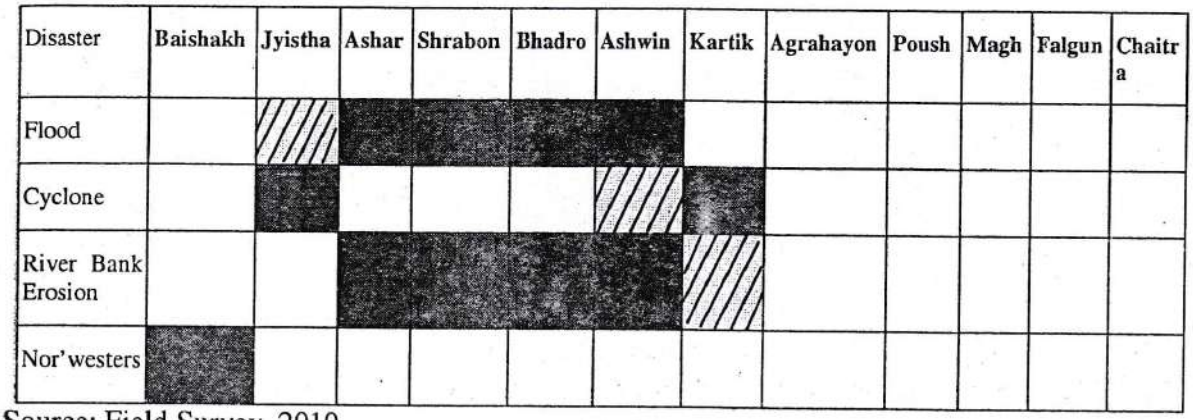
High	Medium	Low

Fig. 4: Seasonal Disaster Calendar of Kunderchar

River bank erosion occurs more frequently than other disasters here. It occurs more or less all the year round but its most dangerous period is from the month of Jyistha to Ashwin. River becomes

more ferocious during the month of Ashar, Shrabon and Bhadro. River bank erosion begins to lose its speed during the month of Ashwin.

Flood, cyclone, riverbank erosion are common disaster in Charwadel suffered by the *Charland* people. Flood water submerges the area in the month of Jyistha and continues to stay in this area till the month of Ashwin (Figure-5). The intensity of flood rises during the month of Ashar with the beginning of rainy season. This is the most cyclone affected area of Bangladesh. Cyclone is created mainly two times in a year-at beginning of the hot summer month of Jyistha and at the end of summer during the month of Kartik which causes numerous death of both human and animal. River bank erosion severely occurs during the month from Ashar to Ashwin. Nor'wester commonly known as *Kalbaishakhi* occurs in the month of Baishakh each year.

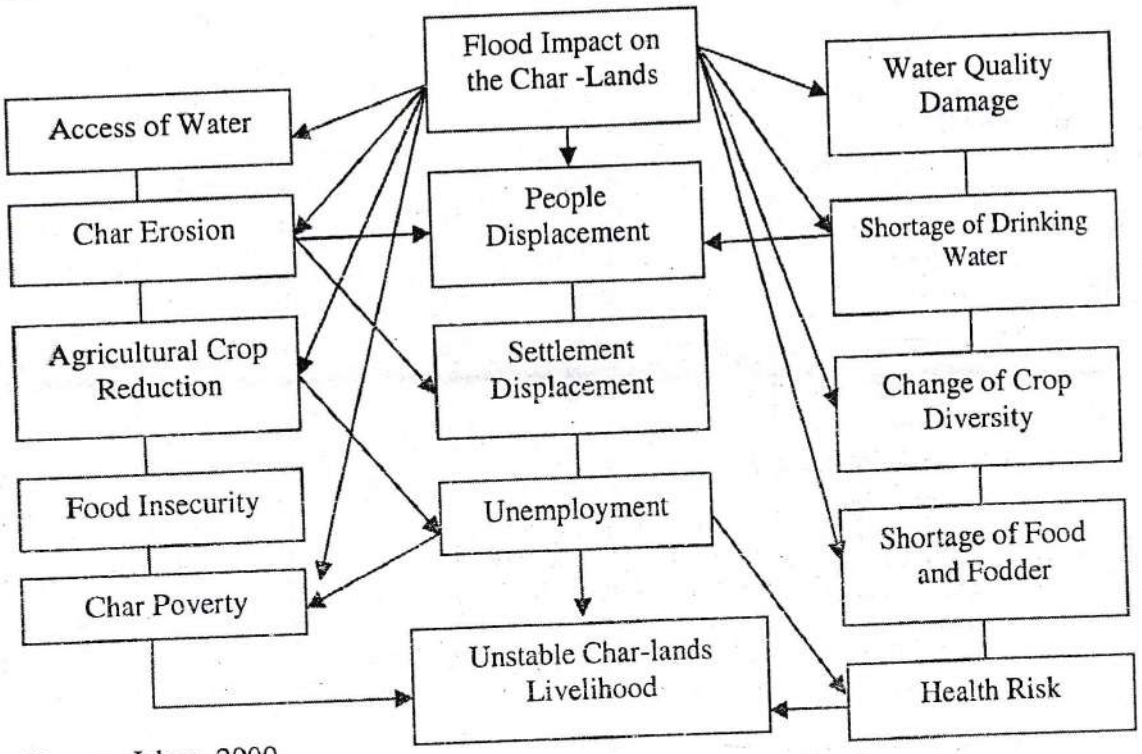


Source: Field Survey, 2010

Fig. 5: Seasonal Disaster Calendar of Charwadel

Flood –Erosion Impacts on *Charlands* and Settlement Displacement

The settlement relocation in the char-land in Bangladesh is a common feature to the people of Bangladesh (Alam, 2000) and they have learnt how to survive with massive floods in the char-lands. The impacts of massive floods in char-lands are tragic and vulnerable which has been demonstrated in figure 6. The river bank erosion and char land slide makes the Char-Wadel more vulnerable. The settlements, livelihood and the cropping systems are also unstable. Figure 6 shows the impacts of floods and erosion on charlands. In figure 6 there are 13 important issues these are severely affected by floods and erosion and as a whole it is the treats for stable char-lands and livelihoods (Islam, 2000).



Source: Islam, 2000

Fig 6: Flood impacts on Char-Wadel

In order to determined the spatial distribution of the *char* people, population density per km² and average yearly affected inhabitants under both scenarios portion of Char Wadel mouza falling the bellow equation developed by Carlos (1994). The population of the *char* erosion affected area is given by the following relationship:

(Average population density of Char Wadel Mouza × (Affected area of Char Wadel Mouza)

= Affected population of Char Wadel Mouza

= 406.46 /km² × 4.61 km²

= 1883

Therefore 1883 persons were affected by yearly floods and *char-land* erosion in this Char Wadel mouza. The population density of this Char Wadel mouza was calculated through this equation which is 406.46 people/km². The equation also estimated that approximately 1883 inhabitants of Char Wadel mouza were affected annually and they had to relocate to different places and come back to the same char when the new char-land emerges. Among the affected Population approximately 880 are female (46.73%). Now the total population of the Char Wadel is 2093 and the Female populations are 992 (BBS, 2011).

Among these female people the age groups are as follows according to the BBS 2001.

Locality Name	Total Female	0-4 Years	5-9 Years	10-14 Years	15-17 Years	18-34 Years	35-59 Years	60+ Years
Char Wadel	880 (100%)	179 (20.34%)	171 (19.43%)	87 (9.88%)	17 (1.93%)	245 (27.84%)	147 (16.70%)	34 (3.86%)

Source: BBS, 2001.

Women and Natural Disasters

Disasters can devastate the environment, but the women have to still perform their regular duties like preparation of food, collection of water and fuel, often under impossible circumstances. The physical burden of coping falls heavily on women. They have to survive by adopting strategies to cope up with all odds of nature and the society (Ahmed, 1995).

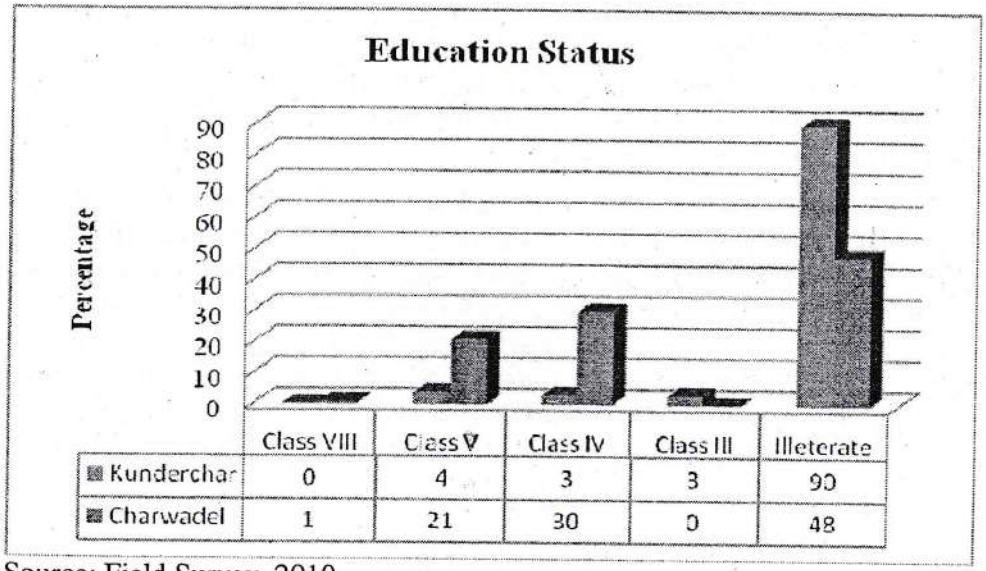
Riverbank erosion uproot people from their settlements, cause unemployment and marginalize people with little resources (shamim, 1995). Women's gender assigned tasks become much more difficult to perform under displaced situation. As a consequence, displaced women work for greater number of hours (Shamim,1995).

Cyclones occurred in 1970, 1988, 1991 and 1998 causing loss of millions of human lives, livestocks and damage to infra structure (Jahan, 2008). In a study of cyclone of 1991 it was revealed that, women being malnourished, weak and vulnerable, failed to protect themselves. In 1999 Cyclone 65 percent of dead people were women and children (Jahan, 2008).

Form the above discussion it can be said that, women are the most vulnerable group in society and suffer the most from any degradation of the environment.

Barriers Faced by the Women in Charland for Disaster and Other Issues

Knowledge: About 90 percent of the women found illiterate at Kunderchar (Figure 7). Lack of knowledge is the main problem for the women to take the appropriate decision during disaster. They do not know how to reach to a safer place. They cannot avoid their ignorance during disaster. This brought them to a more complex situation.



Source: Field Survey, 2010

Fig. 7: Educational Status of Women at Kunderchar and Charwadel

Connection: Women of the *Charland* have very little knowledge about the outside of their house. They do not know where to go during disaster. They also deprived of relief materials.

Social Norms: Women have to abide by the norms and customs of the society. This is very much dominating in the rural society.

Lack of Cash Money: Usually women do not have enough money in their hand that they can expense during disaster. Waves battered the foundation of their homesteads and they lived in constant fear of their homestead being washed away. Fear was a constant companion of those living on the retired embankments, as the embankment itself could at any moment is washed away by pounding waves. Women complained that their dwelling units provided inadequate shelter. As they were poor, their dwellings were not strongly built. These were in constant need to repair but they could not afford it. Neither did they have the manpower, nor the money to do so during heavy rain and storms.

Disease and Sickness: These households were especially vulnerable to disease and sickness. Inadequate income meant their families were malnourished. Low quality living environment and poor housing condition meant they were more exposed to the elements of nature. This was why illness and inadequate access to medical care ranked as the third most important problem cited by them.

Insecurity of Property: The respondents observed that they suffered from insecurity of life and property. Although the embankments were built on land acquired by the government, previous owners of those plots threatened them with forced eviction if they did not pay them rent. There was social conflict between the embankment dwellers and the villagers who had previously owned the land. Petty theft was common in the area and drug addiction and criminal activities were also cited as reason for insecurity. They were also under constant threat of eviction from the BWDB authorities.

Lack of Privacy: Amongst other problems cited, lack of privacy and difficulty in obtaining potable water were very important. As these households were poor, they could not afford to build proper latrines. As such, most of them had to go to the fields or *chars* to relieve themselves in the early hours of the morning or during the night.

Majority of the households had to take loans in cash or kinds to tide them over financial crisis. The main source of loan was non institutional. Neighbours provided loan in most of the cases. Some took loans from relatives. Some others took loan from *mahajans* (money lenders) or bought goods from store keeper son credit.

Difficulty in obtaining Fuel: Households faced difficulty in obtaining fuel for cooking. Previously they had their own source or they could collect dung or sticks free of cost from the fields surrounding their homes in their villages. Now they had to buy fuel, which meant a dent in their small budget. A small basket of cow dung cakes - the whole of which was used for cooking a day's meal -cost about five taka. Only 7 households reported to have taken loan from NGOs. It is obvious that institutional credit is definitely hard to obtain. A few households reported that they had to depend on the income of their sons during the period they could not find any work. Two households reported selling homestead products to meet their daily needs and two others said they used up their savings.

Access to Institutional Credit: As their income was inadequate; most of the households had to incur debt. But access to institutional credit was difficult. The only institutional source was the NGOs. Only a few had access to these. None had access to banks.

Problems Faced in Buying or Selling Products: Some of the households sold products such as eggs, milk, fruits and vegetables. But they had difficulty in carrying these to the market. Whether it was for buying or selling, going to the market itself was a problem for them. This was because the market was far and transport was not readily available in all of these places. As prices of goods soared, they had to buy things on credit and tried to cut down on their food intake. They waited for

government relief to arrive. There was scarcity of fuel and medicine and potable water. Food, portable water and shelter were the immediate needs of these people during the floods.

Preparedness Activities Performed by Women before Disaster

Pre-disaster activities of the Charland women include the following:

- Collect and store dry foods
- Collect and save money
- Repair and fasten house Roofs
- Raise the plinth of house and homestead upto flood level
- Preserve fuel and cooking *chula*
- Establish tube-well, latrine on a high land
- Plant bamboo, papaya, and banana on a high land
- Prepare *macha* for vegetables
- Raise the place of livestock to save from flood water

Responsibilities Taken by Women during Disaster

In flood time the women take children and elderly person to *macha*. During cyclone they help the family to reach cyclone shelter. Prepare boat if they get the message of early warning about cyclone or flood. Collect fresh water for the crisis period. Produce daily meal for the family members and maintain the nutrition level. They also take care of domestic animals; be aware of harmful snakes. They take the necessary health care of family member.

To survive from devastating hazard most effective steps Taken by *Charland* women are:

Financial coping: As the female heads did not have a regular source of income, their income was inadequate to meet their daily needs of life. About 93 percent of the respondents said their income was not sufficient. When asked how they managed their household expenses when they did not have any job, various answers were received.

Coping with natural disaster: Flood and river bank erosion were recurrent events in the lives of these embankment dwellers. The level of floodwater determined what strategy the head of the household should follow to cope with the crisis. When water entered the hut and was upto a foot deep, the family usually built a bamboo platform *(mancha)* on which they cooked, ate and slept. If the floodwater rose any further, they had to abandon their homes and took shelter on higher grounds of the embankment.

Coping with illness: In the event of illness, the households did not approach anybody for help. Some, however, tried to obtain help from neighbours. Only a few, about 6 percent sought help from self-physicians when they fell ill.

Coping with insecurity: In the case of any type of events giving rise to insecurity of life and property, majority of the households (58 percent) tried to cope with the situation themselves. In case they needed help, about 24 percent said they approached neighbours and another 13 percent asked help from relatives. The union council chairman or the police were hardly ever approached.

Recommendations

Policy makers from all sectors urgently need to focus attention on the implications of climate change. Support for adaptation to the impacts must start now. Many aspects of climate change and

variability are already having a profound effect on the livelihoods of poor rural communities and enough is known about the future impacts of climate change for action to be taken now. The vulnerability of the poorest to climate change is a central challenge. 'No regrets' adaptation options, which focus on poverty relief through diversifying livelihoods and extension support for sustainable agricultural systems, must be a priority.

According to the participatory discourse, taking local knowledge into consideration in terms of practices and contexts can help implementing organizations improve their planning for and implementation of disaster preparedness activities; and it can help improve project performance and project acceptance, ownership, and sustainability specifically. This means that understanding, accounting for, and respecting local knowledge contribute to cost-effectiveness in the long-term, from both a financial and a social point of view– especially in the context of complex, changing, and growing hazards.

Firstly, from a financial point of view, economies of scale are based on the assumption that people perform better on some scales than on others and that different resources are found on different scales. Solutions in resource management, development, and disaster management need to go beyond the dichotomy between local versus national management levels and integrate cross-scale institutional linkages.

Understanding local knowledge and practices can help identify what is needed and acceptable locally and how people's participation can be solicited to ensure their support for external action. Building on local knowledge and practices (i.e., capitalizing on local strengths), when it is relevant to do so, can decrease dependency on external aid. Local people provide continuity and can monitor the actions taken.

Secondly, from a social point of view, taking local knowledge and practices into account promotes mutual trust, acceptability, common understanding, and the community's sense of ownership and self-confidence. Understanding local knowledge, practices, and contexts helps development and research organizations to tailor their project activities and communication strategies to local partners' needs. It also enables development research organizations to act as intermediaries in translating messages from government level to communities in a way that is understandable and credible.

For example, a meteorological agency might release the following message to communities: "The river is going to rise by one to two metres in the next 24 hours." But is it enough? What does it mean to the locals? Government agencies often release information that is not understood at local level, because the community had a different perception of the landscape from that of the mapmakers. Hence, communication tools for disaster preparedness, such as official warning messages or hazard maps, need to incorporate local references.

Conclusion

Climate change will affect all areas of development work; mitigation and adaptation policies therefore need to be integrated into all existing projects and programmes. Climate change puts populations, particularly in low-lying poor countries like Bangladesh, at huge risk of becoming displaced.

As the years pass, the economic condition of the *char* people deteriorates and the number of the landless grows. Resources unevenly distributed as they are, decline and grow thinner and the traditional practices of adjusting to the floods and erosion become increasingly difficult. The scenario of the riverine areas is a grim one, where impoverished people, living in this fragile environment, are increasingly becoming less capable of coping with floods. Each flood combined

with erosion cause not only physical hardship but also irreparable loss in economic terms. The *char* dwellers in desperation wait for the government and other aid agencies to come forward and help them recover the losses caused by the floods. In fact, they reach a point when they can no longer help themselves. The *char* people live with dreams and hope that a day will come when the government will come forward and their dreams for a better life would be fulfilled. But so far, everything turns to be pious wishes. So all the Char peoples try to mitigate the disaster with their local knowledge and resources.

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