



Vulnerability of Char Dwellers to Flood Hazards – A Case Study in Two Chars in Murshidabad District, West Bengal

KEYWORDS

Flood Vulnerability, Chars of Murshidabad, River Erosion, Social Vulnerability

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ABSTRACT Poverty and vulnerability to environmental hazards go hand in hand. The poor are forced to shift to the more flood-prone environments due to least monetary cost of settlement. If poverty itself is one of most factors causing vulnerability, then vulnerability to flood hazard is now considered not only as a product of physical location but as a product of social condition also. The most vulnerable are low-income people, migrants, those living in fragile houses, those living without insurance or financial reserves, elderly people and infirm people. The chars are extremely vulnerable to both erosion and flood hazards due to their proximity to river. The effects of riverbank erosion and widening of the river channel on the people living in chars have remained significant. This paper aims to analyze the flood-hazard-vulnerability of the inhabitants of two chars in Murshidabad district of West Bengal. The study is primarily based on field survey data. This study will help detail analysis of the flood problem in the char areas and demand the attention of the administration regarding the rehabilitation.

INTRODUCTION

The year 2001 saw the publication of a series of major reports of the IPCC. The report by Working Group II examines the potential impacts of climate change and the vulnerability of natural and human systems to these impacts. One of the key adverse effects of predicted changes is a 'widespread increase in the risk of flooding for many human settlements' and the 'impacts of future changes in climate extremes are expected to fall disproportionately on the poor'. As Cutter (1996) notes, vulnerability to environmental hazards can be analysed at different scales, from the personal level (through loss of livelihood etc.) to the societal level (through damage to infrastructure systems and regional economies).

In one recent paper Adger (1999) defines vulnerability as 'the exposure of groups or individuals to stress as a result of social and environmental change, where stress refers to unexpected changes and disruption to livelihoods'. There are the differences among approaches between those that see vulnerability in terms of variations in exposure to hazards and those that concentrate on variation in people's capacity to cope with hazards.

The most vulnerable are low-income people, migrants, those living in fragile houses, those living without insurance or financial reserves, elderly people and infirm people. They may be the slum residents living in or near drainage channels, or the char people (Parker, 1999). Poverty and vulnerability to environmental hazards go hand in hand. The poor are forced to shift to the more flood-prone environments due to least monetary cost of settlement. If poverty itself is one of most factors causing vulnerability, then vulnerability to flood hazard is now considered not only as a product of physical location but as a product of social condition also. Cannon (2000) makes the point strongly.

It is vital to recognize that vulnerability should be treated as a condition of people that derives from their socio-economic position. It is, therefore, not proper to use it loosely or as a characteristic of exposure to hazards alone, since that would underestimate the key components of ability of coping with hazard – giving prominence to technical fixes.

Maskrey (1999:85) identifies the causes of the vulnerability of a community as multi-dimensional and observes that:

"A community's capacity to absorb the impact of a hazard event and recover from it is determined by its geographical location, the resistance of its physical structures and infrastructures, its economic capacity expressed in terms of asset

levels, reserves and access to loans, its levels of social cohesion and organization, its cultural vision of disasters and many other factors."



Figure 1: Location of Study Area (Adopted from Google Earth)

STUDY AREA

The river islands or the chars, as they are called by local people, are the sand and mud banks formed by the meandering river, now split between India and Bangladesh. The largest among them is Nirmal char (24 19 - 24 21 N and 88 22 - 88 31 E) in Bhagwangola II block, which is within the territory of India. It is like scores of other such sand and mud banks, the development of which is ignored by the concerned administration. It is spread across 50 sq. km and has a population of 20,000. Another 8 km wide char known as Udaynagar Colony Char (24 06 -24 11 N and 88 42 - 88 48 E) was emerged on the east bank due to shifting of river Padma in Jalangi block of Murshidabad district.

PROBLEM OF THE STUDY AREAS

In 1948, a commission decided that even if the river changed its course, the international boundary between India and Bangladesh would remain the same. Thus the boundary now runs through many of the shared chars. And from here emerges the constant battle for survival for the thousands of people who inhabit the chars in the Murshidabad district. Inhabitants, mostly hapless poor farmers, who have lost their land on the mainland due to river erosion, are forever on the lookout for new stretches of land to restart their lives on.

Very close proximity to Bangladesh border comes with its own set of problems. Criminals from Bangladesh often raid the chars and take away harvested crops and cattle. There are also clashes among the settlers for cornering the maximum amount of land as the land is a free-for-all. The

chars are convenient bases for smugglers and traffickers. While cattle are the most common item smuggled out of India through these chars, electronic goods and synthetic textiles often come into India. Thus virtual absence of law and order deprives the inhabitants of the minimum health in their social life.

None of the chars has electricity or metal roads. Educational and medical facilities are practically non-existent. The chars only have primary health centre and elementary school, which are used as flood shelters also, - but even these primary health centres and elementary schools do not function properly for the lack of adequate attention of the administration, poor communication facilities, adversities of nature and lack of awareness among the inhabitants about their utilities. The act of crossing the river is very often risky and the atmosphere on the chars is generally one of insecurity. The newly emerged land becomes vested in the hands of the state government.

Since the construction of the Farakka Barrage between these two districts 700,000 to 1 million of people have been out of their original habitat and nobody even counts the islanders' loss. Most of the families have shifted their houses up to a maximum of 17 times as their settlements become flooded due to change of course of river and have re-established their villages with the original names. These people include even persons who once owned about 300 acres of cultivation land mango orchards have lost everything and they are now desperately looking for a small piece of land for shelter. This long-lasting recurring disaster has now become beyond the coping mechanism known to the suffering communities. For desperation to survive, some of the relatively able-bodied men migrate to Mumbai, Surat, Ahmedabad, Kolkata and other large cities in India and in the Middle-East and since they do not possess any domicile identity, such as, land holding records, ration, voters' ID cards etc. they become the victims of repeated police harassment.

OBJECTIVES

This study has two main objectives-

- To analyze the flood-hazard-vulnerability of the inhabitants of these two chars in Murshidabad district of West Bengal.
- To portray the wretched living condition of these inhabitants struggling with hostile environment.
- To assess their perception regarding their distress.

METHODOLOGY

Socio-economic dimensions of household vulnerability to flood hazard are examined in this paper on the basis of quantitative household data collected from survey and qualitative data regarding their perceptions from the interviews. The survey was administered to a total of 119 households, 54 from Nirmal Char and 65 from Udaynagar Colony Char. Random Sampling method was followed during household survey in the both study sites. The total study is based on collection of secondary data from all relevant literatures and reports and primary data collected through household survey. The results have been shown in tables and simple bar diagram.

AN ACCOUNT OF CHAR-DWELLERS' VULNERABILITY TO FLOOD HAZARDS

The chars are extremely vulnerable to both erosion and flood hazards due to their proximity to river. The effects of river-bank erosion and widening of the river channel on the people living in chars have remained significant. Most people living in chars shift their homes at least once every 6 - 7 years when the braided river channels change their configuration. In general about 20% of inhabitants of these two chars are displaced by bank erosion and consequent flood during an approximately 10-year period.

Empirical results of this study indicate that over two-third (76.9%) of the surveyed households in Nirmal char and over half (54.7%) of the surveyed households in Udaynagar Colony

Char suffered direct losses from the flood of 2000, 2005 and 2006. The remaining households in both char-lands suffered from indirect impacts. Household resources explain flood vulnerability patterns at Nirmal char and Udaynagar Colony. The relationship between household resources and flood vulnerability is that coping with and recovery from flood impacts demand financial reserves that can buffer the household from negative flood impacts. Hence, an examination of household position in terms of the economic and material resources, such as income earnings, housing type and assets, becomes critical.

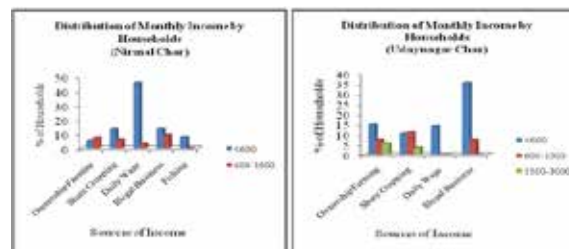


Figure 2a-b: (From left) 2a: Monthly income of surveyed households in Nirmal Char; 2b: Monthly income of surveyed households in Udaynagar Char

Data Source: Field Survey (November, 2010)

Survey results of Monthly Household Income of the study areas show that the percentage of people belonging to the lower income category is enormously high- 74.8% in Udaynagar Colony Char and 87.4% in Nirmal char. Quite expectedly these poor households would have insufficient reserves to buffer them against the negative impacts of future flood hazards. People with occupation of dependent nature, share cropping and daily wage earning, is more in number, particularly among lower income category. It asserts their greater vulnerability. People in Nirmal Char are more vulnerable than the people in Udaynagar Colony from in of these aspects.

Housing type and quality are important determinants of household flood vulnerability. A house in its most general sense is a human-built dwelling with enclosing walls, a floor, and a roof. As measures of flood vulnerability, the nature of building materials and the overall amenities associated with the house add to its quality. Housing quality determines whether the house would withstand or not the massive power of flood water.

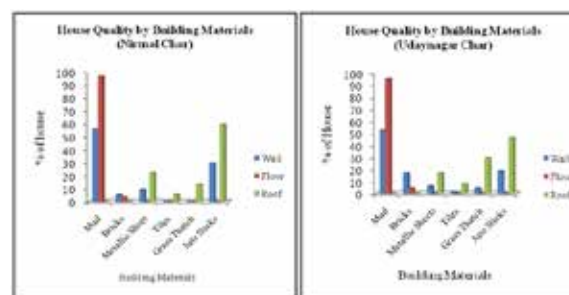


Figure 3a-b: (From left) 3a: House quality by building material in Nirmal Char; 3b: House quality by building material in Udaynagar Char

Source: Field Survey (November, 2010)

In terms of building materials of the households more than 98 per cent and 50 per cent of the surveyed houses in both the chars are of mud floor and mud wall respectively along with considerable percentages of houses having roof made of grass thatch and jute sticks. This phenomenon makes the houses vulnerable to flood and erosion also. Not only because they are unable due to their poverty but also because they

do not invest intentionally accepting the fate that they will have to re-build their houses after the destruction of their existing houses due to flood. This is one form of adjustment with the menace of flood hazard.

Table 1: Households' Access to Amenities in the study areas

Access to amenities	Udaynagar Colony N=54	Nirmal char N=65
	Power Water Sanitation	Power Water Sanitation
Kerosene	54 - - (100%)	65 - - (100%)
Public Tube-well	- 39 - (72.2%)	- 61 - (93.8%)
Private tube-well	- 15 - (27.8%)	- 04 - (6.2%)
Toilet inside	- - 05 (9.3%)	- - 03 (4.6%)
Toilet open space	- - 49 (90.7%)	- - 62 (95.4%)

Source: Field Survey (November, 2010)

In terms of amenities, Table 1 indicates a higher proportion in both chars public tube-well for drinking water and open space for toilet. There is no electricity in both the study sites. They never can dream about the gas for their cooking purpose. People are virtually living without minimum basic amenity. Poor standard of living and poor state of hygiene coupled with lack of health facilities make the lives of these people crippled with poor health and almost primitive lifestyle. The most pathetic face of vulnerability lies in this darkness.

Table 2: Likert Scale Response Table of Perceived Household Economic Distress

Economic Distress indicator	Udaynagar Colony N=54					Nirmal char N=65				
	Response in Likert scale									
	SD	D	NO	A	SA	SD	D	NO	A	SA
Whether Enough money to buy a house	49 (90.7%)	05 (9.3%)	-	-	-	65 (100%)	-	-	-	-
Whether Enough bank savings	54 (100%)	-	-	-	-	65 (100%)	-	-	-	-
Whether Poorer than before	-	04 (7.4%)	06 (11.1%)	-	44 (81.5%)	-	-	04 (6.4%)	-	61 (93.8%)
Whether Can survive a crisis	54 (100%)	-	-	-	-	65 (100%)	-	-	-	-
Household starving	-	-	-	30 (55.6%)	14 (44.4%)	-	-	54 (83.1%)	09 (13.8%)	02 (3.1%)
Whether land to plough	41 (75.9%)	13 (24.1%)	-	-	-	53 (81.6%)	06 (9.2%)	06 (9.2%)	-	-

Key: SD= Strongly Disagree; D= Disagree; NO= No Opinion; A= Agree; SA= Strongly Agree

Source: Field Survey (November, 2010)

In Table 2 the respective responses of char inhabitants it is reflected that there are incapability to buy a house, inadequate bank savings, lack of capacity to survive a crisis, inaccessibility to land to plough for all the dwellers of the study sites. Hence, they did not have an option of moving into a nearby safe area. In both areas, for instance, all the inhabitants felt they did not have enough financial capital to procure a house. Majority of them agree that they are poorer than before and that they are starving.

Cultural norms regarding family size also play an important role in determining flood vulnerability. In these two chars the average estimated number of children is four. The overall household size (i.e. children plus other dependents) is six. This finding implies that the overall typical family type is extended rather than nucleated. Households with many dependents and children are likely to encounter greater financial obstacles than smaller families when coping with flood impacts. Coupled with other variables described, high dependency ratios affect negatively the capacity of the household to secure sustainable livelihoods and the recovery after hazards, and hence become vulnerable.



Plate 1: Flood in the study sites
Source: Field Survey (September, 2010)

CONCLUSION

The main components of losses due to flood are damage to houses and loss of livestock and crops. Besides, these physical damages, people living here face the problem of resettlement. When both houses and lands are eroded or remain submerged round the year within the char, the affected char people of a village use to move together retaining the same village name or samaj (society) to a new location. One social arrangement that may or may not be linked with this type of community relocation is to make a house on someone else's land (uthuli) without paying rent. Floods in the range of 0.5-1m above plinth level tend to result in the total loss of kutch house walls. Loss of walls may permit floods to flow through a house and damage all the limited assets. Shelter as a basic capital asset is a critical issue for char people during floods. As flood levels rise more people are forced to leave their homes. It was found that in flood depth of about 0.75-1 m a half or more of char households evacuate home. Most people move to relatives' house or to embankments; these places may be in the same mouza or much further away. No rehabilitation programme, worth mentioning, is done for these victims.

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