Impact of riverbank erosion: A case study

Tuhin K Das[1]
Sushil K Haldar[2]
Debaprasad Sarkar[3]
Marion Borderon[4]
Stefan Kienberger[5]
Ivy Das Gupta[6]
Sangeeta Kundu[1]
Debarati Guha-Sapir[7]

[1] Planning and Development Unit, Jadavpur University, India

[2] Department of Economics, Jadavpur University, India

[3] Department of Economics, Barrackpore Rastraguru Surendranath College, India

[4] Department of Geography and Regional Research, University of Vienna, Austria

[5] Department of Geoinformatics – Z_GIS, University of Salzburg, Austria

[6] Department of Economics, Bhawanipur Education Society College, India

[7] Department of Public Health, University of Louvain, Belgium

Author correspondence:
Tuhin K Das
Planning and Development Unit
Jadavpur University
India
Email: tuhin22@hotmail.com

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Abstract

Human displacement is liable to occur in riverside regions where people are vulnerable to riverbank erosion. This vulnerability depends on factors such as population density and the economic conditions of the region's population. Short-term socioeconomic impacts on the displaced population include loss of home, agricultural land, jobs and assets. There will also be long-term socioeconomic impacts on the displaced population, including direct impacts on their living conditions and indirect impacts on human health and development, such as schooling for children and the health of mothers and children. Generally, short-term impacts are assessed in terms of needs for ex post assistance. However, the long-term socioeconomic impacts of riverbank erosion are rarely assessed from a policy perspective. The present study assesses these long-term impacts of bank erosion along the River Ganges. Analysis of survey data showed that the long-term socioeconomic impacts are severe, including increased income, or expenditure, poverty and also human poverty, in terms of poor living conditions, health and education. This paper concludes with a discussion of rehabilitation policy based on the survey results.

Keywords: *riverbank erosion, socioeconomic impact, displacement, human poverty, rehabilitation policy*

Assessment of socioeconomic impacts is a major task in disaster management. Such an assessment helps to identify affected sectors and to quantify financials needs for recovery and reconstruction. This is a difficult task, as some of the impacts have long-term consequences, as in the case of riverbank erosion (Haque, 1997; Baki, 2014). Short-term socioeconomic impacts are loss of home, agricultural land, jobs and assets (Refugee and Migratory Movements Research Unit, 2007). Long-term socioeconomic impacts include direct effects on the living conditions of affected populations and indirect effects on human health and development, also referred to as the accumulation of human capital, which includes schooling of children and health status of mothers and children (Wisner, Blaikie, Cannon & Davis, 2003; Das, Haldar, Das Gupta & Sen, 2014).

Asia's high population density and poor economic conditions exacerbate the impacts of natural disasters. A considerable section of the population lives along the banks of meandering rivers and in other high-risk zones. People who live near riverbanks are often the victims of bank erosion which threatens their personal safety and shelter as well as sources of their livelihoods (Brouwer, Aftab & Brander, 2006). India is no exception. Poverty drives many residents to live on increasingly eroded riverbanks, causing them to be repeatedly displaced. The settlements they live in are extremely humid (Jolly, 2013). The populations living there nonetheless seem willing to bear the impacts of recurrent natural hazards (United Nations International Strategy for Disaster Reduction, 2008).

The worst examples of riverbank erosion in India, with the most severe long-term impacts on human life, are found mainly along the Ganges and Brahmaputra rivers. The Ganges is a long river flowing through many Indian states and carrying a very large volume of water. However, there are only a few places affected by severe erosion. Flooding and erosion problems are most

serious in the lower reaches of the Ganges, particularly in West Bengal.

Especially over the last few decades, the Ganges has frequently changed course along the northern river-front of West Bengal. According to Sihha and Ghosh (2011), this is largely due to unabated bank erosion. In Malda district, upstream of the Farakka Barrage, the river has suffered extensive erosion along its left bank, even though it has been strongly protected over the same period. This kind of severe erosion is widespread throughout the river's course in West Bengal. One of the main reasons for this is the Farakka Barrage, a dam on the Bhagirathi River in West Bengal, about 10 kilometres from India's border with Bangladesh. The dam was built to divert water from the Ganges to the Hooghly River during the dry season, to flush out the silt from Kolkata harbour. It is now generally accepted that the Farakka Barrage has increased the intensity of bank erosion on the Ganges in West Bengal (Rudra, 2010). This is highly problematic where, according to official reports, an average of eight square kilometres of West Bengal is engulfed by the Ganges each year.

Countries are affected by riverbank erosion to different extents, leading to varying degrees of landscape degradation and environmental and socioeconomic impacts. In Papua New Guinea, for example, people have been displaced permanently due to the erosion of the Busu River (Sekac & Jana, 2014). In Serbia, erosion of the banks of the Kolubara River has had an impact on the agricultural population and settlements (Dragicevic, Tosic, Stepić, Živković & Novković, 2013). The loss of agricultural land to erosion along the Nile in Africa has led to a reduction in agricultural production (Ahmed & Fawzi, 2009). Riverbank erosion is also observed on the Waikato, Avon and Heathcote rivers in New Zealand (Mabin, 2007; Roper-Lindsay, 1994); the Mississippi, Missouri and Haw rivers in the United States (Briaud et al., 2007; Macfall, Robinette & Welch, 2014); the Murray, Darling and Gordon rivers in Australia (Hughes & Prosser, 2003; Bradbury, 2013); and the River Danube in Europe (Jones, Eldridge, Pedro Silva & Schiessler, 2007; Szalai, Balogh & Jakab, 2013). In some of the above cases, erosion has led to the loss of farmland and threatened roads, houses and a range of riverside services. In all cases, the extent of impacts on human settlements in any riverbank erosion situation depends on the population density and economic conditions of the people in that region. Table 1 shows that people in countries with a higher population density and lower per capita income are at higher risk of natural disasters. Risk in this table has been determined on the basis of each country's vulnerability and exposure to natural hazards (Butenop et al., 2013).

Table 1.
Population Density and Economic Conditions in Different Countries

Countries	Population density (people per sq. km of land area)[1]	Per capita income (international dollars)[2]	Disaster risk (%)[3]
Australia	3	47,389	4.51
Bangladesh	1,237	3,607	19.81
Egypt	92	11,850	2.34
Germany	234	46,893	3.24
Hungary	109	26,222	5.69
India	441	6,162	7.17
New Zealand	17	36,172	4.69
Nigeria	200	6,108	8.32
Papua New Guinea	17	2,652	15.90
Serbia	81	13,671	7.53
United States	35	55,805	3.99
Vietnam	296	6,024	12.81

Sources: [1]World Bank (2017); [2]International Monetary Fund (2016); [3]Butenop et al. (2013)

Objective of the Study

Unlike other natural disasters, there is very little quantitative information on the long-term socioeconomic impacts of riverbank erosion. The present study represents an attempt to remedy this. From a broader perspective, long-term impacts include not only income or expenditure poverty but also damage to other aspects of human development, like health, education and living conditions (United Nations Development Programme, 2010). The United Nations Development Programme (UNDP) (2010) have assessed long-term socioeconomic impacts using the following indicators:

(a) Economic conditions
(b) Access to better living conditions
(c) Educational attainment
(d) Health conditions

Indicator (a) has been evaluated using occupational patterns and poverty indices. Indicator (b) has been assessed by observing the structure of houses, the existence of improved sanitation, the use of clean energy and safe drinking water, the possession of vehicles, etc. School enrolment data and data concerning minimum years of school education constitute indicator (c).

Indicator (d) has resulted from assessing the nutritional status of mothers.

The present study is based on protocol development and a field survey carried out in 2014 and 2015. This methodology appears to usefully assess the long-term socioeconomic impacts of riverbank erosion in vulnerable regions. It may be useful for framing and implementing an appropriate rehabilitation policy for displaced people. Such a policy would embrace both short-term ex post assistance and the long-term rehabilitation of homeless and landless people who are deprived in terms of the above four indicators (Brookings-Bern Project on Internal Displacement, 2008).

Method

Five community development (CD) blocks on the left bank of the River Ganges in Malda district were affected by erosion at the time of this study. The most affected CD blocks were Manikchak, Kaliachak-1 and Kaliachak-2. The Development and Planning Department (2007) reported that the inhabitants of 236 riverine villages had lost their arable land holdings and that nearly 38,319 acres of prime cropland had been swallowed by the River Ganges, as shown in Table 2. Displaced families were resettled at several sites in Manikchak and Kaliachak-2 CD blocks. Out of these two CD blocks as shown in Figure 1, Kaliachak-2 was selected for the field survey. Exact statistics on resettled households in this CD block were not obtained. However, a survey using global positioning system (GPS) loggers (Borderon, Kienberger, Kumar, Oliveau & Das, 2017) had provided information on the spatial distribution of the resettled households in Kaliachak-2.

Table 2.
Estimated Impact of Riverbank Erosion in Malda District

CD Block	Total Area Eroded [acres]	Total Number of Families who Have Lost Land
Manikchak	13204.02	3330
Kaliachak (1 and 2)	25114.67	7378
Total	38318.69	10708

Source: Development and Planning Department (2007)

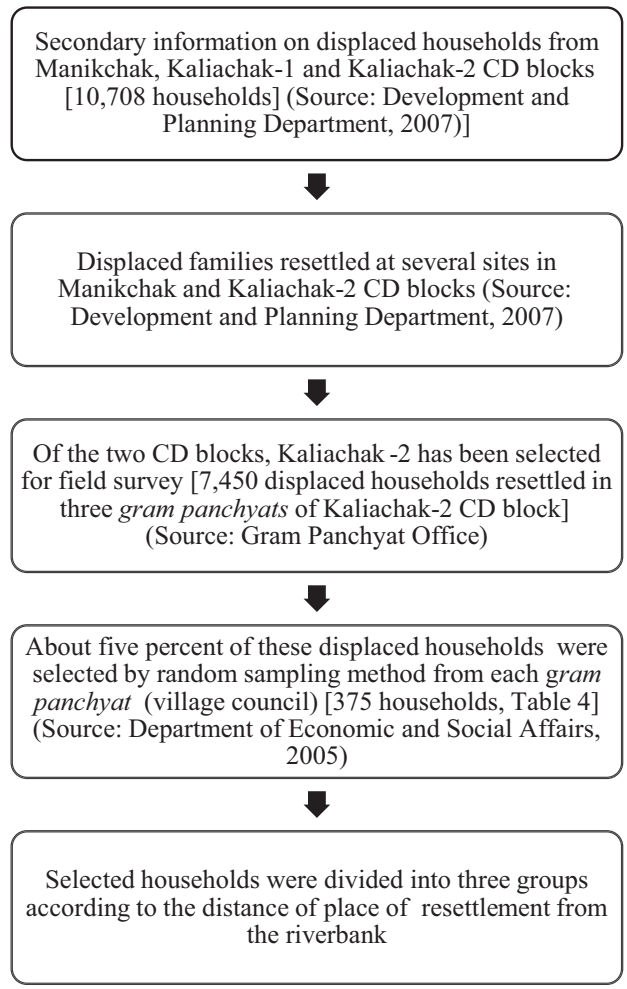

Figure 1. Study methodology

Unpublished data from the *gram panchayat* (village council area) office were used for household sampling in Kaliachak-2. This data is shown in Table 3. About 7,500 displaced households were resettled in Uttar Panchanadpur-1, Uttar Panchanadpur-2 and Bangitola *gram panchayat* of Kaliachak-2 CD block. About five percent of these displaced households from each *gram panchayat* were surveyed using a random sampling method. The survey was based on a comparatively small sample size, instead of a sample size determined for one particular indicator, for example, the income sample used by the Department of Economic and Social Affairs (2005). Instead, the

Table 3.
Number of Households in Gram Panchayet Taking Refuge from Riverbank Erosion

Zila Parisad (District Council)	CD Block	Gram Panchyet	Total Households (HHs)	Number of Original HHs	Number of Displaced HHs
Malda	Kaliachak-2	Uttar Panchanadpur-1	4100	660	3440
		Uttar Panchanadpur-2	3115	2740	360
		Bangitola	7220	3540	3680
TOTAL		3 GPs	14435	6985	7450

present study focuses on several indicators: household expenditure, educational level, and health status.

The current paper refers to households used as proxies for internally displaced persons (IDPs). These households were divided into three groups according to the distance between their place of resettlement and the riverbank. In the selected sample, nearly 46 percent of displaced households were living within one kilometre of the riverbank. Nearly 26 percent were living within 1 to 3 kilometres, and 28 percent were resettled more than 3 kilometres from the riverbank. The displaced households were grouped as follows:

Group I: Resettled within 1 kilometre of the riverbank

Group II: Resettled 1-3 kilometres from the riverbank

Group III: Resettled more than 3 kilometres from the riverbank

This study commenced on the first of March 2015, after receiving ethical clearance from Jadavpur University.

Analysis

The simplest proxy for measuring deprivation is unidimensional income, or expenditure, poverty. According to this measure, a person is poor if their consumption or income level falls below the minimum that is necessary to meet basic needs. This minimum level is usually called the *poverty line*, *subsistence level* or *threshold level* of income or expenditure and varies across time and place. One widely used measure of income, or expenditure, poverty is the head count ratio or index (HCR), which measures the proportion of the population that is counted as poor. Two advantages of this measure are that it is simple to construct and easy to understand. However, the HCR has also been criticized for failing to reflect the depth and severity of poverty. On the other hand, the poverty gap index (Sen, 1976) and the Foster-Greer-Thorbecke (FGT) index (Foster, Greer & Thorbecke, 1984) both attempt to address the severity and depth of poverty. The above three indices are calculated as follows.

HCR measures the proportion of the population that is counted as poor. Mathematically, it can be expressed as:

$$P_h = \frac{1}{N}\sum_{i=1}^{N} I(y_i < z) = \frac{n^*}{N}$$

where $I(\cdot)$ takes on a value of 1 if expenditure y_i, called the welfare indicator, is less than the poverty line z. Otherwise it takes on a value of 0. N = total population; z = poverty line; $n^* = N_p$ = number of poor in population.

The poverty gap index measures the extent to which individuals on average fall below the poverty line, and is expressed as:

$$P_g = \frac{1}{N}\sum_{i=1}^{N}\left(\frac{z-y_i}{z}\right) I(y_i < z) = \frac{1}{N}\sum_{i=1}^{N_p}\left(\frac{z-y_i}{z}\right) = HCR.R$$

It is also called the depth of poverty index, where:

$$HCR = \frac{n^*}{N} \text{ and } R = \left(\frac{z-\overline{y_p}}{z}\right)$$

The FGT index is a general formula for gauging poverty, calculated as:

$$P_{FGT} = \frac{1}{N}\sum_{i=1}^{Np}\left(\frac{z-y_i}{z}\right)^{\alpha}$$

This formula uses α as the sensitivity parameter, with the advantage that this can take into account both the poverty gap and inequality among the poor. Inequality among the poor is captured through the distributional changes within the poor segment of the population. If α=0, P_{FGT} represents head-count ratio (HCR) and if *α*=1, P_{FGT} indicates the poverty gap index.

In the same way, if *α*=2, the FGT index indicates the severity of poverty. This is also called the squared poverty gap index. This means that, for *α*=2:

$$P_{FGT} = (HCR).[R^2 + (1-R)^2.(CVP)^2]$$

Here, *CVP* measures the coefficient of variation of income of the poor. This formula is used if the policy is to minimize this inequality. However, the formula is not widely used in this way because it is not easy to interpret. In sum, the FGT index can indicate prevalence, depth and severity of poverty if *α*=0, 1 or 2 respectively. This measure shows how much would have to be transferred to the poor to bring their incomes or expenditures up to the poverty line. Therefore, it can be interpreted as the cost of eliminating poverty relative to the poverty line.

Measures of poverty using income or expenditure reflect one side of the socioeconomic impact of a disaster. Non-income measures of poverty, such as human poverty, represent another aspect of long-term socioeconomic impacts. Human poverty comprises deprivation in several basic dimensions of human development. Various indicators have been suggested to measure human poverty. In this paper, however, human poverty is indicated by descriptive statistics. These take into account the long-term socioeconomic impact across the fields of health, education and standard of living. Access to better life conditions represents standard of living. Percentage of displaced persons enrolled in schools and having completed five years of education by age group represents access to education. Nutritional status of mothers in households represents access to healthcare.

A common anthropometric indicator for adult nutritional status is *body mass index* (BMI). This index is simply calculated as the body weight (in kilograms) divided by the square of the height (in metres). The nutritional status of a person is determined as follows:

– A person is said to be suffering from mild malnutrition if 17.0 ≤ BMI < 18.5
– A person is said to be suffering from moderate malnutrition if 16.0 ≤ BMI < 17.0
– A person is said to be suffering from severe malnutrition if BMI < 16.0
– The nutritional status of a person is said to be normal if BMI ≥ 18.5

If BMI exceeds 24.9 then a person would be categorized as overweight, while a BMI of 30 or above is categorized as obese. Regardless of category, due to differences in muscle mass and genetic predispositions, the BMI is most useful for studying populations rather than discrete individuals.

Results and Discussion

Displaced households in Malda district inhabited unauthorized places such as roadsides and private mango orchards. Some of them, however, stayed near the riverbank in spite of the risk of further erosion. The households who resettled near the riverbank were more dependent on the river. Their river-dependent occupations included fishing and the cultivation of fertile riverbank soil. It was noted that most of them did not own any agricultural land. The newly emerged fertile land along the river was not demarcated and ownership had not been established. The displaced people were cultivating this land on a temporary basis (Kumar-Rao, 2015), but they failed to disclose this in the survey, most probably because their activities were unauthorized. The occupational pattern of displaced persons according to distance from the riverbank is shown in Table 4.

It is interesting to note that the occupational pattern of the displaced persons changed considerably as they shifted further from the riverbank. *Other* occupations include rickshaw/van-pulling, vending, etc. Such job opportunities were available as they moved nearer to towns or market centres. Those types of jobs were not well specified and seasonal, for example: During the mango season.

These occupations provided displaced households with a livelihood. Field surveys have been conducted in rural areas in the state of West Bengal. The poverty line in the rural areas of this state was found to be 934.10 Indian rupees per capita per month (Planning Commission, 2014). This figure was used for poverty analysis in the current study. Economic deprivation was observed through the poverty indices shown in Table 5. The poverty level of the three groups was more or less same, especially in terms of *squared poverty gap index*, or severity of poverty. Group-I IDPs were somewhat better-off in terms of the three indices. This is one reason why displaced people preferred to resettle near the riverbank. The Group-II IDPs, most of whom were engaged in day-labour, were observed to be in the worst situation.

Regarding living conditions, all the households in the survey had electric power. However, the roads through their villages were not in good condition. Even the major roads for accessing these villages were almost impassable during the three to four months of the monsoon. The main source of drinking water was tube-wells. However, during the monsoon season some households, mainly those near the riverbank, faced serious problems in collecting drinking water from those sources as the villages were flooded. Only firewood and dung-cakes were available for cooking fuel, rather than cleaner energy sources such as gas and electricity.

Houses were generally made of bamboo and mud. Only a few

Table 5.
Poverty Indices

Household Group	Headcount index	Poverty gap index	Squared poverty gap index
I	0.79	0.31	0.15
II	0.98	0.41	0.21
III	0.81	0.33	0.17

Table 4.
Distribution of Surveyed IDP Households Settled at Different Distances from the Riverbank and Distribution of their Occupational Pattern

Groups	Distribution of surveyed households in the sample	Occupational pattern of displaced households (%)				
		Labor	Cultivation	Fishing	Service	Others
I	173 (46.13%)	67.31	0.96*	26.92	-	4.81
II	97 (25.87%)	83.06	-	1.69	-	15.25
III	105 (28.00%)	69.70	-		1.52	28.78

Note: * This percentage appears to be an underestimate. Group-I households were reluctant to disclose their occupation as ownership of the newly emerged land was unclear.

Table 6.
Access to Better Life Conditions Among Displaced Households

Groups	Distribution of households (%)								
	Electricity	Cooking fuel (firewood)	Access to safe drinking water (tube-well)	Access to improved sanitation	Poor road condition during monsoon	Houses with cemented floor	Possession of mobile phone	Possession of motorcycle	Possession of television
I	100.00	100.00	100.00	48.94	100.00	0.00	98.34	1.06	4.26
II	100.00	100.00	100.00	79.25	100.00	3.77	100.00	1.89	0.00
III	100.00	100.00	100.00	92.98	100.00	8.77	54.39	3.51	7.02

Table 7.
Average Distance of Social Infrastructure from Villages Inhabited by Different Groups of IDPs

Groups	Distance (in km) from villages of IDPs of:							
	Primary School	High School	Higher Secondary School	Nearest Allopathic Doctor	Primary Health Centre	Rural Hospital	Sub-Divisional Hospital	Bus/ Auto/ Van Stand
I	1.24	2.01	2.02	1.30	1.26	4.22	22.19	1.57
II	0.38	1.17	1.26	0.81	0.83	2.18	16.51	0.47
III	1.15	2.57	2.54	0.89	0.61	3.96	19.21	0.14

houses, 2.45 percent of the total sample, were brick-built with a cement floor. This is shown in Table 6. None of the surveyed households possessed a sanitary latrine. Sanitation was observed to improve the further away they were from the riverbank. Less than 49 percent of households in villages near the riverbank possessed sanitary latrines, compared to 93 percent in villages more than three kilometres from the river.

All Group-II households possessed mobile phones though none of them owned a television. The reverse situation was observed among Group-III households. Only a few households among the three groups owned a motorcycle, and the number of motorcycles increased the further away they were from the riverbank. None of the surveyed households possessed any other appliances, such as a computer, refrigerator, washing machine.

The basic requirements for access to education and health services marked the presence of social infrastructure in each neighbourhood. In this regard, Group-II was in a favourable position, as shown in Table 7. There were primary schools and primary health centres (PHCs) within one kilometre of the villages occupied by Group-II households. High schools, higher secondary schools and rural hospitals were also closer to their villages. Regarding physical infrastructure, Group-III households enjoyed better transportation facilities than the other groups.

As shown in Table 8, survey data revealed that some members of displaced households had never enrolled in school, despite the existence of suitable education infrastructure. The percentage of persons in this circumstance varied according to age group. A higher level of school enrolment was observed among school-aged individuals (7-12 year and 13-18 year age groups) in Group-II, although many remained unenrolled. The group with the lowest level of enrolment was Group-I. One reason for this difference might be the lack of primary and high schools in the vicinity. A significant number of children in the 10-12 year age group had not completed five years of school education. This situation

Table 8.
Percentage of Persons Enrolled in School and Having Completed Five Years of Education by Age Group

Groups	Enrolled in school				Completed 5 years of education			
	Age Groups (in years)				Age Groups (in years)			
	7-12	13-18	19-24	25-30	10-12	13-18	19-24	25-30
I	71.60	52.27	36.11	19.51	63.89	50.00	33.33	17.07
II	91.11	76.79	35.29	4.35	80.95	76.79	35.29	4.35
III	80.77	55.26	46.88	52.63	71.43	55.26	40.63	36.84

was more marked among older age groups. Less than one-third of the population in the 19-24 age group had been to school. However, rates of school attendance were higher among Group-III households.

Data were collected to determine the nutritional status of mothers in the surveyed households, as a proxy indicator for the health of displaced persons. The BMI of mothers in every surveyed household was computed and is presented in Table 9. The computed results suggest that 14.12 percent of Group-I mothers, 12.24 percent of mothers in Group-II and 10.20 percent of those in Group-III were suffering from mild malnutrition. From the viewpoint of nutritional status as part of human poverty, the people in Group-I were the most deprived of all the displaced households in this region.

Table 9.
Body Mass Index (BMI)

Groups	Average BMI of mothers (in the age group 15-49 years)	Coefficient of BMI variation	Percentage of mothers suffering from mild malnutrition
I	22.35	18.22	14.12
II	23.20	16.36	12.24
III	21.89	15.69	10.20

The above analysis suggests that the displaced people were more or less economically poor. Their living conditions were unsatisfactory, the social infrastructure facilities in the new locations were inadequate, children remained uneducated and mothers were suffering from mild malnutrition. In sum, the IDPs were experiencing human poverty. In these circumstances, it is important to generate policies that might lead to their rehabilitation and human development.

Conclusion

Displacement takes place in regions where people are more vulnerable to natural disasters (Wisner et al., 2003). Riverbank erosion provides one example of this (Das et al., 2014). Asian countries tend to be more vulnerable to riverbank erosion due to their high population density and poor economic conditions. Large sections of the population in these countries live along the rivers and are more likely to be affected by bank erosion.

Bank erosion has both short- and long-term impacts on IDPs' livelihood. The short-term socioeconomic impact of riverbank erosion is immediate economic loss, i.e. loss of land, assets and jobs (Refugee and Migratory Movements Research Unit, 2007). Disasters also have longer-term, indirect impacts, and these are the ones that are analysed in this study, with reference to Haque (1997) and Baki (2014). The findings of the present study should be helpful in formulating appropriate rehabilitation policies in a range of regions beyond the current research context. Field survey analysis and other data showed how severe the long-term impacts of riverbank erosion can be, consisting not only of income/expenditure poverty but also of human poverty among the displaced people. Surveyed households had been forced to move from their places of origin and take shelter elsewhere. They remained uneducated, unhealthy and unemployed due to this disruption. Unhealthy mothers gave birth to undernourished children. Uneducated young people had no access to better jobs. It is important to consider that educational attainment, particularly higher education, plays a significant role in reducing income inequality (De Gregorio and Lee, 2002). Due to lack of education, it appears that the current populations displaced by riverbank erosion could hardly attain a minimum level of livelihood. Their living conditions were poor and they had no way of improving them.

The survey analysis indicated that some of the displaced persons continued to live on the riverbank, within 500 meters of the river, despite the high risk of further bank erosion and flooding. Their risk-taking behaviour can be explained by their wish to continue their previous occupations, such as fishing and the cultivation of newly emerged land. This variable phenomenon leads to multiple displacements of IDPs. IDPs who moved further away from the riverbank were forced to change their occupations, and they were economically more disadvantaged than those who stayed nearer the river. This is reflected in the poverty indices of the different communities. It therefore appears that there is a trade-off between risk-taking and income-earning.

What is the best policy to adopt in this context? *Coastal regulation zones* (CRZ) have been declared in almost all countries. However, as discussed earlier, large sections of the population in almost all Asian countries remain in high-risk zones, including the banks of meandering rivers, due to poverty and population expansion. India is no exception and relevant socio-economic policies have been put in place. It is the implementation of these policies that needs to be adjusted to offer alternative means of livelihood for vulnerable people.

There can be no doubt that people will continue to reside along riverbanks and that riverbanks will continue

to erode. Under these circumstances, there needs to be a policy in place for the rehabilitation of people affected by bank erosion, as shown in Figure 2. In India, there are policies concerning ex post assistance for people affected by natural disasters, especially floods, cyclones and earthquakes. These people receive a relief package designed to alleviate the short-term impacts, including the repair or rebuilding of their houses and compensation for damage to their crops. Policy for refugees is somewhat different. Affected people are given government assistance for housing and means of livelihood in new locations.

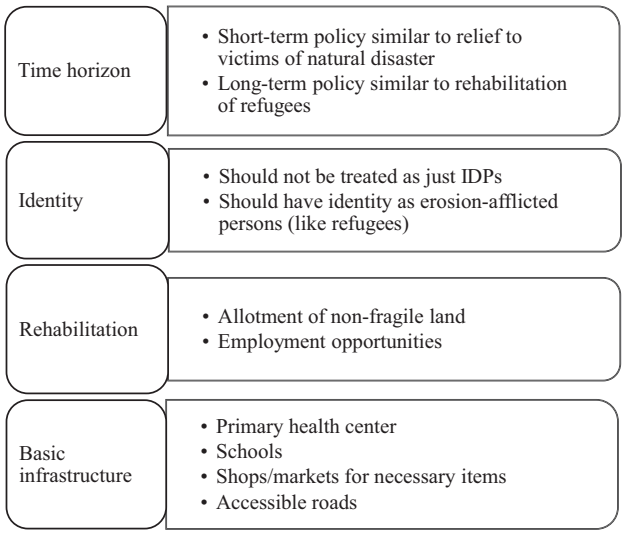

Figure 2. Policy formulation guidelines for ex-post assistance to riverbank erosion victims

The outcome for victims of riverbank erosion is similar to that for refugees. Erosion victims lose their houses and means of livelihood, including agricultural land, poultry, cottage industries and shops. Since these people are displaced, government policy should clearly define their status so that they can enjoy the same civic rights as other citizens in their country, including education, health, food, employment and voting rights. To be precise, policy should not merely be directed at ex post assistance to populations affected by natural disasters, but should also encompass the kind of rehabilitation packages that are provided for refugees when they become homeless and landless (Brookings-Bern Project on Internal Displacement, 2008).

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