RIVER BANK EROSION AND ITS IMPACT ON OCCUPATIONAL STRUCTURE OF BRAHMAPUTRA VALLEY DWELLERS OF MORIGAON DISTRICT, ASSAM

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ABSTRACT

The Brahmaputra is a major river system of the world characterized by exceedingly high rates of basin erosion. It also provides a classic example in which high erosion rates of the drainage basins results in rapid aggradations of the channels and over bank flooding. Besides being a major threat to continued productivity of the land, soil erosion is now viewed as a major 'non-point' source of environmental pollution.

Assam is predominantly rural in nature, and thus there exist a very limited scope for job opportunity outside the agricultural sector apart from the government jobs and services. This is more so in Morigaon district of Assam. Agricultural labour is seasonal work with long period of unemployment and under employment during the year. Thus their income had shown a downward trend in their new environment. It may be one of the causes for shift of occupational structures of the erosion affected farming people towards activities outside the primary sector. The erosion displaced persons of the district are found to be over-represented in the informal sector because the flexibilities of work involved in such activities. It is also observed within the primary sector that the occupational pattern of the erosion affected people, there is a move from agriculture as the primary livelihood to agricultural labourers, wage labourers in areas other than agriculture and various other occupations like rickshaw pullers, cart pullers, small or petty traders etc. in or outside the district.

The assessment of the occupational status of the erosion displaced people in the changing scenario in Morigaon district reveals that there is a significant transformation in occupation pattern and their income. The erstwhile marginal farmers vanished in the post erosion scenario while the proportion of agricultural worker declined.

Key Words: Morigaon, Basin erosion, Occupational structure, agriculture

INTRODUCTION:

The Brahmaputra is a major river system of the world characterized by exceedingly high rates of basin erosion. In many parts of the world, mostly belonging to the developing countries of the tropics and subtropics including India, the vastly increased erosion rates have already set a difficult-to-reverse chain reactions leading to degenerated environment, reduced agricultural productivity, increased runoff and accelerated siltation in rivers, reservoirs and lakes. The Brahmaputra River in Assam provides a classic example in which high erosion rates of the drainage basins results in rapid aggradations of the channels and over bank flooding. Besides being a major threat to continued productivity of the land, soil erosion is now viewed as a major 'non-point' source of environmental pollution (Goswami, 1985).

Large rivers particularly the Brahmaputra, the Ganga and their tributaries causes immense annual soil loss due to erosion. In many countries of the world, erosion process of soils due to winds, and floods have increased enormously. The total land area subjected to erosion throughout the world is estimated at 600 to 700 million hectares and this constitutes about half the total cultivated area of the world (Thorne, 1992).

Bank erosion of the river Brahmaputra is causing immense long-term destruction every year. The Brahmaputra and its tributaries comes down from the Himalayas and from its tertiary hills carrying enormous quantities of sediments and on reaching the plain these sediments are deposited on their own beds. The channels are thus filled up and the water in the following summers digs out different courses abandoning the earlier ones. Moreover, Brahmaputra valley and its adjoining region are seismically very active. The seismic instability of the region also contributes to such shifts. Erosion of the banks takes away valuable land, and destroys towns built on its banks and impoverishes the people affected. Thus also displaces the erstwhile farmers making them landless and the effected people have to make a shift of their occupational structure for earning their livelihood. Thus the present communication tries to elucidate the impact of bank erosion on the occupational structure of the Brahmaputra valley dwellers with special emphasis to Morigaon district of Assam.

METHODOLOGY AND DATA-BASE:

The study undertaken in Morigaon district of Assam. Primary data was collected through schedule questionnaire from three erosion effected zones to study the changes of occupational pattern and the adjustment strategies of the affected people.

The tabulated primary data is correlated with the secondary data obtained from different Government reports, documents and other published reports to arrive at the interpretation.

GEOGRAPHICAL AND CLIMATIC SETTINGS OF THE STUDY AREA:

The district Morigaon is located in the central part of Assam. In the south bank of Brahmaputra between 26^{o} 00′ N and 26^{o}40′ N latitude and 91^{o}59′ E and 92^{o}35′ E longitude with a geographical area of 1431.5 sq. km. accounting 1.99% of the total area of the state**.**

The catchments of the Brahmaputra excluding the Tibetan portion form an integral part of the monsoonal regime of South East Asia. Rainfall in the valley averages 230 cm annually with a variability of 15 to 20 per cent. The Himalayan sector receives 500 cm of annual rainfall, the lower ranges receives more rain than the higher areas. Soils in the Sub-Himalayan region developed on the Tertiary sandstones consist primarily of sands with admixtures of cobbles and boulders. Alluvial soils formed on recent river deposits occur in most parts of the valley. Considerable degradation of forests has occurred in the surrounding hills of the Brahmaputra valley due to reckless deforestation, widespread practice of shifting cultivation and other harmful human interferences.

Presence of hilly protruding rocks in the middle part of the Brahmaputra valley in Silghat area, the river flow maintains a hypercritical velocity and thus do not deposit its heavy silt load. Afterwards, the river enters in to the alluvial plain and fan out in to several channels so that the velocity drops in to sub-critical state and the river deposits its silt load. Further down the protruding escarpment of the Singri hill on the north bank obstructs the flow and creates a spur action by deflecting a major flow towards the south bank. As a result, the south bank is always subjected to bank erosion.

RESULTS AND DISCUSSION

Out of the 16 mouzas of the district 6 mouzas are situated in bank of the river Brahmaputra and are severely flood prone. All of these six mouzas are also affected by bank erosion in their northern boundaries. Among them Bokani, Bhuragaon, Laharighat, and Mairabari mouzas are worst affected as compared to the other mouzas due to bank erosion.

The continuous retirements and unabated erosion causes heavy loss to the valuable homestead and fertile agricultural lands, besides evacuation of thickly populated riparian. In the process over the years from 1969 to 2017, as many as 93 nos. of revenue villages and 10256.93 ha of land got obliterated due to unabated erosion. The mouza wise erosion is depicted in table-1.

Table- 1: Mouza wise Erosion affected villages in the Morigaon District wef 1969 to 2017

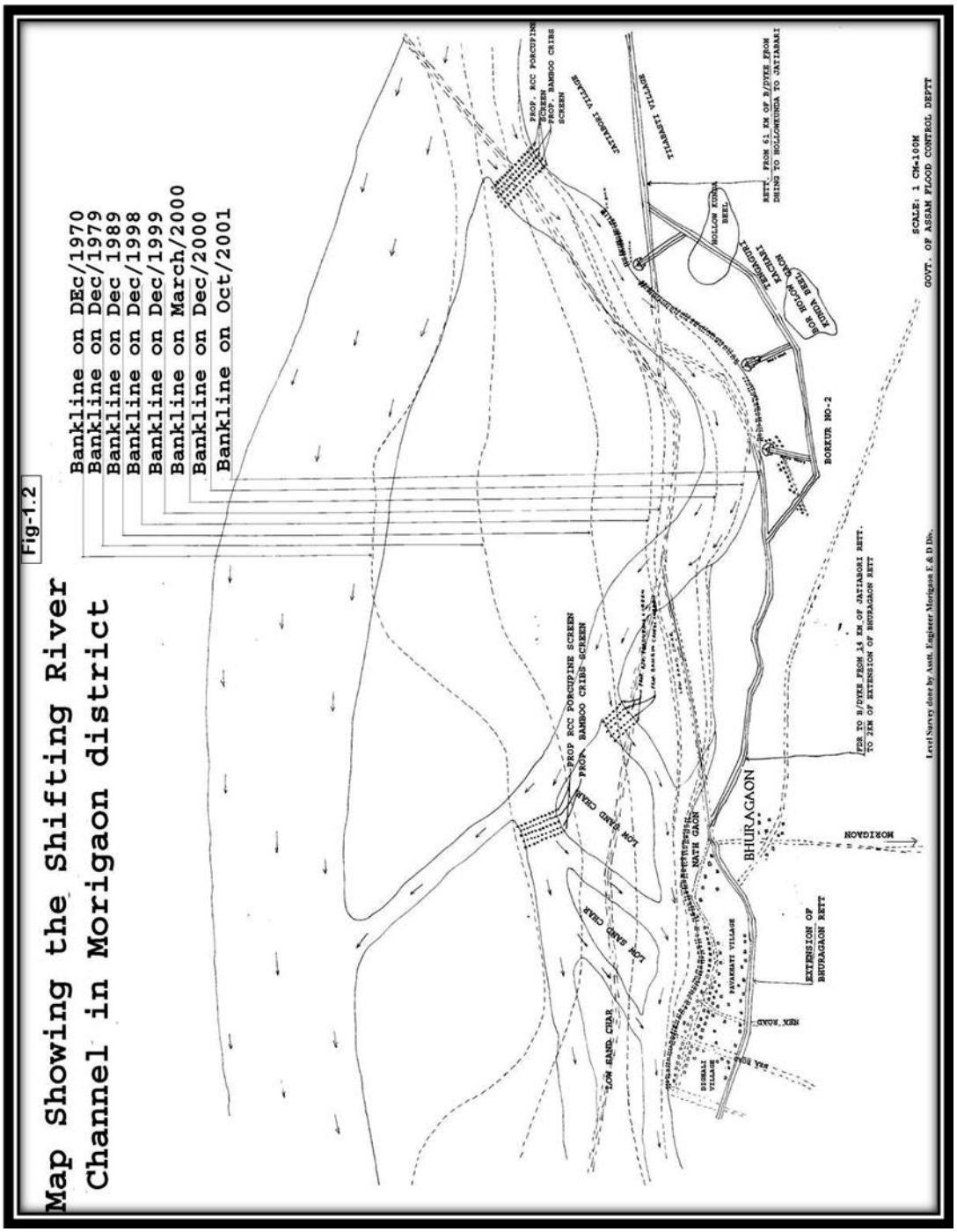
Name of the Mouza	No. of eroded villages		
	Completely	Partially	Total
Pokaria	2	5	7
Bokani	29	14	43
Bhuragaon	4	7	11
Laharighat	15	9	24
Mairabari	6	2	8
Total	**56**	**37**	**93**

Source: District Revenue Deptt., Morigaon, 2017

The damage caused by erosion is of permanent nature. Erosion has made thousands of people homeless and most of them shifted to the E&D embankments and P.W.D. roadside. They live a perilous life in the edge of poverty. Rehabilitation of these persons is a gargantuan problem as land is a scare commodity.

Many villages that have submerged due to bank erosion are currently not traceable. Along these villages large areas of agricultural land are also submerged in the river. The land revenue records of Bhuragaon, Laharighat and Mayang circle show that, since 1986 a total of 10,256.93 hectares of land have been lost due to river erosion. More than 80% of the lost land was agricultural land. The entire region of the district was once considered as the granary of middle Assam for production of food grains. But, due to flood and erosion, agricultural production is declining. The dislocated cultivators had to engage themselves as petty traders, rickshaw/ thela pullers in the nearby urban centers or as casual labourers in agricultural sectors for their livelihood.

Employment in any occupation depends upon various parameters. Any occupation involves certain range of responsibility and functions, which requires education, training and experience. As a rule, the level of education is directly proportionate to the share of main workers of the population. However, most of the displaced people were either illiterate or have education upto primary level only.



Morigaon district is predominantly rural in nature, and thus there exist a very limited scope for job opportunity outside the agricultural sector apart from the government jobs and services. The erosion displaced persons are found to be over-represented in the informal sector because the flexibilities of work involved in such activities. ILO (2002) defines main characteristics of the informal sector as ease of entry; reliance on local resources; family ownership; small-scale operations; labour-intensive work, using adaptive technologies; use of skills acquired outside school; an irregular and competitive market and possess development potential because of its flexibility and potential for creative responses to economic change. However, work in the informal sector is less remunerative and under conditions which are inferior to organised sectors' work and is highly vulnerable to workers due to the absence of workers' rights and social protection.

It is also observed that in case of the erosion affected people, there is a move from agriculture as the primary livelihood, to agricultural labourers, wage labourers in other areas than agriculture and various other occupations like rickshaw pullers, cart pullers, small or petty traders etc. in or outside the district. The trend of occupational structure of the affected people reflects their economic status also. Table- 2 shows the occupational structure and monthly income of the affected people prior to erosion.

Table- 2: Occupational structure and income of the respondents prior to erosion calamity

Occupation	Monthly earning (in Rs.)	Nos. of respondent	Percentage (%)
1. Marginal farmer	-----	412	68.6
2. Agricultural labourer	800-1050	47	7.8
3. Bonded or attached agricultural labour	50-200	12	2.0
4. Employee	4000-7000	59	9.8
5. Seasonal Agricultural worker	1100-1500	56	9.3
6. Others workers	600-900	14	2.3
	Total	**600**	**100**
Source: Primary field survey data, 2017			

The rehabilitated areas were most unprivileged areas in respect of the three most important indicators of development viz. health, education, and economic status. Most of the people (85%) of the area derived their livelihood mainly from the primary sector prior to erosion. However, flood and erosion had made the life of these farmers miserable by depriving them from their agricultural land and making the farm lands unusable for cultivation. The erosion displaced people transformed the farmers to agriculture labourers and also into wage labourers. It has been shown, the shift from cultivator to laborer status, can only be explained by loss of land for subsistence cultivation and inadequate growth of productive employment opportunities on family structure (Duvury, 1989). Agricultural labour is seasonal work with long period of unemployment and under employment during the year. Thus their income had shown a downward trend in their new environment. Table-3 shows the occupation and income of the respondents after their displacement.

Table- 3: Occupation & income of the respondents after displacement due to erosion

Occupation	Monthly income (in Rs.)	Nos. of respondent	Percentage (%)
1. Daily wage labourer	2000-3200	298	49.6
2 Construction/ Industrial labourer	2000-2300	70	11.6
3. Agricultural workers	1500-2500	78	13.0
4. Employee	4000-7000	74	12.3
5. Rickshaw puller	1500-1800	25	4.2
6. Vendors	1200-1800	55	9.2
Total		**600**	**100**
Source: Primary field survey data, 2017			

The assessment of the occupational status of the erosion displaced people in the changing scenario reveals that there is a significant transformation in occupation pattern and their income. The erstwhile marginal farmers vanished in the post erosion scenario while the proportion of agricultural worker declined from 85% to 22%. Most of the farmers were forced to become wage earning labourers after loss of their agricultural land.

The occupational structures of the erosion affected people are showing a change towards activities outside the primary sector. Table-4 shows that there are changes in occupational structure of the affected migrant people from farming activities in rural areas to wage earning activities in urban areas. It is also observed that there is a drastic reduction in the number of cultivators in the post erosion occupational pattern in rural areas.

The people those who migrated to the other areas under the minimum needs programs of the government and the people staying in the roadsides, embankments and the people not wanting to move to safer places from their own land which are located in the critical areas of the river became daily wage labourers in the nearby villages. Their monthly income also declined compared to their past income. In their original abode the affected people had land for growing food grains and thus were able to lead a better life. After erosion, more than 70 per cent of them became seasonal agricultural labourers and marginal farmers. The erosion affected people, who were rehabilitated by the government, were provided with insufficient land to be used for agricultural purposes. Table 4 and 5 depicts the changing occupational structure of self rehabilitated and government rehabilitated erosion affected people respectively.

Table- 4: Changing Occupational Structure of Erosion Affected People

Migration pattern	Name of the Village	OCCUPATION OF SELF REHABILITATED PEOPLE												
		Before Migration (in %)							After Migration (in %)					
		Farmer	Agri. Labour	Bonded Labour	Employee	Seasonal Worker	Others	**TOTAL**	Farmer	Daily Wage Labour	worker in Carriage industry	Employee	Vendor	Rickshaw puller	**TOTAL**
Rural to Rural	Taptala	63.2	10.5	0.0	5.27	21.1	0.0	**100**	7.9	65.8	0.0	15.8	10.5	0.0	**100**
	Barukati	57.5	35.0	5.0	0.0	2.5	0.0	**100**	12.5	82.5	0.0	0.0	0.0	5.1	**100**
	Bardia	91.4	8.6	0.0	0.0	0.0	0.0	**100**	28.6	62.9	0.0	0.0	8.6	0.0	**100**
	Bilarmor	78.4	5.4	0.0	0.0	16.2	0.0	**100**	10.8	78.4	0.0	0.0	10.8	0.0	**100**
	Total	**72.0**	**15.4**	**1.4**	**1.4**	**10.0**	**0.0**	**100**	**14.7**	**72.7**	**0.0**	**4.0**	**7.4**	**1.4**	**100**
Rural to Urban	Chenimari	64.7	20.6	5.6	0.0	8.8	0.0	**100**	5.9	38.2	32.4	5.9	8.8	8.8	**100**
	Basna-ghat	22.9	0.0	0.0	71.4	0.0	5.7	**100**	0.0	0.0	11.4	80.0	8.6	0.0	**100**
	Milanpur	41.9	11.6	14.0	23.3	0.0	9.3	**100**	0.0	32.6	7.0	32.6	14.0	14.0	**100**

	Na-bheti	42.1	0.0	0.0	34.2	23.7	0.0	**100**	5.3	18.4	15.8	39.5	10.5	10.5	**100**
	Total	**42.7**	**8.0**	**5.3**	**32.0**	**8.0**	**4.0**	**100**	**2.7**	**22.7**	**16.0**	**39.3**	**10.7**	**8.7**	**100**
Source: Primary field survey data, 2017															

Table-5: Changing Occupational Structure of Erosion Affected People

Migration pattern	Name of the Village	OCCUPATION OF GOVT. REHABILITATED PEOPLE													
		Before Migration (in %)							After Migration (in %)						
		Farmer	Agri. Labour	Bonded Labour	Employee	Seasonal Worker	Others	**TOTAL**	Farmer	Daily Wage worker in Carriage/industry	Employee	Vendor	Rickshaw puller	**TOTAL**	
Rural to Rural	Baragoni (Kustali)	77.3	9.1	0.0	0.0	13.7	0.0	**100**	0.0	72.7	0.0	0.0	18.2	9.1	**100**
	No3. Damal	91.7	0.0	0.0	4.2	4.2	0.0	**100**	10.4	14.6	70.8	4.2	0.0	0.0	**100**
	Langari-bori	75.0	0.0	0.0	0.0	15.0	10.0	**100**	15.0	55.0	10.0	0.0	10.0	10.0	**100**
	Hariabori	73.1	11.5	3.9	0.0	11.5	0.0	**100**	15.4	73.1	0.0	0.0	11.5	0.0	**100**
	Sukati-putahabi	71.8	0.0	0.0	0.0	18.8	9.4	**100**	0.0	81.3	18.8	0.0	0.0	0.0	**100**
	Kathani	84.3	7.9	0.0	0.0	3.9	3.9	**100**	19.6	70.6	0.0	0.0	9.8	0.0	**100**
	Barbori reserve	79.2	0.0	0.0	5.7	13.2	1.9	**100**	45.3	28.3	7.6	5.6	13.2	0.0	**100**
	Deoara-bori	81.8	0.0	0.0	18.2	0.0	0.0	**100**	9.1	27.3	0.0	18.2	18.2	27.3	**100**
Total		**30.0**	**4.0**	**0.7**	**3.0**	**9.7**	**2.7**	**100**	**17.3**	**51.7**	**15.3**	**3.0**	**9.3**	**3.3**	**100**
Source: Primary field survey data, 2017															

Summary:

The foregoing discussion about variation of the occupational structure is indicative of the fact that the erosion affected people were primarily farming community, engaged mainly in agricultural activities. It is also observed that their occupational structure has seen an abrupt change from farming community to wage earning occupations after the displacement. The share of workers in agricultural activities prior to erosion was 85 percent which has changed abruptly to occupations like wage labourers especially in the fields where there is demand for unskilled labourers. The share of unskilled workers after displacement became 87 percent in the urban sector. After displacement most of them are living a life of poverty.

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