

Vol II Issue IX

ISSN No : 2230-7850

---

Monthly Multidiciplinary  
Research Journal

# *Indian Streams Research Journal*

Executive Editor

Ashok Yakkaldevi

Editor-in-chief

H.N.Jagtap

---

## Welcome to ISRJ

**RNI MAHMUL/2011/38595**

**ISSN No.2230-7850**

Indian Streams Research Journal is a multidisciplinary research journal, published monthly in English, Hindi & Marathi Language. All research papers submitted to the journal will be double - blind peer reviewed referred by members of the editorial Board readers will include investigator in universities, research institutes government and industry with research interest in the general subjects.

### ***International Advisory Board***

Flávio de São Pedro Filho Federal University of Rondonia, Brazil	Mohammad Hailat Dept. of Mathmatical Sciences, University of South Carolina Aiken, Aiken SC 29801	Hasan Baktir English Language and Literature Department, Kayseri
Kamani Perera Regional Centre For Strategic Studies, Sri Lanka	Abdullah Sabbagh Engineering Studies, Sydney	Ghayoor Abbas Chotana Department of Chemistry, Lahore University of Management Sciences [ PK ]
Janaki Sinnasamy Librarian, University of Malaya [ Malaysia ]	Catalina Neculai University of Coventry, UK	Anna Maria Constantinovici AL. I. Cuza University, Romania
Romona Mihaila Spiru Haret University, Romania	Ecaterina Patrascu Spiru Haret University, Bucharest	Horia Patrascu Spiru Haret University, Bucharest, Romania
Delia Serbescu Spiru Haret University, Bucharest, Romania	Loredana Bosca Spiru Haret University, Romania	Ilie Pintea, Spiru Haret University, Romania
Anurag Misra DBS College, Kanpur	Fabricio Moraes de Almeida Federal University of Rondonia, Brazil	Xiaohua Yang PhD, USA
Titus Pop	George - Calin SERITAN Postdoctoral Researcher	Nawab Ali Khan College of Business Administration

### ***Editorial Board***

Pratap Vyamktrao Naikwade ASP College Devrukh,Ratnagiri,MS India	Iresh Swami Ex - VC. Solapur University, Solapur	Rajendra Shendge Director, B.C.U.D. Solapur University, Solapur
R. R. Patil Head Geology Department Solapur University, Solapur	N.S. Dhaygude Ex. Prin. Dayanand College, Solapur	R. R. Yalikal Director Managment Institute, Solapur
Rama Bhosale Prin. and Jt. Director Higher Education, Panvel	Narendra Kadu Jt. Director Higher Education, Pune	Umesh Rajderkar Head Humanities & Social Science YCMOU, Nashik
Salve R. N. Department of Sociology, Shivaji University, Kolhapur	K. M. Bhandarkar Praful Patel College of Education, Gondia	S. R. Pandya Head Education Dept. Mumbai University, Mumbai
Govind P. Shinde Bharati Vidyapeeth School of Distance Education Center, Navi Mumbai	Sonal Singh Vikram University, Ujjain	Alka Darshan Shrivastava Shaskiya Snatkottar Mahavidyalaya, Dhar
Chakane Sanjay Dnyaneshwar Arts, Science & Commerce College, Indapur, Pune	G. P. Patankar S. D. M. Degree College, Honavar, Karnataka	Rahul Shriram Sudke Devi Ahilya Vishwavidyalaya, Indore
Awadhesh Kumar Shirotriya Secretary, Play India Play (Trust),Meerut	Maj. S. Bakhtiar Choudhary Director,Hyderabad AP India.	S.KANNAN Ph.D , Annamalai University,TN
	S.Parvathi Devi Ph.D.-University of Allahabad	Satish Kumar Kalhotra
	Sonal Singh	

**Address:-Ashok Yakkaldevi 258/34, Raviwar Peth, Solapur - 413 005 Maharashtra, India**  
**Cell : 9595 359 435, Ph No: 02172372010 Email: ayisrj@yahoo.in Website: www.isrj.net**



## An Areal Variation Of Fluvial Hazard Perceptions Of Various Social Groups- A Perspective From Rural West Bengal, India

Aznarul Islam , Nilkamal Laskar , Prasenjit Ghosh

Dept. of Geography, The University of Burdwan, Bardhaman , West Bengal,  
Kalyani University, Nadia, West Bengal,  
Dept. of Women's Studies, The University of Burdwan, Bardhaman , West Bengal

### Abstract:

*Rukunpur and Udhamdanga villages of Nadia district, West Bengal, India are lying within the lower reach of the River Bhagirathi which are conspicuous by the presence of flood and river bank erosion-the two most important fluvial hazards in the Gangetic Delta. In this paper, it has been intended to show the extent of river bank oscillation and flooding upon the socio-psychic components of the inhabitants of the villages. The field study shows that those who have landed property mainly agricultural lands are more threatened by the bank erosion than by the floods but the situation is reverse in case of the landless labour.*

### KEYWORDS:

Bank erosion; Flood; Bhagirathi River; Hazard perception; Rukunpur and Udhamdanga villages

### INTRODUCTION :

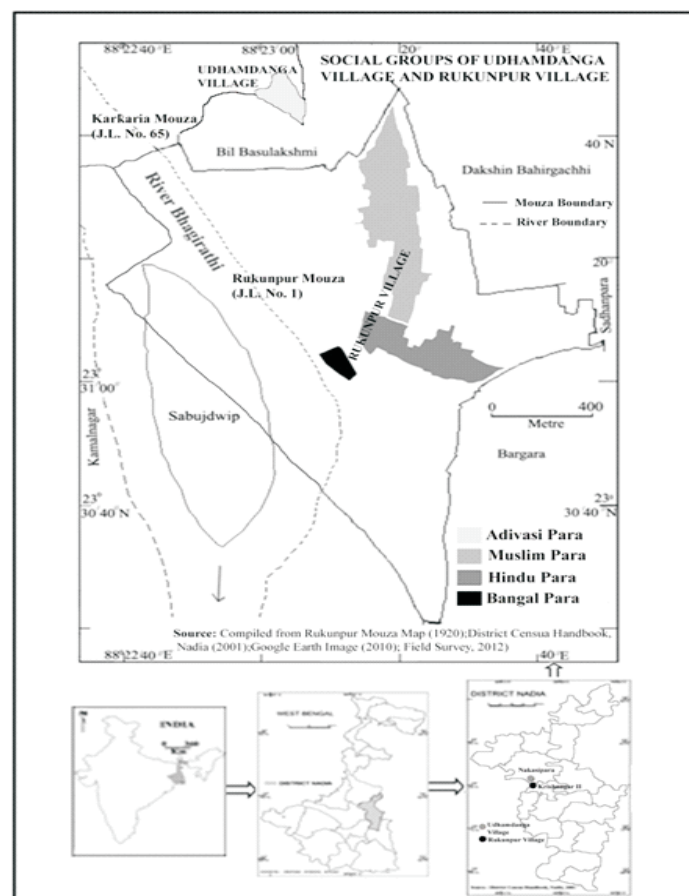
Flood and Bank erosion are the two common forms of geomorphic hazard associated with floodplain and meandering or braided river systems (Lawler, 2004; Bandyopadhyay, 2007). These two hazards erode the thousands of lives across the world every year. That's why there are extensive works about flood and bank erosion existing both in the physical sciences and social sciences. The some of the notable works about the river bank erosion in the physical context are carried out by Leopold and Maddock, 1953; Coleman, 1969; Thorne, 1981, 1991; Bandyopadhyay, 2007; Parua, 2009; Sharma et al., 2010 and similarly in the social context by Keya and Harun, 2007; Jimoh, 2008; Iqbal, 2010; Rudra, 2011. The some of the notable works about the river flood in the physical context are carried out by Snipes, et. al. 1974; Baker, 1988; Gupta, 1988; O'Connor, et. al. 2002; Mukhopadhyay, 2010; Mandych, 2012; and similarly in the social context by Vlachos, 1995; Rudra, 2011; Cançado et. al. (2012).

These extensive works prove the severity of both the fluvial hazards especially in the flood plain and delta region. In India Ganga-Brahmputra delta is no exception to this. Rukunpur and Udhamdanga villages of Nadia District, West Bengal are lying within lower reach of the River Bhagirathi which are flood and bank erosion prone and hence erode the land and lives of the people therein constantly

### STUDY AREA

With the above backdrop, the Rukunpur Villlage located in Rukunpur Mouza bearing the J.L.No. 1 located in C.D. Block Krishnagar II, Nadia District, West Bengal and Udhamdanga Village located in Karkaria Mouza bearing J.L.No. 65, C.D. Block Nakasipara, Nadia District, West Bengal (Fig. 1) have been selected because of the following reasons:

Please cite this Article as : Aznarul Islam , Nilkamal Laskar , Prasenjit Ghosh, An Areal Variation Of Fluvial Hazard Perceptions Of Various Social Groups- A Perspective From Rural West Bengal, India : Indian Streams Research Journal (Oct. ; 2012)



- From the stand point of physical geography, both the areas are prone to fluvial hazards notably simultaneous bank erosion and flood in case of Rukunpur and only flood in case of Udhamdanga.
- From the stand point of social geography the areas have various social groups viz. Muslim Para, Hindu Para, Bangal Para in Rukunpur Village and Adivasi Para in Udhamdanga having various degree of marginalization.
- An ideal area for correlating the fluvial hazards to perceptions of the people that area,

## OBJECTIVES

The major objectives of the research work are as follows:

- To identify nature and extent of the flood and bank erosion around Rukunpur and Udhamdanga villages
- To find out existing pattern of the hazard perceptions of various social groups in respect of flood and bank erosion.
- To find out causes of variability of hazard perceptions among the various groups
- To find out whether there is any relation between landed property and hazard perception

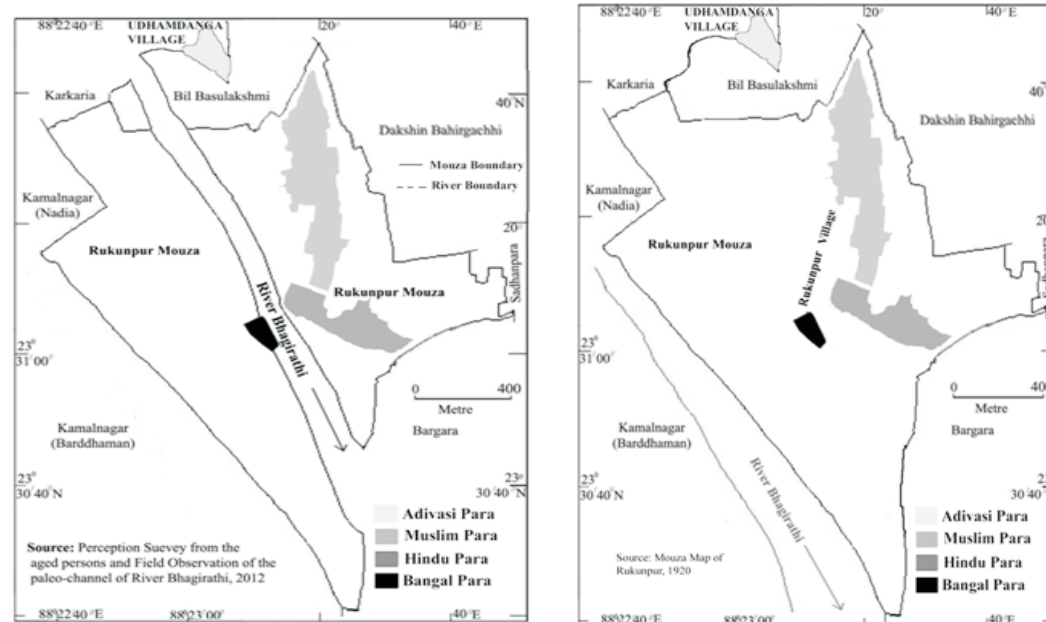
## MATERIALS AND METHODS

Data for carrying out the research have been collected from field survey taking 20% sample household on a stratified random basis from, Adivasi Para, Muslim Para, and Hindu Para and 100% households from the Bangal Para because there were only 13 households during the survey. Out of 120 Adivasi households 24 households, of 842 Muslim Para households 168 households and of 188 Hindu Para households, 38 sample households, i.e. total 243 households out of 1163 have been taken for the present research work. Both the quantitative and qualitative data gathered have been processed using various software like M.S. Excel 2007, M.S. Word 2007, MapInfo 7, and Adobe Photoshop 7 to reach the goals of

the paper.

## RESULTS AND DISCUSSIONS

Nature of River Bank Instability and Flood River bank in lower reach of the River Bhagirathi is very unstable (Islam, 2011). Rukunpur Mouza is located within the lower reach. Hence, this Mouza's southern portion, adjacent to the river, is very unstable triggered by the instability of the Bhagirathi's left bank. It is to be noticed that Bhagirathi's banks in this segment is always oscillating within a limit as far as the past study supports. Generally, there is near about 200-240 years cycle of fluvial swing (Islam, 2012). It is clear that the River Bhagirathi has moved towards south-western portion in 1920s from the middle of the Mouza probably in 1800 (Fig. 2. & 3). Again the river is trying to take the former paleo channel of the River Bhagirathi through which the river flowed down probably in 1800 (Fig.4). During 1920 and 2012 the total area eroded by the river Bhagirathi is 0.7906 Sq. Km. from this Mouza, whereas the total area of this Mouza is 2.7357 Sq. Km. In other words, during the span of nearly 100 years 28.9% of the total area has been lost (Islam, 2012). It is seen that people residing Udhamdanga are Santhal tribe having no landed property except settlement land. All areas except the Adivasi Para have lost land to some extent by the river bank erosion. In respect of flood it can be said that it occurs in four all the localities (Paras).Bangal Para experienced flood every year followed by Muslim Para and Adivasi Para. And Hindu Para and



south-eastern tip of Muslim Para are less flood prone (Fig. 5).

Fig. 2 River Bhagirathi and Rukunpur and Udhamdanga Villages, 1800 A.D. (Probably )

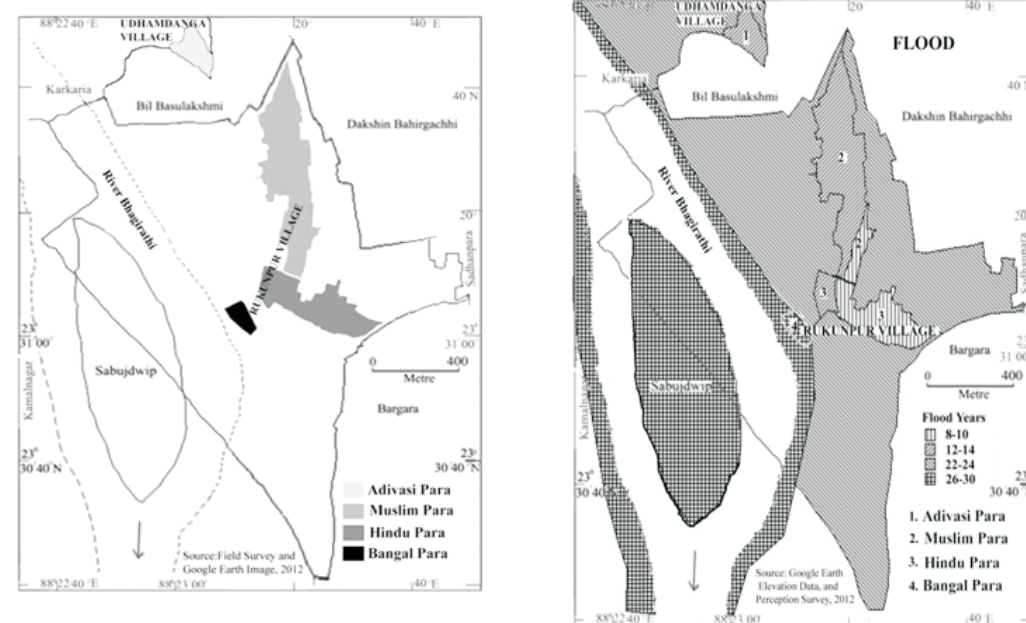


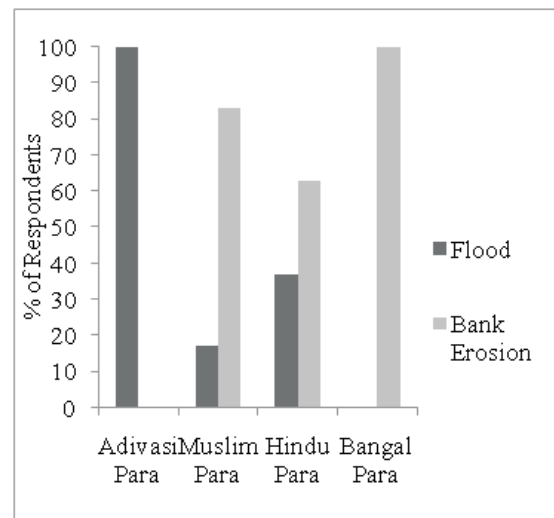
Fig. 4 River Bhagirathi and Rukunpur and Udhamdanga Villages, 2012

Fig. 3 River Bhagirathi and Rukunpur and Udhamdanga Villages, 1920 A.D.

Fig. 5 Occurrences of floods in the last 30 years, in Rukunpur and Udhamdanga Villages and surroundings

#### PATTERN OF FLUVIAL HAZARD PERCEPTIONS

Field survey establishes that river bank erosion is more harmful than flood in Muslim Para Hindu Para and Bangal Para and in Adivasi Para flood is more harmful than bank erosion (Fig. 6). The respondents from the Muslim Para, Hindu Para and Bangal Para argue that as bank erosion triggers a permanent loss of land, it is the more harmful phenomenon than flood. In case of Adivasi Para, in spite of having relatively less flood probability in comparison to the Bangal Para, they opine that flood is more harmful because they have no landed property except settled area.





### CAUSES OF AREAL VARIATION OF HAZARD PERCEPTIONS

Adivasi Para perceives flood as more harmful than bank erosion while the other three social groups think the reverse. To establish this areal variation of hazard perception eleven variables relating to socio-economic structure have been adopted. These are 1) selling or loss of household properties, 2) selling or loss of livestock, 3) quantitative loss of land, 4) qualitative loss of land, 5) fall in income, 6) occupational shifting, 7) unemployment, 8) indebtedness, 9) homelessness, 10) migration, 11) social cohesion. When disaster strikes, the poor usually survive by selling of land, livestock, housing material and personal belongings. bi-cycle, motor cycle, tractor, women jewellery ( Hutton and Haque, 2004)

Fig. 6. Perception about the more harmful fluvial hazards among the various social groups of Rukunpur and Udhamdanga Villages (source: Field Work, 2012)

In respect of selling or loss of household properties, it can be said that people of the Adivasi Para are heavily victimized by flood than by bank erosion. This situation is exactly reverse in case of Bangal Para and the Muslim Para is more victimized by the bank erosion than by the flood as the perception survey reveals (Fig.7). In Hindu Para nearly 60% respondents favour the flood hazard as more harmful. In regards of livestock selling or loss, it is observed that during big flood year 2000, 1999 hundreds of cattle, buffaloes, goats, chickens were washed away in flood current. In little flood years, pastures are flooded and consequently fodder for the cattles becomes unavailable. Hence they are bound to sell the cattles. Not only flood but the bank erosion by the river Bhagirathi takes away pasture land used for grazing and hence directly affect the animal rearing. Along with this, it is also found that indirectly bank erosion induces the selling of animals for their very poor economy. The perception of the various social groups indicate that except Bangal Para, all the other three groups agree that flood is impacting more badly than bank erosion. In respect of quantitative loss of land, bank erosion is the real factor. That is why except Adivasi Para, the other three groups are opined to be more adversely affected by the bank erosion. In Adivasi Para there is no bank erosion at all. That is why if quantitative land loss occurs, generally does not, it's by flood of high magnitude

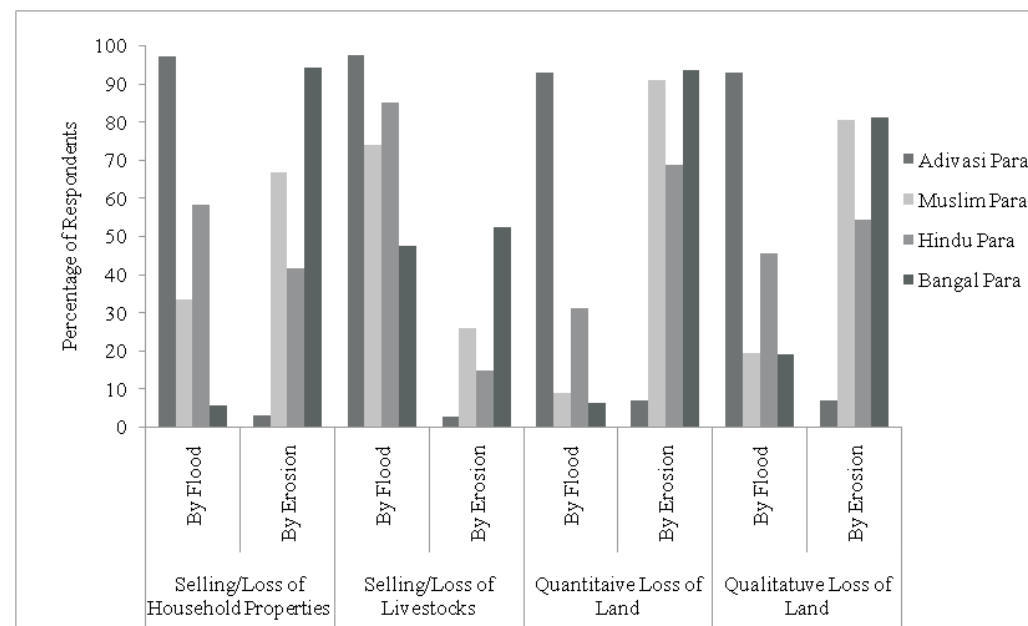


Fig. 7. Nature of relative loss of various properties by flood and bank erosion- a perceptual study among the various social groups of Rukunpur and Udhamdanga Villages (Source: Field Work, 2012)

In respect of qualitative loss of land, it is observed that sandy nature of char land formation, creation of marshy land by frequent flooding, and the use of land in excess of its carrying capacity, use of excessive chemical fertilizer, pesticides make the land quality loss. Except Adivasi Para, all other groups opine that bank erosion induces land quality loss as to meet the excess demand of ever increasing population by excessive use of land, fertilizer, pesticide, HYV. Adivasi Para People have no agricultural land but their land quality around settlement may deplete by impounding of flood water. Homelessness is common phenomenon in case of all social groups triggered either by flood or by bank erosion or by the both. Except Bangal Para where permanent loss of habitat has occurred by bank erosion, the majority of the

respondents from the other three social groups opine that flood triggers homeless conditions in most years in monsoon period (Fig. 8). Bangal Para is the most floods prone (Fig.8).

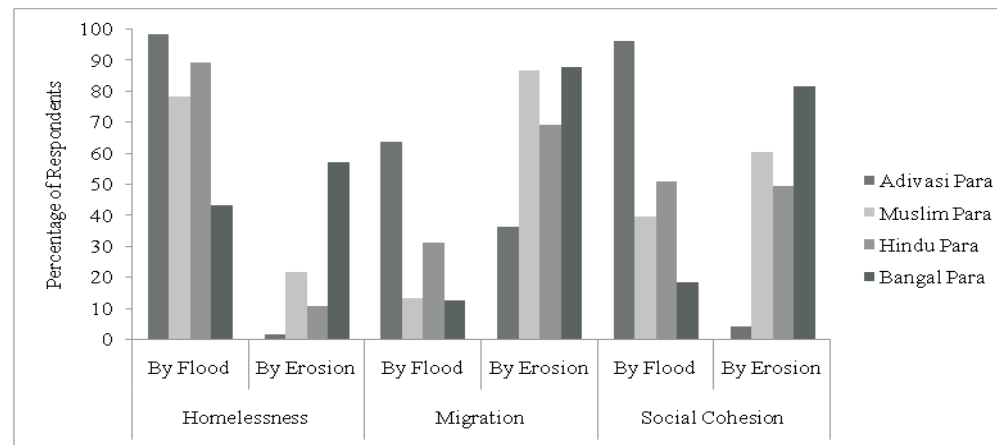


Fig. 8. Nature of relative social instabilities by flood and bank erosion- a perceptual study among the various social groups of Rukunpur and Udhamdanga Villages (Source: Field Work, 2012) Despite this, to them flood is comparatively less disastrous than bank erosion because flood makes temporary homeless but bank erosion make them environmental refugee (Islam & Rashid, 2011). Regarding migration it is seen that in the study area, both economic migration and survival migration are found (Islam, 2012). For sustaining the economy people have moved outside the local area notably Kerala for work. It is especially visible in Muslim Para. In Hindu Para, some people, after getting jobs outside, they have migrated with family. In Bangal Para, for physical survival nearly 70% people have involuntarily migrated to the local region like Muragachha, Dharmada, Nakasiapra. This type of involuntary migration is common by bank erosion in Bangladesh (Haque and Hutton, 2004). It is seen that the social cohesion has increased especially during flood time in the flood camp or among bank erosion victims. The temporal study across the three generations show that income level has fallen at the current generation in all cases but the rate of fall is the maximum in case of Bangal Para followed by Muslim Para, Hindu Para and Adivasi Para. For this rapid fall of income, the bank erosion is more responsible than flood as respondents from the three Paras except Adivasi Para suggests (Fig. 9). In case of occupational shifting, it is seen that except Adivasi Para, the other three groups have shown the radical change in the occupational pattern. The big (>40 bigha land) and medium farmers (20-40 bigha) have been turned into landless. The successive generations are forced to be labour in different sectors. That is the occupational diversification has emerged (Islam, 2012) in the Muslim Para, Hindu Para, and Bangal Para. But in case of Adivasi Para, it is seen that their occupational shifting is very little because they principally remained day labour, workers in bidi binding for the generations as they don't have landed property to cultivate. In respect of unemployment, it is observed that bank erosion adversely impacted the employment generation. Agricultural land acted as the source of income for the cultivators, agricultural labour, and landless labour. Loss of agricultural land by bank erosion has triggered labour surplus and unemployment

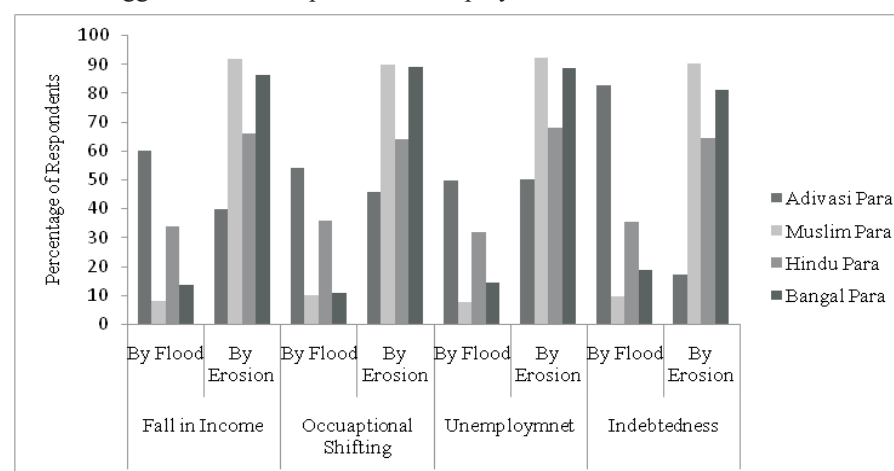




Fig. 9. Nature of relative economic instabilities by flood and bank erosion- a perceptual study among the various social groups of Rukunpur and Udhamdanga Villages (source: Field Work, 2012) So in this variable, all groups even Adivasi Para, lest impacted by bank erosion, also agree that bank erosion has taken away their jobs. In respect of indebtedness (Uddin & Rahman, 2011), it is noticed that more than 40% people of the Bangal Para and Muslim Para are indebted. They took loans from banks or Mahajan, or Co-operative for their cultivation or their daughters' marriage. In the Adivasi Para frequent flooding induces indebtedness (Fig.9). Finally a composite score has been calculated by simple average of all the taken eleven variables (Fig. 10). The value of the score indicates that in spite of the presence of both flood and bank erosion in the same area, bank erosion is impacting more adversely than flood on the various socio-economic parameters save for the Avivasi Para. Hence except the Adivasi Para, as per their opinions concerned, bank protection works immediately needed than that of the flood (Fig. 11) because it is more vicious and eroding the normal lives of people.

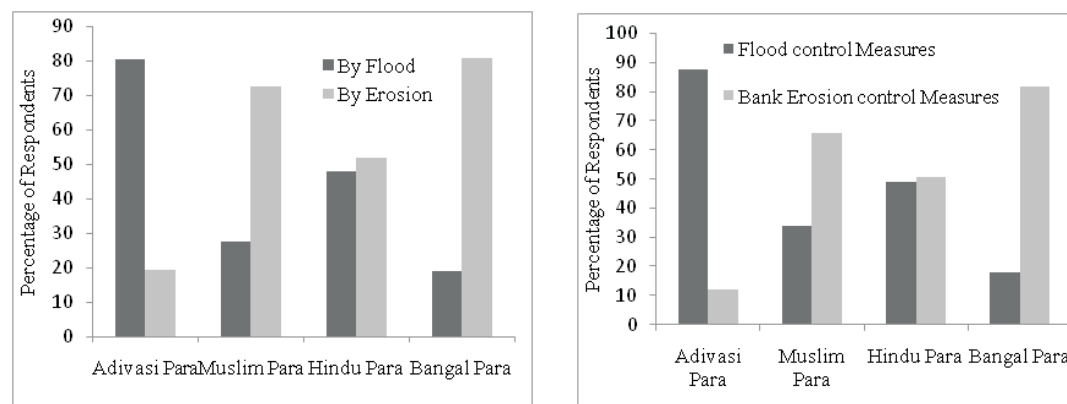


Fig. 10 Composite Score of fluvial hazard perceptions on various socio-economic parameters (Source: Field Work, 2012)

Fig. 11 Perceptions regarding relative urgency for Flood and Bank Control Measures needed (Source: Field Work, 2012)

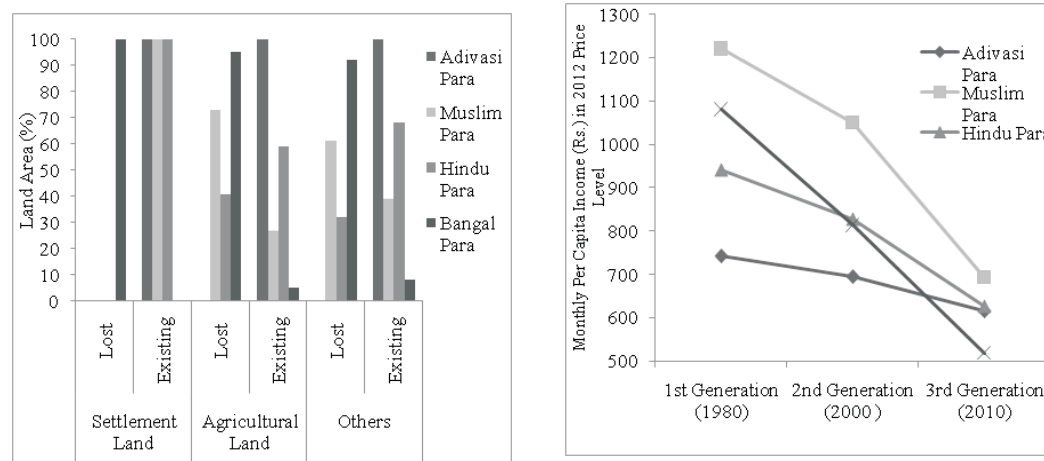


Fig. 12 Nature of land loss (Source: Field Work, 2012)

Fig. 13 Fall of Income (Source: Field Work, 2012)

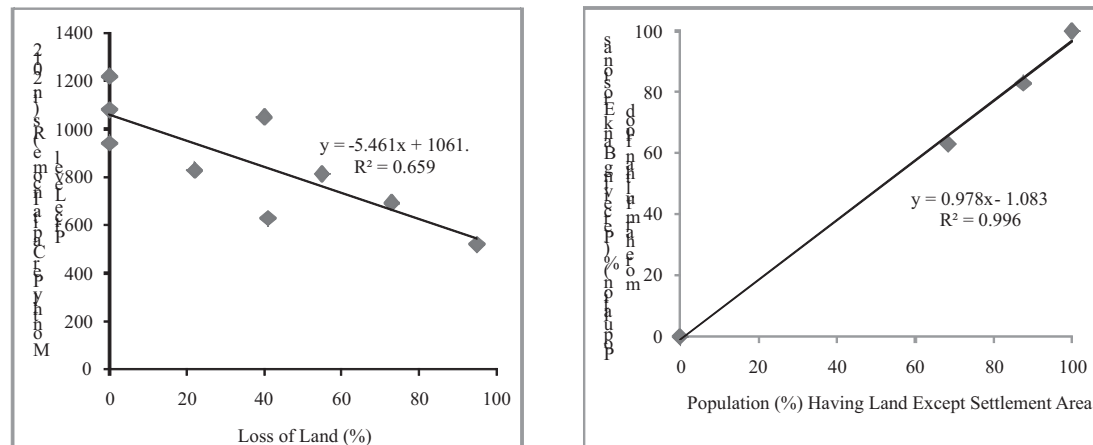


Fig. 14 Correlation between land loss and income loss (Source: Field Work, 2012)

**Fig. 15 Correlation between landed property and hazard perception (Source: Field Work, 2012)****CONCLUSION:**

From the above discussions, it is clear that landed property especially agricultural land has a dominant role in determining the hazard perception. It is seen that except Adivasi Para, all areas have experienced land loss of various kind. In Bangal Para, more than 90% of the settled area, agricultural land, and others land including orchard, bamboo garden have been engulfed by the bank erosion (Fig. 12). This maximum land loss is followed by the Muslim Para and Hindu Para. In accordance with the land loss there is a corresponding fall in the income level (Fig. 13) which is basic to other aspects of society. It is seen that there is a negative correlation between the land loss and the income level (Fig. 14). Hence there is positive correlation between people having land and the people perceiving bank erosion as more harmful than bank erosion (Fig. 15). So it can be said that rural economy is still in the landed property and cultivation agricultural of land. The alternative occupations have not either been acceptable or profitable for their technical and educational lacunae. So, they are yet to adjust to the new landless non-agricultural economy.

**ACKNOWLEDGEMENTS:**

We show gratitude to the respondents of the Runkunpur and Udhamdanga villages for giving their valuable time during survey. We are also thankful to the District Land and Land Reforms Officer, Nadia for providing me the Mouza Map of Rukunpur and Census Office of India, Kolkata for providing census data on Rukunpur Mouza and Karkaria Mouza.

**REFERENCES**

- 1)Bandyopadhyay, S. (2007). Riverbank and Coastal Erosion Hazards: Mechanisms and Mapping in Basu, R. and Bhaduri, S.: Contemporary Issues and Techniques in Geography (pp.36-72), Kolkata: Progressive Publishers.
- 2)Baker, V.R. (1988). Flood Erosion in Baker, V.R. et.al. Flood Geomorphology (pp. 81-95), New York, John Wiley & Sons.
- 3)Cançado, et.al. (2012). Economical Consequences of the Flood: modelling the impacts in an urban space, UNESCO-IHE Publication, pp. 1-3, w2-2\_gen\_pap\_economical\_consequences\_of\_the\_flood.pdf
- 4)Gupta, A. (1988). Large Floods as Geomorphic Events in Humid Tropics in Baker, V.R. et.al. Flood Geomorphology (pp. 301-320), New York, John Wiley & Sons.
- 5)Hutton, D. and Haque, C.E. (2004). Human Vulnerability, Dislocation and Resettlement: Adaption Process of River Bank Erosion-induced Displacees in Bangladesh, Disasters, 28 (1), 45
- 6)Iqbal S. (2010). Flood and Erosion Induced Population Displacements: A Socio-economic Case Study in the Gangetic Riverine Tract at Malda District, West Bengal India. J Hum Ecol, 30(3) 201-211
- 7)Islam, A. (2010-2011). Variability of Stream Discharge and Bank Erosion – A Case Study on the River Bhagirathi. Journal of River Research Institute –River Behaviour and Control, 31, 55-66
- 8)Islam, A. (2012). Unstable River Bank and the Question of Social Stability: A Study on the village Rukunpur, C.D. Krishanagr II, Nadia, West Bengal, an unpublished M.Phil Term paper

- 9)Islam M.F. and Rashid, B. (2011). Riverbank Erosion Dispacees in Bangladesh: Need for Institutional Response and Policy Intervention. Bangladesh Journal of Bioethics, 2(2), 9.
- 10)Jimoh, H.I (2008). Effects of River Erosion on houses: A Case Study of Asa River Catchment in Ilorin, Kwara State, Nigeria. The Social Sciences 3(2), 193-195.
- 11)Keya, M.K. and Harun, S.M.R (2007). Riverbank Erosion Induced Stress and Coping of Displaced Women in Bangladesh. Empowerment, 14, 17-30.
- 12) Leopold, L.B. and Maddock, T.Jr. (1953). The Hydraulic Geometry of stream Channels and Some Physiographic Implications, US Geological Survey, Professional Paper No. 252, pp. 1-52
- 13)Mandych, A.F (2012). Classification of Floods. Water Interaction with Energy, Environment, Food and Agriculture, 2,1-9
- 14)Mukhopadhyay S. (2010). A Geo-Environmental Assessment of Flood Dynamics in Lower Ajoy River Inducing Sand Play Problem in Eastern India. Ethiopian Journal of Environmental Studies and Management, 3(2), 96-110.
- 15)O'Connor, J.E. et. al (2002). The Geology and Geography of Floods Ancient Floods, Modern Hazards: Principles and Applications of Paleoflood Hydrology. Water Science and Application ,5, 359-385
- 16)Parua, P.K. (2009). Farakka Barrage and its Alleged Impact on Floods and Bank Erosion Problems of Malda and Murshidabad Districts of West Bengal in Parua, P.K.: Some Aspects About Farakka barrage Project, Vol. II (pp. 30-44), Berhampore: Shilpanagari Prakasani.
- 17)Rudra, K, (2011): The Encroaching Ganga and Social Conflict: the case of West Bengal, India, unpublished paper, pp. 19-32
- 18)Snipes, R.J. et. al. (1974). Flood of June 1965 in Arkansas River Basin, Colorado, Kansas and New Mexico, United States Govt. Printing Office, Washington, Geological Survey Water Supply Paper ,1850-D ,1-94
- 19)Thorne, C.R. (1981). Field measurements of rate of bank erosion and bank material strength, Proceedings of the Florence Symposium, June 1981 on Erosion and Sediment Transport Measurement, IAHS Publ. No. 133, pp. 503-512
- 20)Thorne, C.R. (1991). Bank Erosion and Meander Migration of the Red and Mississippi Rivers, USA, Proceedings of the Vienna Symposium, August 1991 on Hydrology for the Water Management of Large Rivers Basins, IAHS Publ. No. 201, pp. 301-303
- 21)Uddin, M.N. and Rahman M.M.(2011). Socio-Economic Impact of Erosion along the Right Bank of the Jamuna River in Bangladesh. DUET Journal 1(2), 39.
- 22)Vlachos, E. (1995). Socio-Economic Impacts and Consequences of Extreme Floods.U.S.- Italy Research Workshop on the Hydrometeorology, Impacts, and Management of Extreme Floods (pp. 1-18),Perugia (Italy).

#### GLOSSARY OF LOCAL TERMS

Adivasi: Tribe

Bangal: A group of refugees, who have come in the Rukunpur Mouza from Bangladesh during and after the partition of India in 1947

Charland: River Island, a newly elevated land formed by river deposition

Ghoshes: Milkman community

Mahajan: Persons who lends money at high interest rate

Mouza Map: Cadastral Map, a large scale map (scale 1:3960) for revenue collection for smallest administrative unit of India

Para: Locality inhabited by a specific group of population

Sabujdwip: A River Island

# Publish Research Article International Level Multidisciplinary Research Journal For All Subjects

Dear Sir/Mam,

We invite unpublished research paper.Summary of Research Project,Theses,Books and Books Review of publication,you will be pleased to know that our journals are

## Associated and Indexed,India

- \* International Scientific Journal Consortium    Scientific
- \* OPEN J-GATE

## Associated and Indexed,USA

- \*Google Scholar
- \*EBSCO
- \*DOAJ
- \*Index Copernicus
- \*Publication Index
- \*Academic Journal Database
- \*Contemporary Research Index
- \*Academic Paper Databse
- \*Digital Journals Database
- \*Current Index to Scholarly Journals
- \*Elite Scientific Journal Archive
- \*Directory Of Academic Resources
- \*Scholar Journal Index
- \*Recent Science Index
- \*Scientific Resources Database

Indian Streams Research Journal  
258/34 Raviwar Peth Solapur-413005,Maharashtra  
Contact-9595359435  
E-Mail-ayisrj@yahoo.in/ayisrj2011@gmail.com  
Website : www.isrj.net