

IMPACT OF EROSION OF BANK OF RIVER
GANGA ON SOCIO-ECONOMIC STATUS OF
BELDANGA-I BLOCK in DISTRICT OF
MURSHIDABAD

Abstract:

River bank erosion has emerged to be one of the most dreadful environmental problems in India. The rivers Ganges, Son, Yamuna, the Brahmaputra, Chambal and Mahi, all are tough competitors when it comes to their bank erosion. Malda, Murshidabad, Nadia District of West Bengal, is among the worst preys of erosion of the river Bhagirathi-Hooghly and thousands of inhabitants are either displaced or suffered huge loss in the form of land, cattle and houses and thrown as destitute. This study was conducted with an effort on analysing the impact of erosion on the socio economic lives of the poor villagers, their frequency of displacement, patterns of rehabilitation, their perception about the causes of erosion and the way they continuously try to adapt themselves to this anathema.

Introduction:

River bank erosion, is the wearing away of bank materials of a river. It is a dynamic process affecting the concave side of the bank, while depositing sediments on the opposite side. Almost every Indian river is prone to bank erosion turning more than half of the country's land affected and lives of millions deplorable. The river Bhagirathi-Hooghly, in West Bengal resorts to massive bank erosion at an alarming scale in Malda, Murshidabad, Nadia, Burdwan and Hooghly and contributes to a dominant irreparable loss of farm lands of a very high quality each year. It has been estimated, that about 43% of the total geographical area of the state has been declared as flood prone(source).. Form reports of West Bengal Irrigation Department, it has been seen that the average annual quantum of land, engulfed by the rivers in West Bengal is about 800 hectares. Beldanga-I block in Murshidabad District is similarly hit by this environmental hazard and its associated problems of mass displacement of the poverty stricken rural population with their land, cattle, houses and other assets lost. In West Bengal studies related to erosion and its impact on people, so far conducted, have given little attention to this part of the planet. This paper is an endeavour to highlight their pangs and bring out the ways these poor mass combat the devouring river.

Objective:

This study was conducted mainly for detecting the problems of the affected , to assess the socio economic impacts of river bank erosion and to have an idea about the adaptability and resilience of the inhabitants.

Study Area:

For fulfilling the objectives, where the above mentioned problem and phenomenon are very much chronic and serious, the study area has been selected SUJAPUR, (about 23°56'N 88°15'E) on BELDANGA –I block of MURSHIDABAD district as situated on the north bank of river Ganga.

Methodology:

A systematic methodological principle was followed in this project work. This can be explaining as follows:

Pre-field study: This study area as selected earlier by us with the help of the SUJAPUR-KUMARPUR GRAM PANCHAYAT member.

Field study: Primary data was generated by intensive field survey. The study of observation has been done very carefully through random sampling techniques on 99 families among of 165.

Post-field study: Data & other information made available & generating on the field were compiled using appropriate software & techniques on the computer. The compiled analyzed data were interpreted appropriately to find out the temporal change-.

Profile of the village:

Sujapur is small village located in Beldanga - I Block of Murshidabad district, West Bengal with total 165 families residing. The Sujapur village has population of 676 of which 356 are males while 320 are females as per Population Census2011.(GOI,2011).

In Sujapur village population of children with age 0-6 is 55 which make up 8.14 % of

total population of village. Average Sex Ratio of Sujapur village is 899 which are lower than West Bengal state average of 950. Child Sex Ratio for the Sujapur as per census is 964, higher than West Bengal average of 956. (GOI,2011)

Sujapur village has lower literacy rate compared to West Bengal. In 2011, literacy rate of Sujapur village was 71.01 % compared to 76.26 % of West Bengal. In Sujapur Male literacy stands at 74.70 % while female literacy rate was 66.89 %.(GOI,2011)

Caste Factor

Schedule Caste (SC) constitutes 5.33 % of total population in Sujapur village. The village Sujapur currently doesn't have any Schedule Tribe (ST) population. (GOI,2011)

Work Profile

In Sujapur village out of total population, 252 were engaged in work activities. 94.05 % of workers describe their work as Main Work (Employment or Earning more than 6 Months) while 5.95 % were involved in Marginal activity providing live hood for less than 6 months. Of 252 workers engaged in Main Work, 43 were cultivators (owner or co-owner) while 82 were Agricultural labourers. (www.census2011.co.in)

Particulars	Total	Male	Female
Total No. of Houses	165	-	-
Population	676	356	320
Child (0-6)	55	28	27
Schedule Caste	36	18	18
Schedule Tribe	0	0	0
Literacy	71.01 %	74.70 %	66.89 %
Total Workers	252	212	40
Main Worker	237	0	0
Marginal Worker	15	0	0

Source: <http://www.census2011.co.in/data/village/315586-sujapur-west-bengal.html>

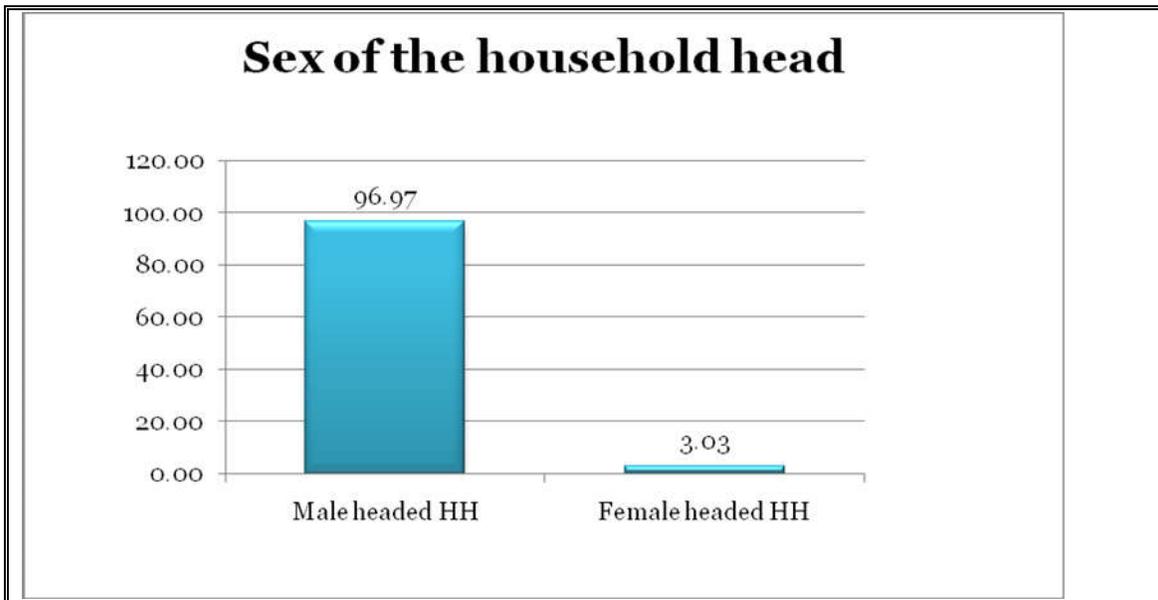
SURVEY REPORT

Demographic profile of household:

Household demography is the study of households. A household usually consists of a number of persons who share a housing unit or part of a it and share food and possibly others essentials for living. Individuals who share a housing unit but do not share food and other essentials for living represent a different household.

In Sujapur village we saw many different types of house hold size. Some of them 2 or 3 in family, whereas some of 10 or 12 in a family. Whatever the family or household size, there we observed the families are mainly male dependent. Almost 96.97% of total families are male headed whereas only 3.03% are female headed.

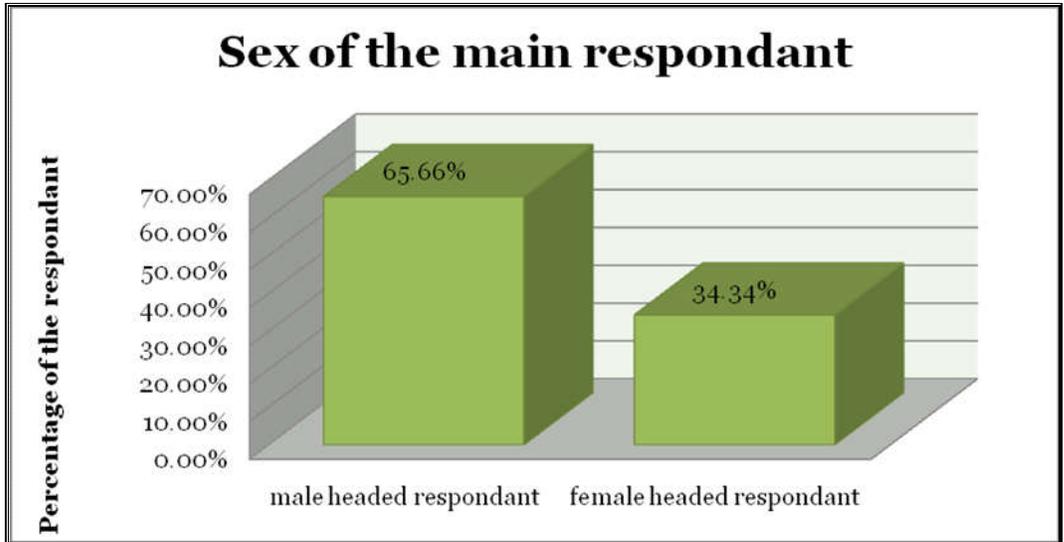
From the field study we get the following figure about male and female headed family.



Source: Author's collection based on primary data collected on March 2015

We saw in there that females are quite comfortable to give us data about their daily life. Besides the male respondents females were also responding to our query. There we saw about 65.66% males & besides this 34.34% females respond to our query.

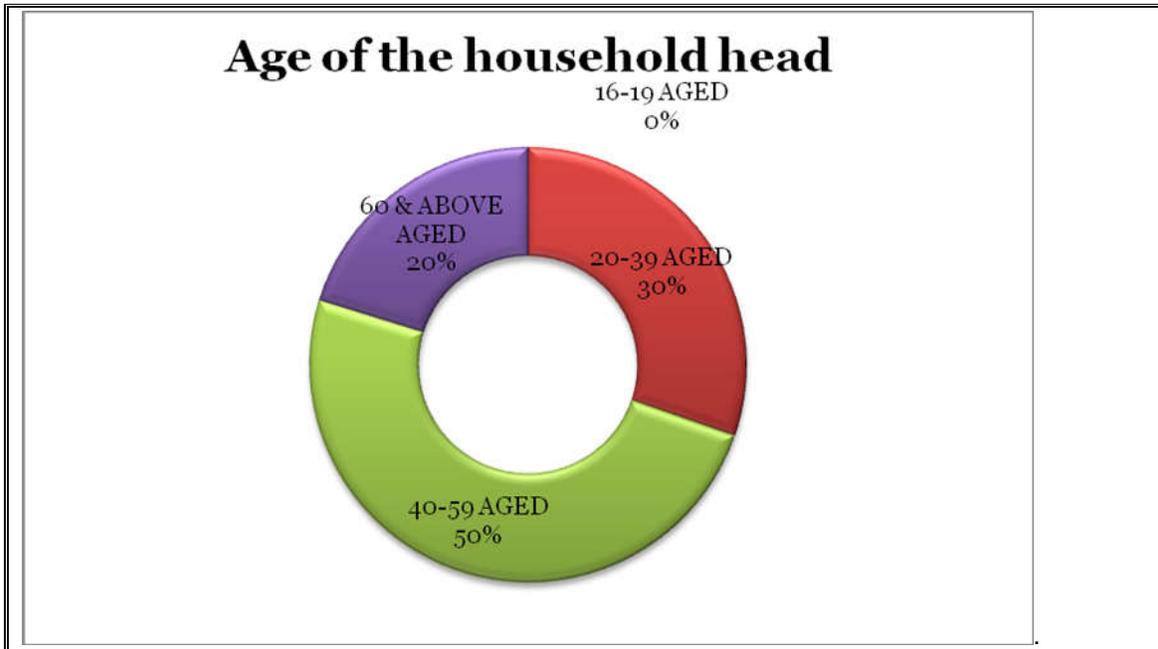
The following column diagram shows the given percentage.



Source: Author's collection based on primary data collected on March 2015

Age Factor:

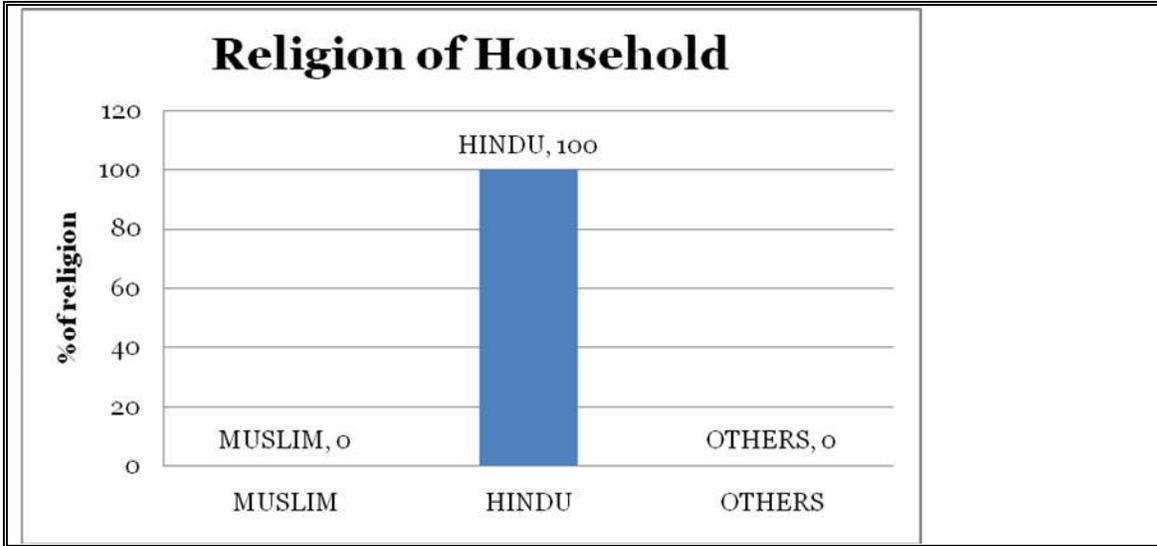
In Sujapur village House Hold head population of age 16-19 is 0 which makes up 0 %, of age 20-39 is 30 which makes up 30.30%, 40-59 is 49,makes up 49.49% and 60 & above is 20 which makes up almost 20.20% of total sample of village. Also the Sex Ratio of Sujapur village is 660 which is lower than West Bengal state average of 950.



Source: Author's collection based on primary data collected on March 2015

Religious Factor:

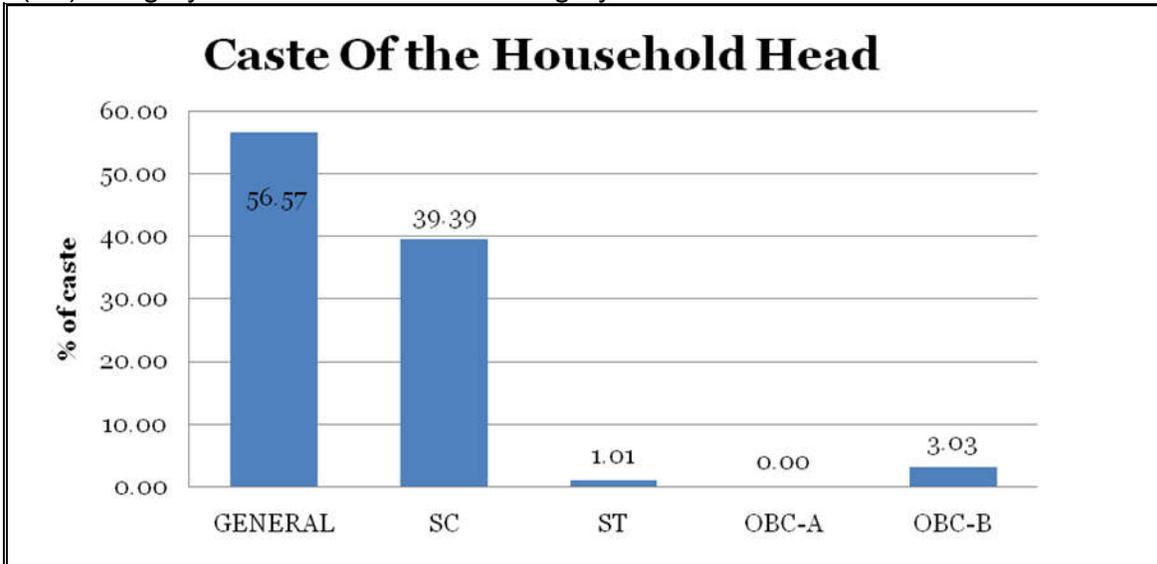
In this village all of the people are Hindu in religion. So obviously their religious views are same. These cover 100% of the total sample and we get the following:



Source: Author's collection based on primary data collected on March 2015

Caste Factor:

General Caste covers 56.57%, Schedule Caste (SC) constitutes 39.39 % of total sample in Sujapur village. The village Sujapur currently has 1.01% of Schedule Tribe (ST) category and 3.03% of OBC-B category

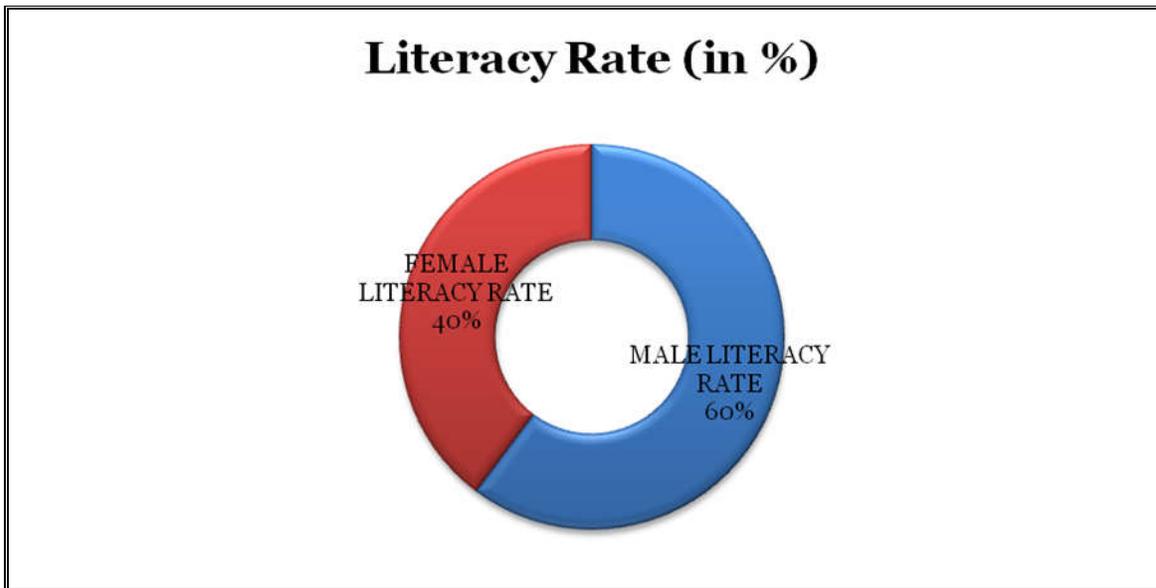


Source: Author's collection based on primary data collected on March 2015

Literacy Factor:

Literacy is the most important things not only for a village's development, but also for a country's economical, social and also political growth."Education For All" this term is missing for the village. Because among the 99 sample as we observed, we saw that males are comparatively more literate than female & this is 60.25% are the male literacy rate & female literacy rate 39.75%.So there, females have to suffer to get literate.

7



Source: Author's collection based on primary data collected on March 2015

Live hood Strategy &Income Factor:

A person's **live hood** refers to their "means of securing the basic necessities -food, water, shelter and clothing- of life". Live hood is defined as a set of activities, involving securing water, food, fodder, medicine, shelter, clothing and the capacity to acquire above necessities working either individually or as a group by using endowments (both human and material) for meeting the requirements of the self and his/her household on a sustainable basis with dignity. The activities are usually carried out repeatedly. For instance, a fisherman's live hood depends on the availability and accessibility of fish. (www.wikipedia.com)

In this village we observed that before erosion almost 32% of the villagers were wage labour in occupation and some of them engaged in crop production and it covers 39% of main live hood strategy. Remaining 29% villagers were occupied in various types of job like trading, horticulture & production, livestock production, fishing etc.

We get the samples about live hood strategies and compiled those we get the following table.

LIVEHOOD STRATEGY BEFORE EROSION	Percentage of People engaged
CROP PRODUCTION	39.39%
TRADING	5.05%
LIVESTOCK PRODUCTION	2.02%
FISHING	12.12%
HORTICULTURE & PRODUCTION	1.01%
ARTISAN	0.00%
WAGE LABOUR	32.32%
OTHERS	2.02%
NOT KNOWN	6.06%

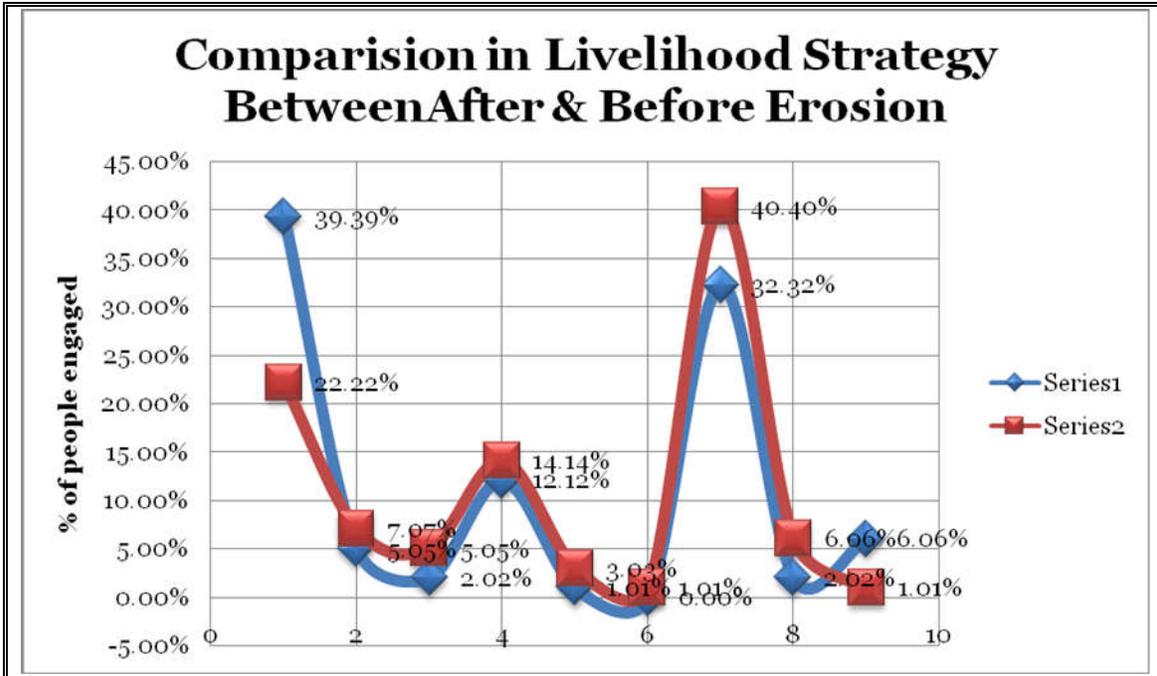
Source: Author's collection based on primary data collected on March 2015

But after erosion about 40% of them became engaged as a wage labour. Some of crop producer divided into other various types of occupation and it reduces to about 22%.

LIVEHOOD STRATEGY AFTER EROSION	Percentage of Peoples engaged to this Job
CROP PRODUCTION	22.22%
TRADING	7.07%
LIVESTOCK PRODUCTION	5.05%
FISHING	14.14%
HORTICULTURE & PRODUCTION	3.03%
ARTISAN	1.01%
WAGE LABOUR	40.40%
OTHERS	6.06%
NOT KNOWN	1.01%

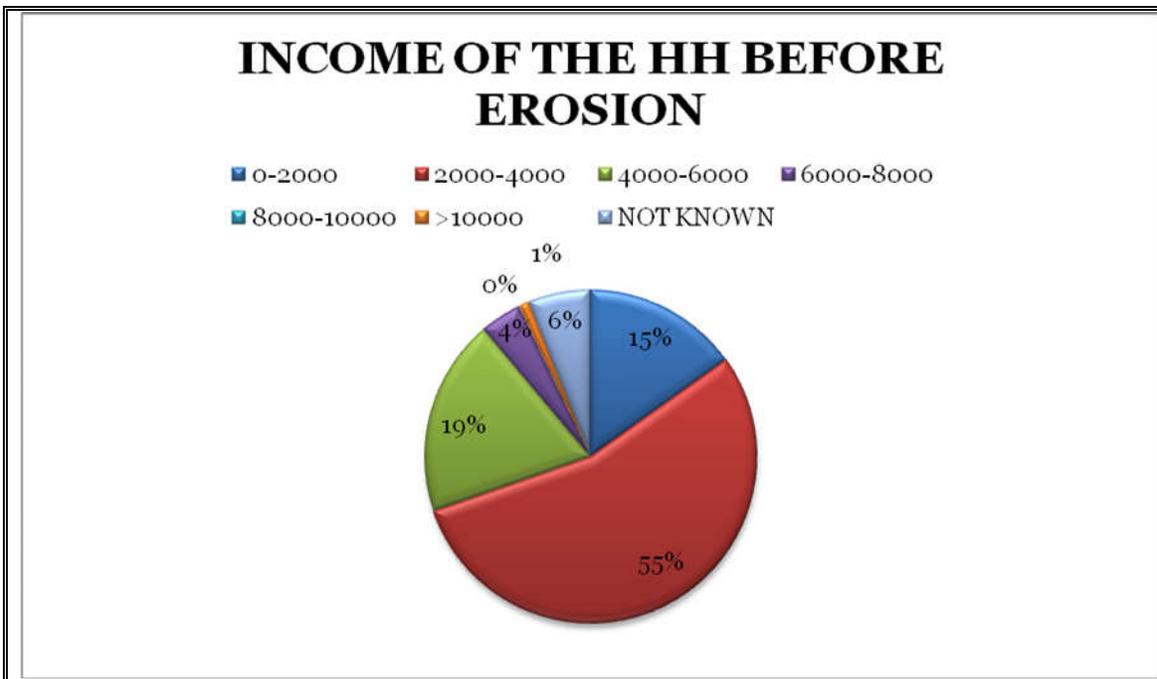
Source: Author's collection based on primary data collected on March 2015

Here we compare between various types of live hood strategy after & before erosion. The following graph shows that comparison



Source: Author's collection based on primary data collected on March 2015

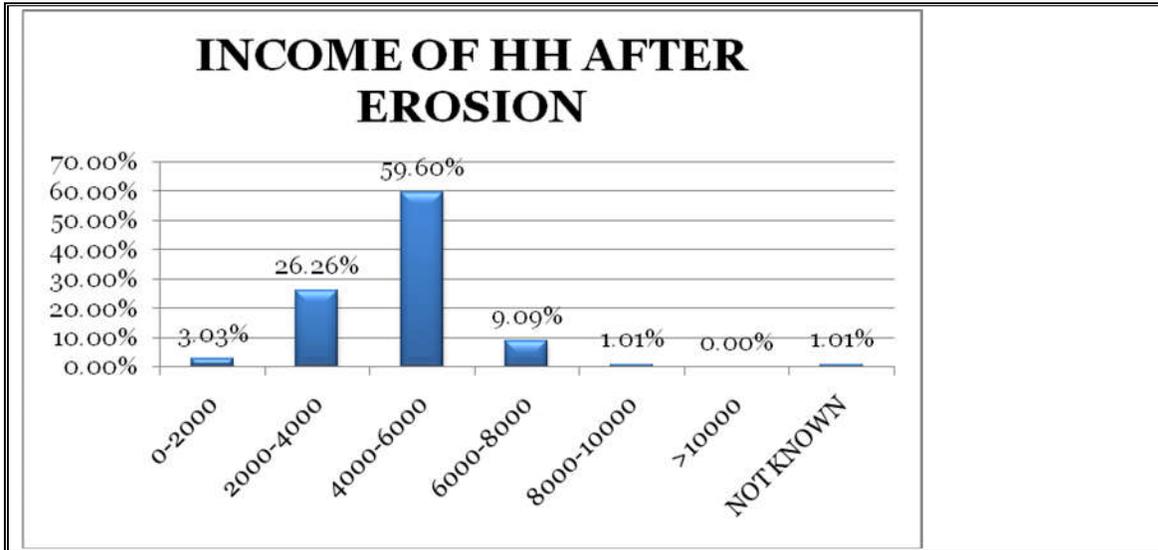
Before erosion 15.15% of the villager's income was between 0-2000 p.m. Also 54.55% of them earned between 2000-4000 p.m. and 19.19% earned 4000-6000 p.m. The following chart represents the data about income before erosion.



Source: Author's collection based on primary data collected on March 2015

As we see after affected in erosion their income level is comparatively high. Many of the villagers earn between 2000-6000 p.m. Among which 26% of them earn between 2000-4000 p.m. and 59% of villager's earnings are between 4000-6000 p.m.

Although 9% of villager's earning is above 6000 p.m. It is given in the following pie diagram.



Source: Author's collection based on primary data collected on March 2015

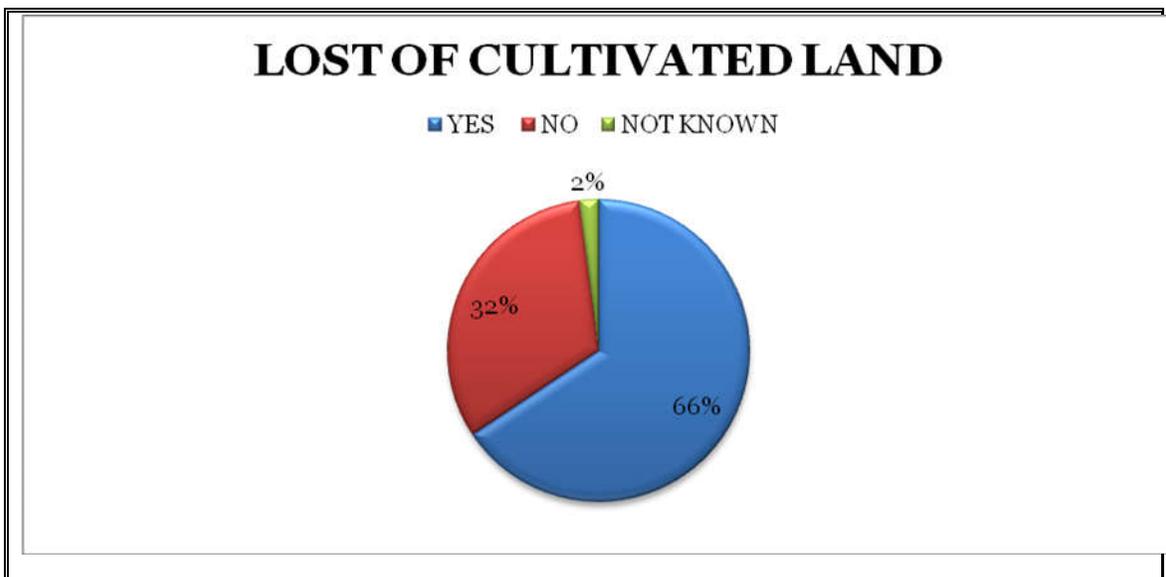
Losses occurred due to riverbank erosion:

Disaster can significantly impede the development procedures. The damage occurs in many ways and the impacts can be as complex as the economy itself. Riverbank erosion has an adverse impact on live hood as homesteads are destroyed, cultivable lands are wiped out and employment opportunities are reduced. In most of the cases, homesteads in riverbank areas are located after the agricultural fields. Wiped out of homesteads implies that the family or individual lost the total assets. Such loss pushes them to displace in such a place where little or no opportunity remains to survive. People of the erosion prone areas have to take different initiatives to cope up with the devastation of riverbank erosion. An attempt has been made to understand the losses occurred due to riverbank erosion in the study area. In view of this, losses were accounted through the loss of agricultural land and production, loss of homesteads, loss of cattle etc. As riverbank erosion is largely related with land, it is very essential to determine the value of land first. Price of land varies from area to area and region to region in Bangladesh with respect to fertility of soil. Moreover, valuation also differs with distance from roads or rivers. The more distance from the major road network the less the price, the more distance from the river the higher the price of land and vice versa.

Loss of Agricultural Land:

Agricultural land is the vital resource for the people living in West Bengal specially those who live in rural areas and bank line. The poor had less amount of land to support their family. In study areas, most of the respondents are heavily dependent on agricultural land in terms of both primary and secondary occupation. A very little loss in cultivable lands put the marginalized people in more vulnerable situation.

We get from the study that most of the people i.e 65.66% respondents in Sujapur lost of their agricultural land due to continual bank erosion. Total economic losses arise from such loss may be counted as value of land, total agricultural production of that particular land and labour force engaged in that occupation.



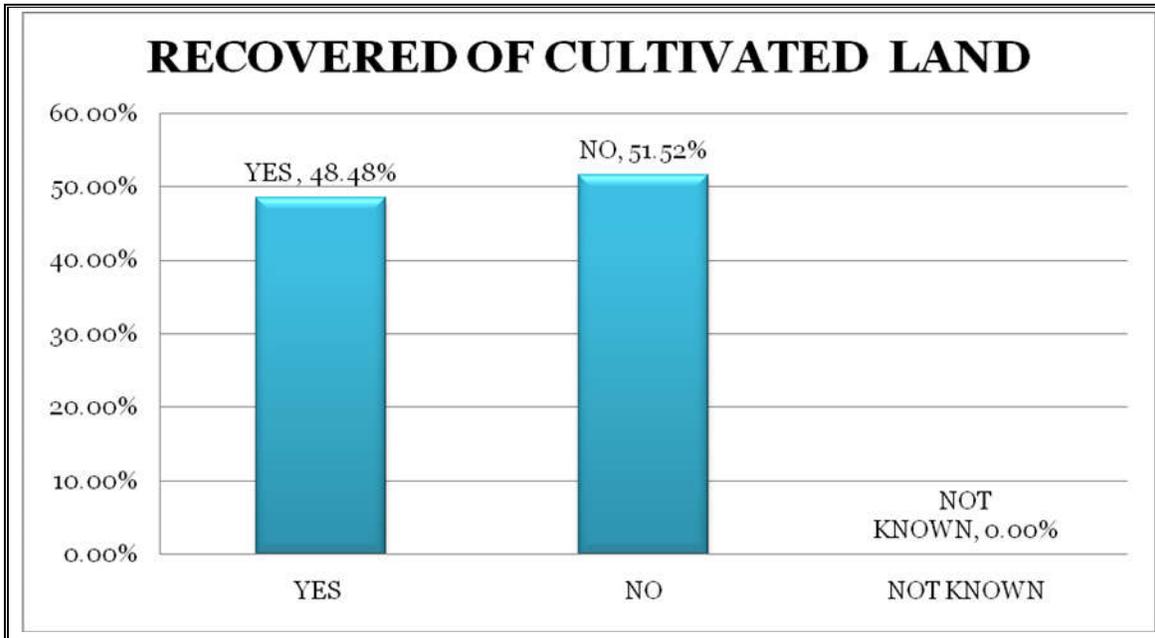
Source: Author's collection based on primary data collected on March 2015

Recover of cultivated land:

To recover from such loss is very unbearable for the poor tenants. To maintain minimum live hood status, they have to recover their land. It was observed that 48.48% respondents of Sujapur cope up with such losses while 51.52% respondents can't recover their land. Such spending shows that peoples of Sujapur are more vulnerable to adjust their live hood option due to riverbank erosion.

Losses occurred from cultivable land is quite expensive which hinders the respondents to bear the spending. In such a condition, they have to rely on relatives, moneylender, neighbourhood etc. It is evident that to cope up with the losses of

cultivable land, majority of them rely on moneylender. It was reported that sometimes moneylenders lent money to relocate household and spent money to buy foods in exchange of their eroded land that eventually makes them landless.



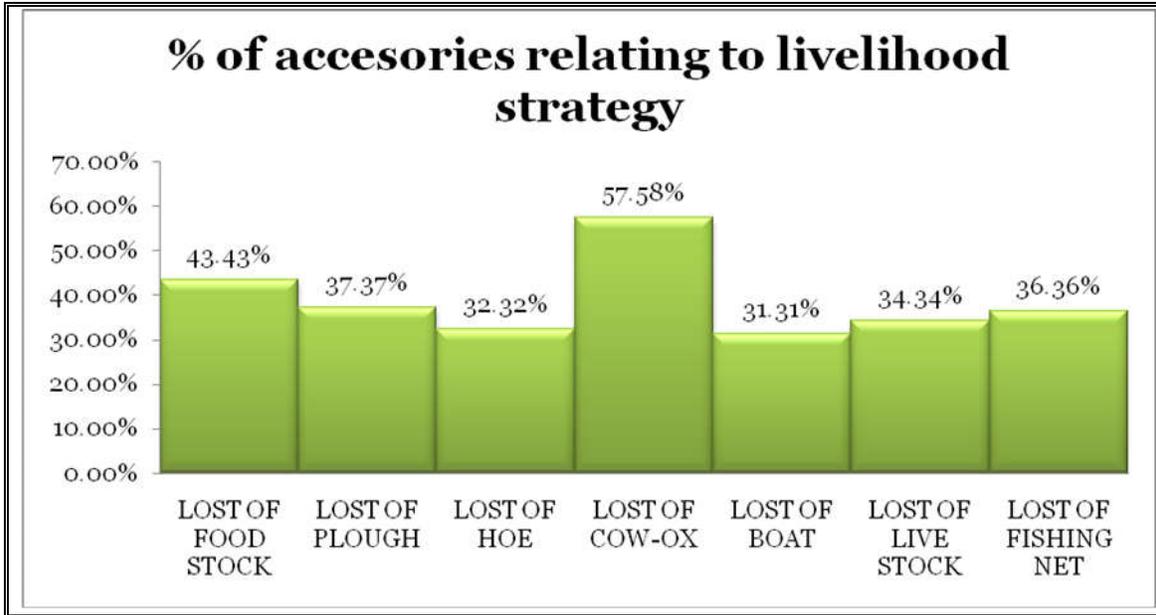
Source: Author's collection based on primary data collected on March 2015

However, marginalized people have nothing to do but borrow money from different sources mostly from moneylender in spite of high rate of interest.

Loss of Accessories relating to live hood strategy:

With the cultivated land, they also loss their live hood dependent accessories due to erosion caused by flood or other factors. Loss of such accessories affects on their agriculture production as well as on their live hood strategies. The following graphical presentation shows how much percentage of them lost the respective agricultural essentials.

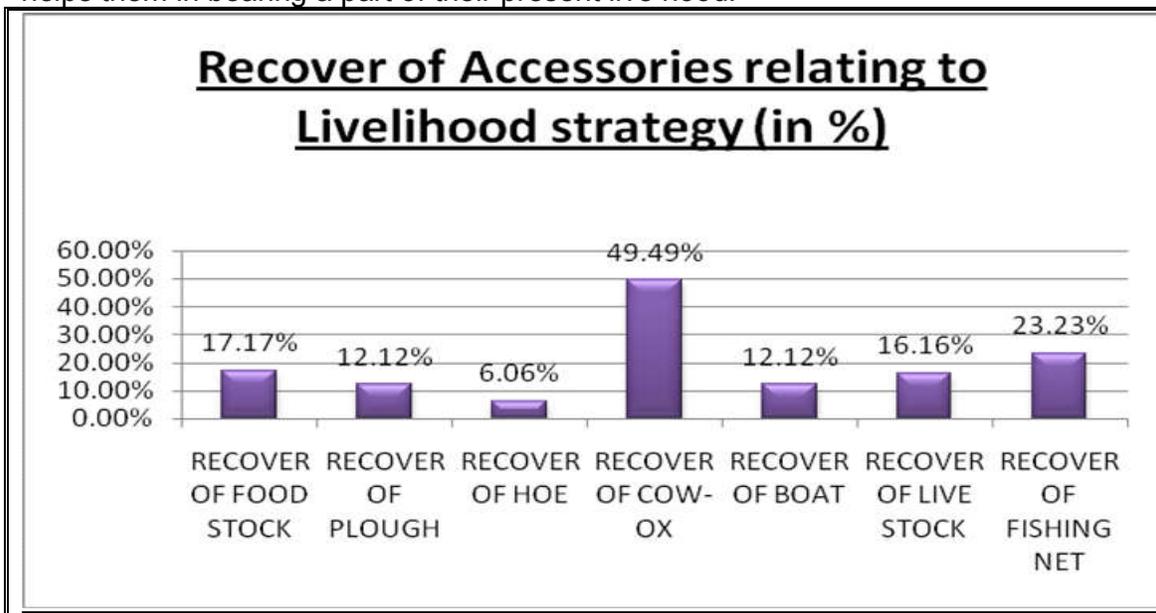
People of those areas are generally poor and such loss makes them ultra-poor. In addition to these, such loss makes hindrance in carrying out normal live hood option.



Source: Author's collection based on primary data collected on March 2015

Recover of Accessories relating to live hood strategy:

Recovery of their food stock with also the agricultural essentials is the most important thing after erosion. The villagers have try to recover these accesories like livestock, their boat & fishing net, plough, hoe. We get from our sample that all of the villagers who lost their things, does not recover all. By researching on our sample data we observe that only 17.17% of villagers recover their agricultural production i.e food stock, 12.12% & 6.06 % villagers recover their agricultural accesories respectively. Now in the village almost half of the villagers have cow or ox which helps them in bearing a part of their present live hood.



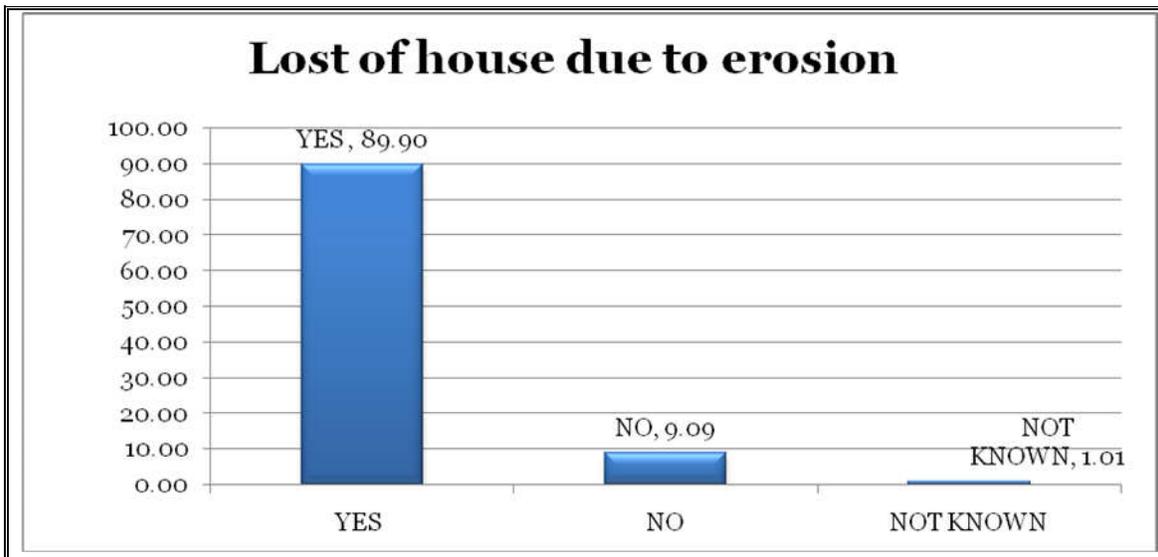
Source: Author's collection based on primary data collected on March 2015

Loss of Settlement/Homestead:

The severe impact of bank erosion is the loss of homestead that makes the population more vulnerable to live a descent life. When erosion strikes, people have no option left behind them except bearing the losses. They never change location of their homestead before the erosion takes place. The main reason behind such behaviour is that they have little earnings that never allow them to replace their homesteads before it totally collapses. In of the study area, it was observed that due to bank erosion most of the respondents most of household area.

Studying on the village we get almost 89.90 percent of house hold lost their house due to erosion. They suffer from this for a long time.

The following chart shows the graphical representation of how many of them lost their settlement.



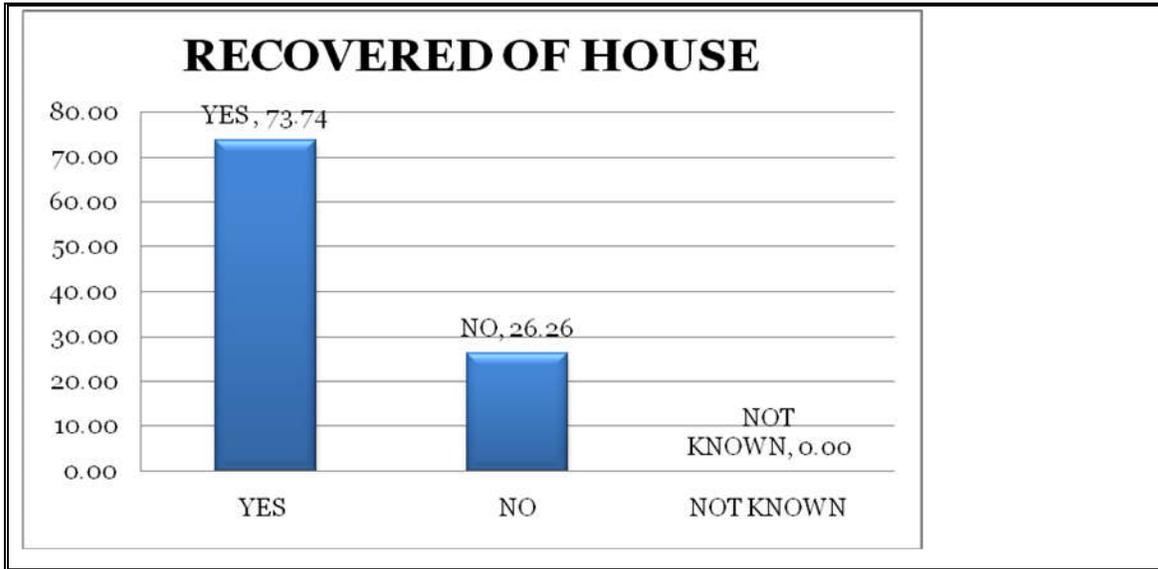
Source: Author's collection based on primary data collected on March 2015

Recover of House:

To resettle their household after the disaster, most of them have to rely on their personal earnings in the study area. However, people in Sujapur have to rely on moneylender. Such difference is an indicative of poor income generating opportunity. Apart from those losses, bank erosion reduced the opportunity of employment, which is one of the most indirect impacts of disaster. When bank erosion took place, those people who are engaged in agricultural and other primary occupation, lost their job. Due to lack of experience and skill, they can neither shift in secondary occupation nor remain involved in primary occupation. In such a situation, they have to migrate temporarily to the nearby

headquarters or large cities to search job opportunity. However, in most cases, they failed to earn a substantive amount of money or they have to get involved in hazardous jobs that have negative health impacts. These situations impede them to fulfil their food security.

The following diagram shows how much family can recover their house.



Source: Author's collection based on primary data collected on March 2015

We have also seen that a certain percentage of people lost their daily essentials like furniture, educational accessories, clothes etc. Some of the sample lost their financial documents also, due to lost of their house on erosion. They can't transport these things when the erosion hit their house.

The required percentage in the table shows item related percentage in the table below,

LOST OF ITEMS	% OF SAMPLES SUFFER
CLOTHES	83.84%
FURNITURE	43.43%
TELEVISION	35.35%
BY CYCLE	39.39%
FINANCIAL DOCUMENTS	10.10%

Source: Author's collection based on primary data collected on March 2015

But now they get recovered from this.

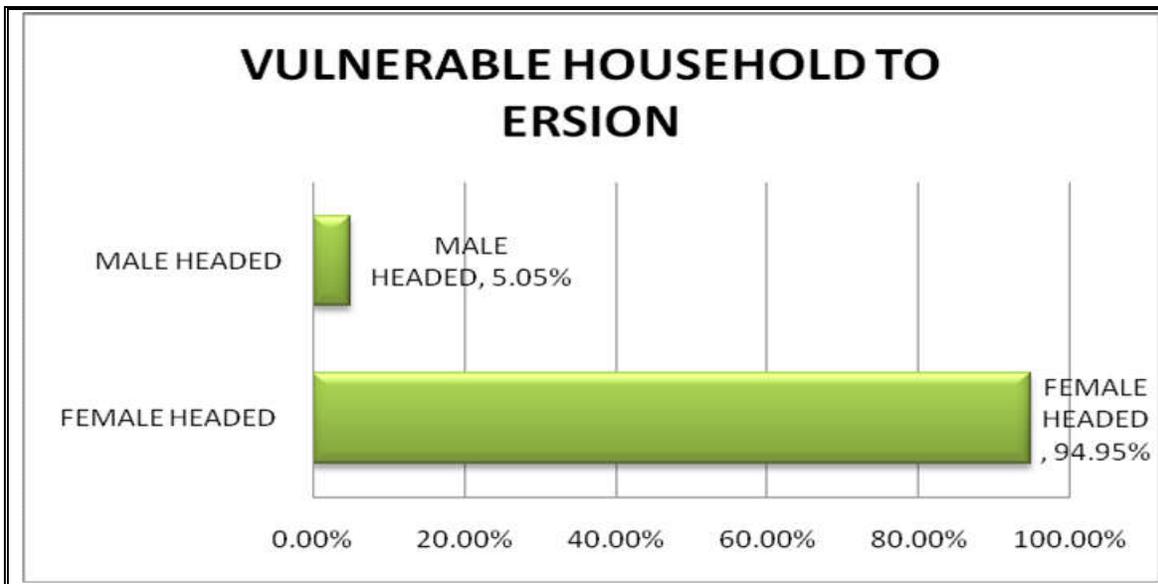
Vulnerable group due to erosion:

Female are the most vulnerable group affected by the erosion. There are a lot of impacts on the women. As we sampling that about 94.95% females are vulnerable due to erosion and the remaining 5.05 % are male vulnerable group.

VULNERABLE HH TO EROSION	PERCENTAGE
FEMALE HEADED	94.95%
MALE HEADED	5.05%

Source: Author's collection based on primary data collected on March 201

The following bar diagram represents the data of the above chart.



Source: Author's collection based on primary data collected on March 2015

Impact on Women:

A. Economic

The economy of the erosion-affected areas in this village is in a shambles as 89.90% of people have lost their home, land and live hood. Whether it is a war, riot or Natural disaster, women have to suffer the most. When the men go to war, the women have to maintain the family. The same is true in this case, too. Losing their live hood, most of the men are forced to migrate in search of work, while the women are left with the responsibility to feed their children. The men who just sit at home without any work, too, pressure the women in various ways. Women have less earning opportunities. As we seen some of them fry puffed rice (muri), make bidis, or do pottery or other work. In Sujapur there are some skilled bricks workers. Many are trying to pick up the skill now under economic compulsions. Some of them go to work in the fields during the sowing season and to dig and carry the soil. In this job,

they are less paid than the male workers. Women from the Bagdi community in Sujapur go for fishing, but faces complain of harassment by security men.

B. Health

i) Toilets

The greatest problem for the displaced women is related to health and sanitation. As they are mostly from the poor family, they can't build up their toilets after erosion. Here, one has to remember that most of these women did have toilets where they used to live before the rivers took away their homes. The severity of the toilet problem cannot be explained unless one sees it. It is affecting their very biological cycle. Learning to remain silent to nature's call during the long hours between daybreak and the dead of night is no easy task. Going to the deserted orchards, fields or canal sides for their daily needs in unearthly hours is causing a security risk to many. Often, they have to run for life or face abuses and even physical assaults from the owners of the orchards or fields. In this scenario, the government-sponsored awareness campaign calling people to have proper sanitation facilities at their homes carry no meaning for them. Although a panchayat staff stressed that toilets had been built for the displaced families, these could be availed only by a small minority having ownership of their residential plots.

ii) Drinking water

As it is, getting safe and clean drinking water is a general problem in the arsenic-prone districts. For the displaced people, the problem is much more acute. In most places, the women have to fetch drinking water with hardship from a distance. Arsenic poisoning has become manifest in the bodies of many. They complain that they do not get "proper behaviour", let alone proper treatment or medicines, at the local health centres for arsenicosis or any other disease. The victims of malnutrition-related ailments are also mostly women and children.

C. Domestic violence

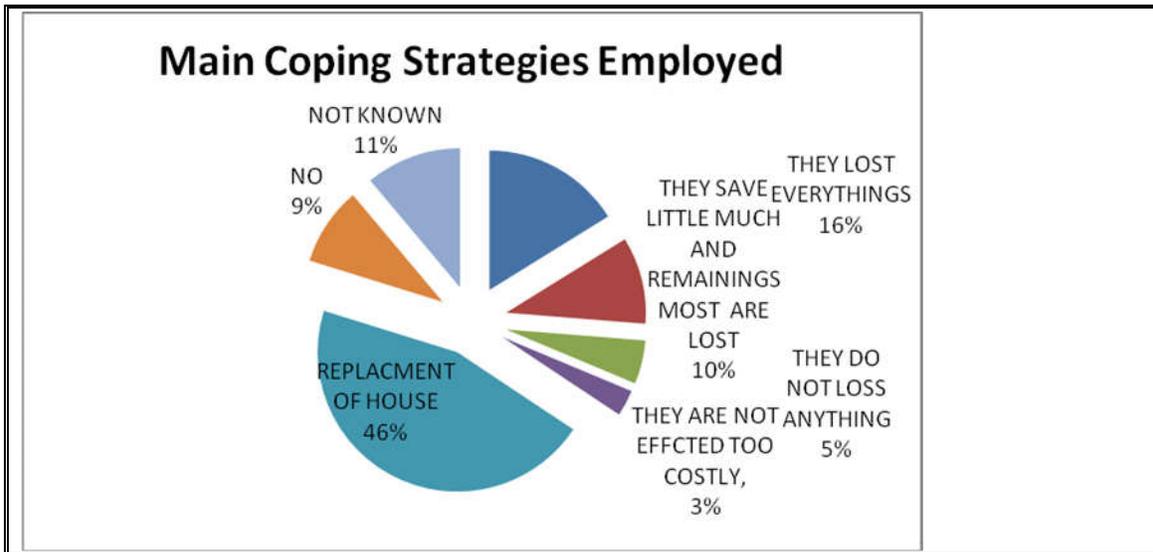
With the loss of income and increasing economic hardships for men, many of them want to lay their hands on the women's meagre income. The demands go on increasing and if not met, is expressed in domestic violence. Many of the women who try to keep their men folk satisfied by giving them a share of their income, too, often find that they waste it on liquor and come back for more. The cycle of domestic violence keeps revolving.

Coping Strategies:

There we have seen, there are a unconsciousness among the suffers. Most of them do nothing but replacement of their house. Some of them lost everything of their as they do not take any effective actions against erosion as well as vulnerability. It was observed that almost 45 person of our over 99 sample replace their house as the main coping strategies. The following chart shows how many of our samples use this as their main coping strategies. Here also represents the graphical form in the following.

MAIN COPING STRATEGIES EMPLOYED DURING EROSION	FREQUENCY
THEY LOST EVERYTHINGS	16
THEY SAVE LITTLE MUCH AND REMAININGS MOST ARE LOST	10
THEY DO NOT LOSS ANYTHING	5
THEY ARE NOT EFFCTED TOO COSTLY,	3
REPLACEMENT OF HOUSE	45
NO	9
NOT KNOWN	11

Source: Author's collection based on primary data collected on March 2015



Source: Author's collection based on primary data collected on March 2015

Government strategies & policies to the vulnerable group:

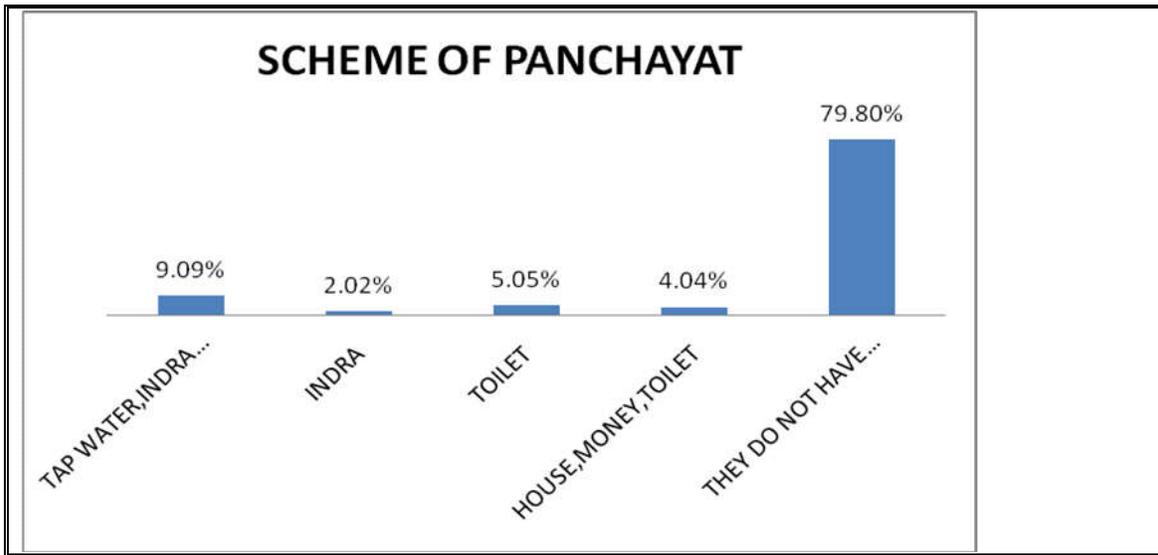
Government response to this problem at local, regional and national levels has been limited to structural measures i.e., embankments, barrages, etc., and very little attention has been paid in developing non-structural and self-help strategies. The govt. gives house, toilets, money and also so many others thing for self-help strategies. But a certain amount of people get this facility. Most of them does not get. They told us that the basic cause for unavailability of such assistance is political inconsistency. The measures show that about 79.80 percent of people do not get any assistance. A small percentage (about 9.09%) has get house under INDIRA ABAS YOJONA scheme. Those, who do not get any assistance, among them 65.66 percent are suffers from political inconsistency and others do not get because of social inequality or they do not know about such type of facility.

As usually the persons who do not get any facility are not satisfied with this.

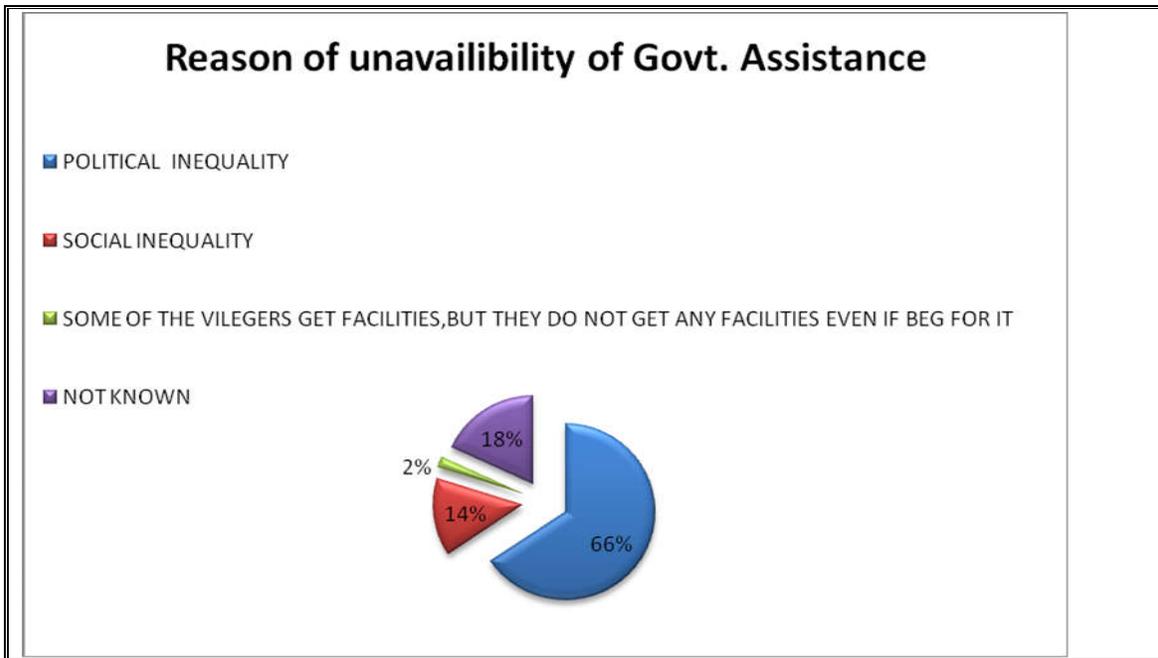
The following chart and diagram shows the corresponding percentage of above data.

SCHEME OF PANCHAYAT	PERCENTAGE
TAP WATER,INDRA ABAS YOJONA etc	9.09%
INDRA	2.02%
TOILET	5.05%
HOUSE,MONEY,TOILET	4.04%
THEY DO NOT HAVE ANY SCHEME OF PANCHAYAT	79.80%

Source: Author's collection based on primary data collected on March 2015



Source: Author's collection based on primary data collected on March 2015



Source: Author's collection based on primary data collected on March 2015

Conclusion:

The marginalized and poor people not only lose property but also experiences socioeconomic deprivation through displacement. Because of the dynamic character of the braided channelled river and the failure of structural measures, the sufferings of the people are assumed to continue. Long-term policies and strategies should be taken to cope up with the bank erosion taking into account the social and institutional adjustment measures. Land relocation assurance is one of the appropriate strategies to cope up with such disaster. In addition, a floodplain zoning is essential to lessen the vulnerability of riverbank erosion. Furthermore, measures should be taken in different level to minimize the loss:

- a) Sustainable embankment construction and its maintenance
- b) Training on disaster preparedness involving local institution/ local government
- c) Massive afforestation with the experience of local knowledge and its maintenance
- d) Action against deforestation
- e) Form an alliance among SAARC countries in order to ensure water distribution within the subcontinent.

Besides these:

1. Special attention must be given towards the rehabilitation of women displaced by erosion. All the displaced people must be rehabilitated in a proper place where the women, as well as men, can have adequate access to the means of decent living and live hood.
2. In the resettlement areas, families that are being financially supported chiefly by women and women who are living alone or with their children must be identified and a special economic and social support system must be developed for them.
3. Self-employment and income-generating schemes must be implemented more extensively for women in these areas.
4. Sanitation and community toilet facilities must be arranged immediately in order to end the health hazards and humiliation that the women have to face every day.
5. Adequate sources of arsenic-free safe drinking water must be provided in every place where the displaced people are living to free the women from the hardship they face in procuring drinking water from distant places.
6. Stress must be laid on the education of girls as well as boys, not only on primary but also on higher levels, honouring the keen interest of the people in this respect even amid hardship.

7. The administration, outreach workers and civil society organisations in the erosion affected localities must be sensitized to the special needs of women. Women's self-help groups

must be extended all support and the banking system in these areas must also be made sensitive to their situation and requirements.

9. Rehabilitation in the long term has to be planned in the context of sustainable antierosion measures. While such measures need to be adopted in consultation with experts and taking all the affected people, including those already displaced, into confidence, care must be taken to ensure that women find their proper place in such schemes. For example, long-term rehabilitation measures should help women overcome the economic imbalance they had to suffer earlier by making them equal owners of the new properties that the displaced families acquire by way of rehabilitation. Similarly, if long-term employment can be provided for the displaced people, the jobs should be distributed equally between women and men.

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