LEVEL OF LIVING OF FLOOD PRONE HOUSEHOLDS: A CASE STUDY IN WEST BENGAL

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ABSTRACT

The study pointed out that the households in the flood prone area represent a mixed lot with differences in resource base and potentials for earning income. There are significant inter-class differences in average and per capita expenditure and income of the households in the flood prone area. More over there is a bulging of households in the lower strata with lower endowments of land. Another noteworthy feature is that it is dominated by households belonging to socially backward and economically under privileged section of the population. In view of these characteristics the vulnerability of the households in the flood prone area seems to be more than elsewhere which calls for dynamic and newer patterns of livelihood diversification.

Key Words: income, expenditure, Engle income function, vulnerability

Introduction

Floods represent a set of complex phenomena such that a universal definition of floods can hardly be found. Floods are observed to occur in different ways and are influenced by a number of factors. The location and magnitude may vary considerably across the place and time. In effect their impact on environment and economy also varies. From a practical point of view any meaningful definition of floods must incorporate the perception on damage and inundation of flood (Sarkar, 2005). One of the most frequently referred definitions of flood relates to river floods is "A Flood is a relatively high flow, which overtaxes the natural channel provided for the runoff (Chow, 1956)." Thus a flood is a relatively high flow over taxing the natural channel provided for the run-off. In an alternative and perhaps more

acceptable version a flood has been defined as any high stream flow which over falls natural and artificial banks of a stream (Rosvelt, 1968).

Flood is undoubtedly the most dreadful natural calamity of Eastern India where it becomes almost an annual phenomenon. The worst affected state of this part of India is West Bengal where 55.43% of total geographical area is flood prone. According to the Government report (2000), the most remarkable flood year, about 2.21 crores of populations were affected and the total estimated loss was Rs. 5,660.65 crores. It is important to note that spatial dimension of the flood affected area is being increased significantly and the damages they render are pervasive and long term. The present study focuses on the lower Ajoy river basin which has been suffering from floods since time immemorial. The evidence of flood in the form of yellowish and whitish sandy silt layer has been traced even in the river astride archaeological sites that dates back to more than two millennium B.C. Ajoy river was navigable for those years and had great commercial significance some thousand years back. Villages along the river were once important trading centres. But these settlements have lost their significance due to the changing of the river regime. During 18^{th} & 19^{th} century normal flood had occurred which resulted the formation of flood plain as there was no embankment in those days. A huge volume of water was flowing through the river of sufficient depth. The river had a tendency to shift its course and as a result a flood plain had extended to a large extent of area. The first cause of floods in this river basin is the vigorous nature of the Indian monsoon. The huge amount of rain that often comes at the end of the monsoon season, mainly in the months of August and September, causes the rivers of the land to overflow. In some years the rainfall is remarkably heavier than the mean rainfall, and floods are a natural consequence of this phenomenon. The second cause is the fact that the carrying capacity of the Bhagirathi-Hooghly River at its point of confluence with Ajoy is far below the volume of water that the latter discharges during peak flow times. The third cause is the effect of dams on Ajoy, especially the major one on Hinglo, which have caused the river bed to become silted and, in years of extreme rainfall, sudden and enormous volumes of water were released from the reservoir(s) that flooded the land on both sides of the river (Mukhopadhyay *et al*., 2005).

In view of the hazards and socio-economic damages related to floods in a pre-dominantly agrarian economy, it seems highly important to initiate institutional intervention in a flood affected area. Given limited spread of non-farm employment opportunities and

financial constraints facing the household's, an effort has been made in this paper to explore the level of living of the households that are compatible in a flood prone area.

Data Base and Methodology

The study has been conducted based on both primary and secondary data. In the first stage in order to collect the primary data, twelve (12) most vulnerable floods prone blocks i.e. 5 blocks from Birbhum and 7 blocks from Bardhaman, spread over 10 police stations of the lower Ajoy basin have been selected purposively. In the second stage following the same criteria, twelve (12) flood prone villages i.e. one village from each block has been selected purposively. In the next stage, the list of households of each village has been collected and 25 households from each village have been selected randomly. Thus, finally 300 households of different categories have been selected as the ultimate sample unit of the study. The collected data has been analyzed for fulfilling the various objectives by employing both tabular and econometric techniques.

Results and Discussion

Level of living of the households is determined by a large number of economic, social, cultural and demographic factors. For example, in a resource poor family the available labour supply or the labour force is considered to be the valuable resource in respect of the earners. Labour force is defined as the magnitude of able bodied potential workers who are capable to generate income by rendering their productive services through employment. In terms of physical definition an individual member of the family constitutes its human resources if he/she belongs to the age group more than 15 to ≤ 59 years. More over the number of children in the family (age below 15 years) represents a significant part of the dependency burden of the households.

Considering the average and per capita annual income, it has been observed that both average and per capita incomes increases with the increase in size of holding (Table- 1). There is significant inter-class gap in income entitlements. Thus average annual income of the large farmers is about four times higher than that of marginal farmers and two times higher than that of small farmers. The per capita income of large farm is more than three times higher than that of marginal farm. If we compare two districts, it has been found that (a) both average and per capita annual incomes are higher in Bardhaman as compared to Birbhum for almost all farming groups and (b) the inter-class differences in income are

prominent in both two districts. The difference seems to be slightly more pronounced in Bardhaman. It follows that it is the lower holding groups which are more constrained in terms of income. Dispersion of income among farmers also implies differences in their abilities to cope-up with crisis conditions especially in the face of flood damages.

Table 1: Income of the sample household by size-class

Size-class	Birbhum		Bardhaman		All	
	Income (Rs.)					
	Average	Per capita	Average	Per capita	Average	Per capita
Marginal	101007.8	23208.06	117006.90	25873.76	109097.20	24581.00
Small	204774.40	47780.68	206246.20	46227.59	205731.00	46757.05
Medium	252034.20	58161.73	312756.90	72976.62	302041.10	70338.35
Large	407744.70	71954.94	413270.20	82654.04	411198.10	78323.45
Overall	138862.50	31790.86	183308.40	40917.05	164789.30	40521.95

Source: Field Survey (2012)

Table 2: Expenditure of the sample household by size-class

Size-class	Birbhum		Bardhaman		All	
	Expenditure (Rs.)					
	Average	Per capita	Average	Per capita	Average	Per capita
Marginal	85545.45	19655.34	98444.44	21769.04	92067.42	20744.30
Small	149428.57	34866.67	152846.15	34258.62	151650.00	34465.91
Medium	163333.33	37692.31	210750.00	49175.00	202382.35	47130.14
Large	261666.67	46176.47	271000.00	54200.00	267500.00	50952.38
Overall	107816.00	24683.15	137508.57	30693.88	125136.67	30771.31

Source: Field Survey (2012)

Table 3: Engel income functions of the flood prone households

Model (1): Y = Annual household expenditure on food
X = Annual household income

Description	Coefficient	Standard Error	T-stat	R^2
Intercept	7176.97	1220.70	5.8794*	0.9430
X-variable	0.4282	0.0060	70.2739*	

*= Significant

Model (2): Y = Annual household expenditure on non-food
X = Annual household income

Description	Coefficient	Standard Error	T-stat	R^2
Intercept	22443.18	860.15	26.09*	0.8065
X-variable	0.1513	0.0042	35.24*	

*= Significant

Table 4: Engel income elasticity

Item	Mean of annual income	Mean of expenditure	Income Elasticity
Food	164789.25	77751.66	0.9076
Non-Food	164789.25	47386.66	0.5263

Note: (1) Income elasticity (Food) – Co-efficient × mean of annual income/mean of expenditure on food
(2) Income elasticity (non-food) – Co-efficient × mean of annual income/mean of expenditure on non-food

Table 5: Annual income-expenditure ratio of the flood prone households by size-class

District	Income-expenditure ratio (%)				
	Marginal	Small	Medium	Large	All
Birbhum	84.69	73.15	64.81	64.17	77.70
Bardhaman	84.14	74.11	67.38	65.57	75.02
Overall	84.39	73.77	67.00	65.05	75.96

Source: Field Survey (2012)

Income entitlements of the respondents pointed out a very low level of overall wealth situation of the families who are surviving in the close proximity of the flood prone area. However as expected the income constraints has also created constraint in expenditure (Table- 2). There is vast difference between the average and per capita expenditure at the household level in Birbhum and Bardhaman districts.

It has been observed that the food items in consumption basket claim the maximum share of the budget of the flood prone households. By analysing the item-wise break-up of expenditure, it has been found that the total spending on food item dominates (62.13 per cent) the entire expenditure. This might be the case of high expenditure elasticity. The expenditure on education appears to be the lowest while for medical treatments is relatively much higher. In case of durables, non-durables assets, the households seem to have a tendency towards building stock in case of market based products. Expenditure on house construction and repairing reflects a relatively higher amount than that of other heads. This reflects the extra burden on account of flood related damages. It is seen that quite a sizeable amount is spent on ceremonies which is generally considered as unproductive.

The above findings do not confirm the Engel's Law according to which an increasing proportion of income is spent on non-food items with the increase in household income. The results hardly pointed out that any perceptible shift from food to non-food items and/or high quality food products. This prompted us to undertake regression models to estimate the Engel income elasticity. The regression output obtained in the study is summarized in Table- 3. The results show that the Engel income function for food performs much better than that of non-food in terms of the goodness of fit. The regression co-efficient are estimated to be statistically significant showing positive signs and values below 1. However the income co-efficient is higher in case of food than that of non-food.

The co-efficient of determination (R^2) also indicates that the Engel income regression for food has a greater explanatory power than that of non-food. The estimated income elasticity for food and non-food items is 0.91 and 0.53, respectively (Table- 4). Hence 1 per

cent increment in income induces a much greater percentage of expenditure on food than non-food. It can be concluded that given the income constraints, the absolute variables of poverty such as food consumption dominates. This once again asserts our earlier observation that the majority of selected households are poor.

If we consider the income-expenditure ratio as an indicator of the allocation of resources and surplus/deficit at the household budget level, we can get more revealing picture of the economic constraints and/or advantages. Thus an income-expenditure ratio above 1 is a clear measure of surplus of savings while the households could be net borrowers if this ratio falls below 1. The results show that the households in the lower strata have a greater tendency to spend their incomes on different items as compared to the households in medium and large holding. The income-expenditure ratio for marginal and small farmers is about 84 per cent and 74 per cent respectively which is found to be 67 per cent and 65 per cent for medium and large farmers (Table- 5). This ratio indicates that land poor households have little surplus available for savings/assets building as compared to the land rich households.

The above analysis pointed out that the households in the study area represent a mixed lot with differences in resource base and potentials for earning income. There are significant inter-class differences in average and per capita expenditure and income. More over there is a bulging of households in the lower strata with lower endowments of land. Another noteworthy feature is that it is dominated by households belonging to socially backward and economically under privileged section of the population. In view of these characteristics the vulnerability of the households in the flood prone area seems to be more than elsewhere which calls for dynamic and newer patterns of livelihood diversification.

Conclusions

Level of living of households is a heterogeneous process. It is differentiated in its causes and effects, by location, type of livelihood activities, income level, vulnerability and many other factors. The lower Ajay river basin is mostly flood affected area. The continuous unscientific and ruthless felling of trees and clearance of jungles for settlement has accelerated the soil erosion. More sediment is entering in to the river channel, reducing the cross-sectional area. This leads to spill over the river banks during excessive rain period. The rain bearing events is of high intensity and about 60 to 70 per cent of mean monthly rainfall occurs within a short duration. The lower Ajay basin's shape is funnel rather than elongated.

Change of slope in its longitudinal profile is another caused of flood. Bed level difference is another important factor for causing flood in the confluence periods of some tributaries. Apart from these physical factors, new anthropogenic interferences are also responsible for flood. The construction of river embankments on both sides of the river is some time also responsible for flood. The existing height of the embankments is unable to withhold the baneful discharge during peak flow period and thus flood occurs. So level of living of the households in the study area is almost different than the other area. In the study area people are survived 'to live with flood'. While government policies and programmes are made along sectoral lines, household livelihoods are highly diverse. Recognition of such diversity in policy formulation is quite important. Only with appropriate policies that recognise such diversity, will it be possible to eradicate poverty through livelihood diversification.

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