

Analysis of Diversifier and Non-Diversifier Farm Households in West Bengal

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ABSTRACT

Farmer's household economies are complex and diversified. Although, non-agricultural activities performed by farmers constitute a phenomenal growth but obtained very little attention from development research. This study looks into the strategic and extension role of different non-agricultural activities play in the livelihood securities of farmers and identified the comparative profiles of diversifier and non-diversifier farmers in West Bengal. This study presents evidence that non-farm and off-farm activities are carried out by adults make an important contribution to livelihoods. It was found that Average Diversification Index in the study area was 0.46. The study reveals that on socio-personal characters, the diversifiers were found significantly higher on family labour status but, significantly lower on dependency ratio. Similarly, on economic context, the mean values of diversifiers on material possession, resource mobilization potentiality, annual income and credit utilization behaviour were found significantly higher than those of non-diversifiers but the mean value of the variable distance from market was found significantly lower among diversifiers as against non-diversifiers households. On psychological background the diversifier farmers were higher on the characters of risk taking behaviour and innovativeness. The comparison between diversifiers and non-diversifiers on different livelihood assets reveals that the former differed significantly from the latter in education, family education status, contact with personal localite and awareness about diversification. The diversifier farmers were also found significantly different from non-diversifier farmers on availability of financial assets and extent to the local infrastructure. Despite the vast potentiality to diversify the livelihood towards farm and non-farm activities in the study area, there are problems such as negative perception of the community, outdated method of production, lack of improved technology and skills, lack of business start-up budget and absence of wide market intake of non-farm output. There are also lack of potential researches to study the effect of non-farm activities on farm production and to identify the major problems that hamper the non-farm sector.

Keywords: *Livelihood diversification; Diversification index; Diversifiers; Non-diversifiers;*

Diversification is the single most important source of poverty reduction for small farmers in South and South East Asia (FAO and World Bank 2001). Sustainable livelihoods have been increasingly recognized as important element of sustainable development during the past decade. Livelihood diversification refers to a continuous adaptive process whereby households add new activities, maintain existing ones or drop others, thereby maintaining diverse and changing livelihood portfolios. Rural economy is not based solely on agriculture but on a diverse array of activities and enterprises. Diversification consists of different diversified portfolio of activities maintaining over time and adjusted according to contingencies in order to

maximize return, spread risk, or achieve other household goals. By keeping the capability to operate a heterogeneous set of activities, diversifying households are likely to enjoy higher *flexibility* and *resilience* capacity than agricultural dependent rural households. Thus, in the light of the reiterated environmental, economic and political shocks affecting rural areas of developing countries, diversification has become increasingly attractive for many rural households during the last 30 years. The literature on livelihood diversification, which crosses several related fields and disciplinary approaches, is characterised by many terms and definitions. For the purposes of this paper, the definition of livelihood diversification chosen by Ellis is

used: Rural livelihood diversification is defined as the process by which rural households construct an increasingly diverse portfolio of activities and assets in order to survive and to improve their standard of living. (Ellis, 2000)

People diversify by adopting a range of activities. Thus income sources may include 'farm income', 'non-farm income' (non-agricultural income sources, such as non-farm wages and business income), and 'off-farm income' (wages of exchange labour on other farms – i.e. within agriculture, including payment in kind) (Ellis, 2000). The aim of the present paper is to study the comparative profiles of diversifier and non-diversifier farmers in West Bengal as well as the importance of livelihood diversification activities in improving farmers' economy are also studied.

METHODOLOGY

The study was undertaken in Uttar Dinajpur and Darjeeling district of West Bengal. These two districts represent different type of agro-climatic and socio-economic conditions of the state. Of these districts, two blocks from each district and two villages from each block were selected randomly by using simple random sampling method. From each village twenty farmers were randomly selected to constitute a total sample size of 160. Both secondary and primary data were used for the study. An interview schedule was developed based upon the information acquired during the explorative research phase and pre-tested prior to the survey. Data were analyzed using suitable statistical tools.

In this study, livelihood diversification refers to attempts by farmers and farm households to find productive ways to raise incomes by setting diverse portfolio of activities and assets in order to improve their standard of living and reduce different livelihood risk. A person or household with a diverse livelihood relies on several different economic activities. On the other hand, non-diversifiers households were depended on single economic activity of crop farming. Further, the income sources of the diversified households were grouped into seven distinct categories according to the intensive study of the area and after consultation with several experts. The income sources are crops, livestock, fisheries, forestry, non-farm, wages and

others includes remittance etc. Diversification index was measured with the help of Simpson index of diversity. The Simpson index of diversity is defined as:

$$SID = 1 - \sum_i P_i^2$$

Where, P_i as the proportion of income coming from source i . The value of SID always falls between 0 and 1. If there is just one source of income, $P_i=1$, so $SID=0$. As the number of sources increases, the shares (P_i) decline, as does the sum of the squared shares, so that SID approaches to 1. If there are k sources of income, then SID falls between zero and $1-1/k$. Accordingly, households with most diversified incomes will have the largest SID, and the less diversified incomes are associated with the smallest SID. For least diversified households (i.e., those depending on a single income source) SID takes on its minimum value of 0. The Simpson Index of Diversity is affected both by the number of income sources as well as by the distribution of income between different sources (balance). The more uniformly distributed is the income from each source, the SID approaches to 1.

RESULTS AND DISCUSSION

Livelihood diversification includes both on- and off-farm activities which are undertaken to generate income additional to that from the main household agricultural activities, via the production of agricultural and non-agricultural goods and services, the sale of waged labour, or self-employment in small firms, and other strategies undertaken to spread risk. As depict in Table no.1, majority of households i.e.; 71.88 per cent were diversified their livelihood in different income sources and rest around 28.12 per cent households maintained the single source of income for their livelihood.

Table 1. Distribution of households as per nature of diversification

Nature of diversification	No.	%
Diversifiers household	115	71.88
Non-diversifiers households	45	28.12
Total	160	100

The number of income sources is a measure of diversification used by different researchers in the past. However, the number of income sources as a measure of diversification may be criticized on several grounds.

First, a household with more economically active adults, all things being equal, will be more likely to have more income sources. This may reflect household labour supply decisions as much as a desire for diversification. Second, it may be argued that there is discrepancy when comparing households receiving different shares of their income from similar activities. For instance, a household obtaining 99 per cent of its income from farming and 1 per cent from wage labour has the same number of source of income as a household with 50 per cent of its income from farming and 50 per cent from wage labour. But, according to research target, and the actual diversification concept the household with 50 per cent of its income from farming and 50 per cent from non-farming sources has a more diversified income than another household obtaining more than 50 per cent of its income from farming and the rest from non-farming sources. This leads to a second measure of diversification. The definition of diversification relates to the number of source of income and the balance among them. The Simpson index of diversity is widely used to measure the diversity. Hill (1973), Validivia et al., (1996) used Simpson index to measure diversity. Joshi et al. (2003) also adopt the Simpson index to compare crop diversification in several South Asian countries. It is used here to measure livelihood diversity. The distribution of extent of diversification among different diversifiers is given in Table 2.

Table 2. Distribution of diversification index among diversifiers' households

Diversification Index		No.	%
Low	(Up to 0.358)	21	18.26
Medium	(More than 0.38-0.63)	69	60.00
High	(More than 0.63)	25	21.74
Total	115	100	

Average Diversification Index in the study area= 0.46

It is clear from just a glance at Table-1 that the majority of the diversifiers (60%) had medium level of Diversification Index as against only 21.74 per cent of diversifiers were under high level of Diversification Index. Diversification makes smooth flow of income to the household by reducing both predictable and unpredictable fluctuations. Predictable, seasonal fluctuations in income can be enhanced by combining enterprises and activities that generate returns during different times of the year. Unpredictable fluctuations

are those which create an unexpected loss in income, may be reduced by a diversified portfolio of economic activities.

Distribution of diversification index According to the per capita income of household: Extent of diversification varies households to households with farmers' socio-economic condition. Therefore, the households of farmers were divided into four groups according to their annual per capita income as presented in Table 3

Table 3. Diversification of livelihood and Per Capita Income of household (% of households)

Degree of Household	Per Capita Income				
	Poor	Medium	Fair	Rich	Total
Low (Upto 0.38)	4 (19.04)	8 (38.09)	6 (28.57)	3 (14.28)	21 (100)
Medium (> 0.38-0.63)	14 (20.28)	16 (23.19)	19 (27.54)	20 (28.99)	69 (100)
High (>0.63)	11 (44.00)	6 (24.00)	3 (12.00)	5 (20.00)	25 (100)
Total	29	30	28	28	115

The most important determinant of diversification is the degree of diversification of a household's livelihood strategy or, in other words, the way in which household members allocate their time in pursuit of various means of earning for living. A close perusal of the data in the Figure 1 revealed that majority of the poor farmers (44 %) adopted high extent of diversification as against only 20 per cent rich households adopted the same. This is because diverse rural incomes are associated with poor households that diversify in order to reduce risks associated with fluctuations in income from any given source. Similar was the observation made by Pederson and Annou (1999).

The extent of livelihood diversification among lower-income households is higher than among higher-income households. In fact, the pattern is more complex.

Diversification pattern of Darjeeling District : Darjeeling district showed an interesting pattern of diversification as shown in Figure 2. Thirty five per cent adults from sample household did not diversified their livelihood, they solely dependent on their base livelihood activities. While 33 per cent diversified into non-farm sector and 9% of them adopted livestock as their diversified activities. About, 8% of them took

temporary migration to cities. Farming constitutes an important vocation in addition to tea garden. Maize, paddy, citrus, zinger, gladiolus are the main crops particularly in the hill area. In hill agriculture, fragments (terrace) determine operational and managerial cost and extent of difficulties in inter-cultural operations, irrigation management etc., and this in turn affects both productivity and profitability. For every farm family there was some area used as homestead garden because of pattern of dispersed settlement. The effective use of homestead enterprise can influence livelihood securities for the small and marginal holding farm families. However, with respect to poor soil fertility and disrupted irrigation management, they couldn't make it profitable. The livelihood system in Darjeeling hills resolves around farming, tea garden, timber extraction, casual labour, handicrafts, and tourism.

Diversification pattern of Uttar Dinajpur District: Unlike Darjeeling hill, Uttar Dinajpur has comparatively productive and fertile agricultural land. Agriculture was the primary livelihood in the area. Many more diverse opportunities had come up in this area including crop, farm and non-farm sector. This was allowing people to take up different routes of diversification. In spite of this, 42 per cent of the adults from the sample household not diversified their livelihood (as indicated in the Figure 3). Some of them were reported that finance to start up business and required skill was the main constraints. Twenty per cent of them diversified into non-farm sectors including trading, services providing, artisanship and formal employment. About nine per cent of the adults from sample households diversified into off-farm activities in form of casual labour in kharif as well as dry season. While 14 per cent of them engaged in other secondary non-economic activities, including student, housework etc.

Comparison of the profile of diversifiers and non-diversifiers: The respondents of the two categories i.e; diversifiers and non-diversifiers were further compared on different variables such as socio-personal, economic psychological and different livelihood assets with a view to identifying those, which discriminated one group from the other groups. For this purpose, the data were obtained from diversifiers as well as non-diversifiers. The mean score of the diversifiers and non-diversifiers on each variables and 't' value of the difference between the two are given in Table-4, which reveals

that on socio-personal characters, the diversifiers were found significantly higher on family labour status but, significantly lower on dependency ratio. Similarly, on economic context, the mean values of diversifiers on material possession, resource mobilization potentiality, annual income and credit utilization behaviour were found significantly higher than those of non-diversifiers but the mean value of the variable distance from market was found significantly lower among diversifiers as against non-diversifiers households. On psychological background the diversifier farmers were higher on the characters of risk taking behaviour and innovative proneness. Among the different farm production variables the diversifiers were found having more number of livestock than non-diversifiers. The comparison between diversifiers and non-diversifiers on different livelihood assets reveals that the former differed significantly from the latter in education, family education status, contact with personal localite and awareness about diversification. The diversifiers were also found significantly different from non-diversifiers on availability of financial assets and extent to the local infrastructure.

The variables, which had been identified for their significance association with diversification, were also found significantly higher with diversifiers. Therefore, it can be concluded that these variables had real positive association with diversification. The smallholder household endowed with much labour but relatively little land will, in the absence of well-functioning land markets, typically apply some labour to their own farm, and some labor outside of their own farm for off-farm wage employment in agriculture as well as in different non-farm activities. The households with higher dependency ratio are not able to diversify, as they have to fulfill the basic needs of depended members. After meeting all the demand of the family members they don't have enough money to invest further. The psychological profiles such as high degree of risk taking behaviour and innovative proneness motivated farmers towards diversify their livelihood so that they can improve their standard of living. Diversification is also a means by which many individuals reduce risk. Households rationally allocate assets across activities to equalize marginal returns in the face of quasi-fixed complementary assets (e.g., land) or mobility barriers to expansion of existing (farm or nonfarm) enterprises. For the poorest,

Table 4. Comparison of the profile of diversifiers and non-diversifiers

S. No.	Variables	Div. N=115	Non-div. N= 45	't' value
A.	<i>Socio-personal:</i>			
1.	Age	2.54	2.44	0.886
2.	Caste	3.17	3.02	0.838
3.	Dependency ratio	1.33	1.77	-.856**
4.	Family labour	2.06	1.73	2.937**
5.	Indebtedness to money lender	1.46	1.62	-1.860
B.	<i>Socio-psychological:</i>			
6.	Risk taking behaviour	2.34	2.08	2.395*
7.	Innovation proneness	1.87	1.60	2.359*
8.	Aspiration	2.49	2.35	1.205
C.	<i>Socio-economical:</i>			
9.	Material possession	3.13	2.80	2.058*
10.	Distance from market	2.00	2.40	-3.067**
11.	Resource mobilization potentiality	3.17	2.66	3.150**
12.	Annual income	4.87	4.13	2.748**
13.	Credit seeking behaviour	2.97	2.57	1.609
14.	Credit utilization behaviour	2.09	1.66	2.510*
15.	Repayment of loan	2.05	1.82	1.283
D.	<i>Farm production:</i>			
16.	Size of land holding	2.47	2.02	1.846
17.	Land cultivated	1.29	1.20	0.996
18.	Number of livestock	2.96	2.02	3.410**
19.	Extent of cash crop	2.21	1.97	1.600
20.	Number of crop grown	3.54	3.66	-0.600
E.	<i>Human assets:</i>			
21.	Education	1.98	1.44	2.769**
22.	Family education status	2.42	2.11	3.148**
23.	Contact with personal localite	2.63	2.28	3.195**
24.	Contact with extension personnel	1.86	1.82	0.418
25.	Mass media exposure	2.24	2.02	0.041
F.	<i>Natural assets:</i>			
27.	Extent to natural capital	2.33	2.10	0.300
28.	Availability of financial capital	2.01	1.66	2.643**
G.	<i>Physical assets:</i>			
29.	No. of Physical assets in the locality	2.08	2.02	0.578
30.	Extent to the local infrastructure	2.06	1.84	2.828**
H.	<i>Social assets:</i>			
31.	Institutional infrastructure utilisation	1.80	1.66	1.136
32.	Social participation	1.44	1.26	1.702

* Significant at 0.05 level of probability;

** Significant at 0.01 level of probability;

Div.=Diversifiers; Non-div.=Non-diversifiers;

this typically means highly diversified portfolios with low marginal returns, or desperation-led diversification. Similar findings reported by Barrett (1997), Little et al. (1999).

In remote areas where physical access to markets is costly and higher distanced causes product markets failures, households diversify production patterns partly to satisfy own demand and diversification to other sectors remained less. Missing markets as well as credit can also discourage diversification. Barrett (1997) found the similar relationship and stated missing credit markets can impede diversification into activities or assets characterized by substantial barriers to entry. Smallholders typically cannot afford to purchase a truck and enter the long-haul transport niche of the food marketing channel, no matter how profitable it might be. If non-farm or off-farm options can be accessed easily with available credit markets and higher extent of local infrastructure, non-farm earnings can be a crucial means for overcoming working capital constraints to purchasing necessary variable inputs for farming (e.g., fertilizer, seeds, equipment, labor) or to making capital improvements. In the presence of working capital constraints, off-farm earnings may also be essential to maintain a viable farm but the ability to diversify into other segment not possible. Livestock holding also enhance diversification by providing supplementary income. Farmers earn their income through the direct sale of milk, but diversified farmers, with smaller herds, must transform milk into cheese, dahi, paneer for profit. Small-scale farmers may own livestock as a way to accumulate savings.

CONCLUSION

It is evident that irrespective of the level of development, families pursue a mix of activities for income stabilization and risk mitigation. This mix is generally across sectors, farm and non-farm and also option of migration. Significant numbers of adults from the sample households diversified their livelihood in different farm, off-farm and non-farm activities. The diversification activities were dependent primarily upon the context within which it is occurring. This includes the different access to diversification activities, market condition, development of infrastructures, social and human capital and the distribution of the benefits of diversification. This needs to be examined to make effective policy for sustainable development of the farmers.

Despite the vast potentiality to diversify the livelihood towards farm and non farm activities in the study area, there are problems such as negative perception of the community, outdated method of production, lack of improved technology and skills, lack of business start-up budget and absence of market for the non-farm output. There are also lack of potential researches to study the effect of non-farm activities on farm production and to identify the major problems that hamper the non-farm sector. State machinery should play a facilitator's role in terms of promoting investment in infrastructure such as road, electricity, irrigation facility etc. More of decentralised operations for government programmes, especially using the local institution for greater efficiency and better outreach programmes are needed. Availability of support services such as credit to diversifiers through appropriate changes in policies and delivery mechanisms should be ensured for sustainable development of the farmers going for diversification.

The results of the study have profound implications in redefining research and extension strategies towards a livelihood approach to rural development. Understanding the livelihood diversification of farmers with a multi-dimensional approach was attempted in the paper and the Livelihood Diversification Index developed for the purpose would be useful too for the researchers and policy makers to assess and compare the livelihood of different rural communities in the country. The poor farmers are not idle or worthless but we need to find them productive work and market for the goods they produce that will sustain their families. Social safety nets need to be widened and strengthen to those poor farmers who can never take advantage of the development process. Empowerments of people through social mobilization, encompassing the concept of self help transparency and accountability need to be pursued vigorously

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