Food Consumption Expenditure in Farm Households: Evidence from West Bengal and Jharkhand

–Bitan Mondal*, Debashis Sarkar**

ABSTRACT

One of the fundamental human needs is food. This cannot be suspended and replaced with other substances. Food cannot be denied to human beings and it plays a major role in national development. It also plays a role in maintaining economic, social, and political stability. However, household food consumption expenditures in developing countries have received significant attention in recent years because of the fast economic growth and increasing trepidation about food consumption. The present study has shown that the importance of family income has been found to determine the cost of food and non-food. Increasing income has proven to increase food expenditure. On the contrary, the expenditure on non-food has shown a decreasing trend. With the increase in the number of residents, the change in the budgetary provision of food is particularly related with the number of dependents. Increase in number reduces budgetary cost of non-food expenditure but expenditure on food increases. For the improvement of food and nutritional security in rural West Bengal and Jharkhand, policy criteria should be linked to their income expenditure on adequate food for a healthy living. It is clearly connected to policy instruments that increase income, such as increase in farm production and productivity, and increase in non-farm and off-farm employment.

Keywords: Income, Food, Non-Food, Consumption Expenditure, West Bengal, Jharkhand

* Assistant Professor, Department of Agricultural Economics Institute of Agriculture, Visva-Bharati, Sriniketan, Birbhum, West Bengal, India.

** Professor & Head, Department of Agricultural Economics Institute of Agriculture, Visva-Bharati, Sriniketan, Birbhum, West Bengal, India.
Email: debashis.sarkar@visva-bharati.ac.in

INTRODUCTION

One of the fundamental human needs is food and this cannot be replaced with other substances. Food forms a major pillar in national development. It also has a role in maintaining economic, social, and political stability. However, the household food consumption expenditures in developing countries have received significant attention in recent years because of the fast economic growth and increasing trepidation about food consumption. For example, Campbell et al. (2010) investigated the household rice expenditure in Bangladesh; Gale and Huang et al. (2006) and Yu and Abler (2008) explored the demand for food quantity and quality in China; and Nguyen (2014) analyzed food expenditure patterns of the households in Vietnam. Moreover, the strong link between food expenditures and income is well illustrated in consumer demand theory, and food expenditure share is commonly used as an important index of the household welfare and economic wellbeing (McDowell et al., 1997). Hopper (2011) demonstrated the close relationship between household income and the purchased quantities of milk, cream, cheese, eggs, meat, fish, fresh fruits, and fresh vegetables. Income is also found to be one of the most prominent measures of food consumption behavior (Muhammad et al., 2011). In India, various programs have been started by the government from time to time to reduce poverty by increasing income in rural areas. National Rural Employment Guarantee Act (NREGA) is a huge employment program started in India for the development of the rural areas. This law was later named the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA). This cross-cutting scheme has a legal guarantee to provide wages for 100 days in a financial year for adult members of any rural household who want to work as an unskilled manual labourer for minimum wage.

It is important to note that landless and small-scale (<1 hectare) families account for more than 50 per cent of the Indian population and half of the country's poor. On the one hand, the provision of extending extensive support to poverty and providing comprehensive livelihood security raises some fundamental questions of MNREGA as well as the small farm size of rural families. Is there any possibility of freeing the

peasant family from poverty and malnutrition? How can the level of living of the poor be enhanced to face poverty and increase the nutritional status? And can it guarantee help to improve the socio-economic conditions of the poor families? In some of the states and territories of India, through the geographical and socio-economic dimensions, the mobility of rural families has been examined several times, and a few questions have been raised with respect to food, non-food, nutrient status, and so on. In view of these, an effort has been made in this study to examine the pattern of food consumption of the farm households in two adjoining districts, i.e. Birbhum and Dumka of West Bengal and Jharkhand, respectively.

DATABASE AND METHODOLOGY

For this study, farm-level data on 300 farm households in Birbhum district (West Bengal) and Dumka district (Jharkhand) was collected. These farm families are mainly rural and farming is the major occupation. Popularly known as the "Food Basket", these districts have a lot of land resources. For example, different crops like rice, wheat, mustard, and potato are produced. In this study, the multi-stage random sampling technique was used for sample selection. Data was collected from primary sources. The primary data was obtained through the use of a structured schedule, copies of which were administered to the selected 300 farm households in these districts. The food consumption expenditure was analyzed using the Engel function and the regression model.

In order to determine the changes in consumption of food/non-food items with the changes in income, a linear regression model was applied. Food/non-food has been taken as the dependent variable. The model is:

$$Y = a + bX + e$$

where Y is the dependent variable measured as food/non-food expenditure per annum. The term 'a' is the intercept.

Income elasticity of food/non-food has been estimated by (1) Income elasticity (Food) – Co-efficient × mean of annual income/mean of expenditure on food and (2) Income elasticity (Non-food) – Co-efficient × mean of annual income/mean of expenditure on non-food.

Figures in parentheses indicate percentage over total.

Table 1: Distribution of Sample Households by Size-Class

Sr. No.	District	Size classes (in acre)							
		Marginal (0 - ≤ 2.5)		Small (2.51 - ≤ 5)		Medium (5.01 - ≤ 10)		All	
		No.	%	No.	%	No.	%	No.	%
1	Birbhum	102	68.00	41	27.33	07	4.67	150	100.00
2	Dumka	135	90.00	11	7.33	04	2.67	150	100.00
Overall		237	79.00	52	17.33	11	3.67	300	100.00

Source: Field Survey, 2016

RESULTS AND DISCUSSION

To begin with, the socio-economic characteristics of sample households are discussed, followed by a detailed analysis of the existing agricultural practices of the study area in terms of size-class of holdings. Table 1 shows the distribution of sample households by different size-class of farming. In the context of West Bengal and Jharkhand, it is customary to decompose the landholding pattern into four generally accepted size-classes, i.e. marginal, small, medium, and large. It can be seen that the small and marginal farming groups dominate the entire sample of households. On the whole, there is an accumulation of small and marginal holdings, which is 96% of the total households, while medium farming household accounts for around 4%. This clearly indicates that the majority of farmers in the study area belong to the land constraints groups. In particular, they face small and fragment pieces of land-inclined problems. This social composition of the population can be taken as a proximate indicator of economic status and resources. In the Indian context, it is traditionally seen that people belonging to the lower social strata most often constitute socio-economically underprivileged classes. It has been found that households belonging to the scheduled caste, scheduled tribes, other backward class, and minorities are usually resource-poor and have a low potential for generating income through allocations of their limited resources. Further, these groups of households do not have sufficient employment opportunities in the high-remunerative formal sector of occupations.

Table 2: Distribution of Sample Households by Caste and Size-Class

Size Classes	Caste-Wise Distribution of Households									
	General		OBC		SC		ST		All	
	No.	%	No.	%	No.	%	No.	%	No.	%
Birbhum										
Marginal	22	21.57	50	49.02	30	29.41	-	-	102	100.00
Small	23	56.10	10	24.39	08	19.51	-	-	41	100.00
Medium	07	100.00	-	-	-	-	-	-	07	100.00
Sub-total	52	34.67	60	40.00	38	25.33	-	-	150	100.00
Dumka										
Marginal	38	28.15	20	14.81	34	25.19	43	31.85	135	100.00
Small	-	-	-	-	03	27.27	08	72.73	11	100.00
Medium	04	100.00	-	-	-	-	-	-	04	100.00
Sub-total	42	28.00	20	13.33	37	24.67	51	34.00	150	100.00
All										
Marginal	60	25.32	70	29.54	64	27.00	43	18.14	237	100.00
Small	23	44.23	10	19.23	11	21.15	08	15.38	52	100.00
Medium	11	100.00	-	-	-	-	-	-	-	100.00
Sub-total	94	31.33	80	26.67	75	25.00	51	17.00	300	100.00

Source: Field Survey, 2016

Table 3: Land Particulars of the Sample Households (Acre)

Catego- ries	Land Holding Status						Irrigational Status		
	Owned	Barga	Leased- out	Fallow	Total	Operated Area	Irrigated	Un-Irrigated
Birbhum								
Mar- ginal	1.61 (96.41)	0.00	0.00	0.06 (3.59)	1.67 (100.00)	1.61 (100.00)	1.11 (68.94)	0.50 (31.06)
Small	2.67 (79.94)	0.58 (17.37)	0.00	0.09 (2.69)	3.34 (100.00)	3.25 (100.00)	2.92 (89.85)	0.33 (10.15)
Medium	7.33 (93.61)	0.00	0.00	0.50 (6.39)	7.83 (100.00)	7.33 (100.00)	5.00 (68.21)	2.33 (31.79)
Total	3.87 (90.42)	0.19 (4.44)	0.00	0.22 (5.14)	4.28 (100.00)	4.06 (100.00)	3.01 (74.14)	1.05 (25.86)
Dumka								
Mar- ginal	1.28 (100.00)	0.00	0.00	0.00	1.28 (100.00)	1.28 (100.00)	0.51 (39.84)	0.77 (60.16)
Small	3.42 (100.00)	0.00	0.00	0.00	3.42 (100.00)	3.42 (100.00)	1.44 (42.11)	1.98 (57.89)
Medium	7.00 (100.00)	0.00	0.00	0.00	7.00 (100.00)	7.00 (100.00)	2.87 (41.00)	4.13 (59.00)
Total	3.90 (100.00)	0.00	0.00	0.00	3.90 (100.00)	3.90 (100.00)	1.61 (41.28)	2.29 (58.72)
All								
Mar- ginal	1.45 (97.97)	0.00	0.00	0.03 (2.03)	1.48 (100.00)	1.45 (100.00)	0.81 (55.86)	0.64 (44.14)
Small	3.05 (89.97)	0.29 (8.55)	0.00	0.05 (1.47)	3.39 (100.00)	3.34 (100.00)	2.18 (65.27)	1.16 (34.73)
Medium	7.17 (96.63)	0.00	0.00	0.25 (3.37)	7.42 (100.00)	7.17 (100.00)	3.94 (54.95)	3.23 (45.05)
Total	3.89 (94.88)	0.10 (2.44)	0.00	0.11 (2.68)	4.10 (100.00)	3.99 (100.00)	2.31 (57.89)	1.68 (42.11)

Source: Field Survey, 2016.

Table 4: Demographic Features of the Sample Households (Number)

Categories	Marital Status		Family Size									Total
			Adult		Child		Total					
	Married	Unmarried	Male	Female	Male	Female	Male	Female				
Birbhum												
Marginal	0.67	0.33	2.83	2.02	0.87	0.67	3.70	2.69				6.39
Small	1.00	0.00	3.00	2.91	1.00	0.75	4.00	3.66				7.66
Medium	1.00	0.00	3.05	2.65	1.05	0.96	4.10	3.61				7.71
Total	0.89	0.11	2.96	2.53	0.97	0.79	3.93	3.32				7.25
Dumka												
Marginal	0.67	0.33	2.34	1.67	1.02	0.91	3.36	2.58				5.94
Small	0.75	0.25	3.32	2.74	1.50	1.01	4.82	3.75				8.57
Medium	1.00	0.00	3.19	2.17	1.01	0.76	4.20	2.93				7.13
Total	0.81	0.19	2.95	2.19	1.18	0.89	4.13	3.09				7.21
All												
Marginal	0.67	0.33	2.59	1.85	0.95	0.79	3.53	2.64				6.17
Small	0.88	0.13	3.16	2.83	1.25	0.88	4.41	3.71				8.12
Medium	1.00	0.00	3.12	2.41	1.03	0.86	4.15	3.27				7.42
Total	0.85	0.15	2.96	2.36	1.08	0.84	4.03	3.20				7.23

Source: Field Survey, 2016

On the basis of the survey data, it has been found that around 79% and 72% of marginal farms in Birbhum and Dumka districts, respectively, belong to the traditional backward social class (Table 2). The overall concentration of these poor groups is around 75%, which falls in the marginal category. The other backward caste and scheduled caste, together with scheduled tribe, dominates the social composition of the selected districts.

It seems that in the farming community land is the most limiting resource. It follows that the possibilities of income generation from land will depend on area under cultivation. It is also necessary to examine the potential productivity of available land, mainly in terms of irrigational status, as water is the leading input. The details about the land particulars including irrigational status are presented in Table 3. It has been found that average area of both owned and operated land in Birbhum is 3.87 and 4.06 acres, whereas both owned and operated land in Dumka are 3.90 acres. The leased-in and leased-out lands are common to almost all size-classes in Birbhum. However, this feature is absolutely absent in Dumka district. As expected, the small and marginal categories have low size of holding in comparison to the other groups. It is still the large category which commands the maximum operated land. Thus, even within the existing constraints, there is inter-class differences in deriving income opportunities, especially in the case of land resources. Looking at the status of irrigational facilities by different season, it has been found that there is a significant water scarcity during the summer season. Overall, it can be said that there is considerable inter-class inequality in quantitative acres of land being available for cultivation.

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 labor supply or the labor force is considered to be a valuable resource with respect to the earners. Labor force is defined as the magnitude of able-bodied potential workers who are capable of generating 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 15 to ≤ 59 years. Moreover, the number of children in the family (age below 15 years) represents a significant part of the dependency burden of the households. Nguyen et al. (2014) found similar pattern that socio-economic and demographic variables affect household expenditure on dairy products in Vietnam.

Table 5: Income of the Sample Household by Size-Class (Rs.)

Size-Class	Birbhum		Dumka		All	
	Average Income	Per Capita Income	Average Income	Per Capita Income	Average Income	Per Capita Income
Marginal	117006.90	25873.76	101007.80	23208.06	109097.20	24581.00
Small	206246.20	46227.59	204774.40	47780.68	205731.00	46757.05
Medium	312756.90	72976.62	252034.20	58161.73	302041.10	70338.35
Overall	212003.33	48359.32	185938.80	43050.16	205623.10	47225.47

Source: Field Survey, 2016

Table 6: Expenditure of the Sample Household by Size-Class (Rs.)

Size-Class	Birbhum		Dumka		All	
	Average Expenditure	Per Capita Expenditure	Average Expenditure	Per Capita Expenditure	Average Expenditure	Per Capita Expenditure
Marginal	98444.44	21769.04	85545.45	19655.34	92067.42	20744.30
Small	152846.15	34258.62	149428.57	34866.67	151650.00	34465.91
Medium	210750.00	49175.00	163333.33	37692.31	202382.35	47130.14
Overall	154013.53	35067.55	132769.12	30738.11	148699.92	34113.45

Source: Field Survey, 2016

In view of Table 5 and 6, an attempt has been made to consider the average age distribution of respondents by social group and size-class, which is presented in Table 4. It has been observed that the dependency burden of households in terms of the percentage of children who are outside the labor force varies across different castes, groups, and farming categories. Average male and female also vary according to size-class. Among the large holders the percentage of potentials workers is low. This reflects that relatively higher levels of land resources stand for greater economic insurance to the relatively affluent farmers. Another notable point is that the availability of labor force at the household level is not by itself a guarantee for enhancing levels of income. It depends on the existing employment opportunities and diversification of economic activities. Therefore, in the background of the existing social, demographic, and economic characteristics and constraints, it is essential to examine the income entitlements of the sample households.

Considering the average and per capita annual income, it has been observed that both average and per capita income increases with the increase in size of holding (Table 5). There is significant inter-class gap in income entitlements. Thus, average annual income of the medium farmers is more than two times higher than that of marginal and small farmers. If we compare two districts, it has been found that (a) both average and per capita annual incomes are higher in Birbhum as compared to Dumka for almost all farming groups and (b) the inter-class differences in income are prominent in both the districts. The difference seems to be slightly more pronounced in Birbhum. 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 invest in agriculture.

Income entitlements of the respondents pointed out a very low level of overall wealth situation of the families. However, as expected, income constraints has also created a constraint in expenditure (Table 6). There is a vast difference between the average and per capita expenditure at the household level in Birbhum and Dumka districts.

These findings do not confirm 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 pointed out that hardly any perceptible shift from food to non-food items and/or high-quality food products has occurred. Hopper (2011) pointed out the similar pattern of relationship between the income and expenditure on food. He

demonstrated a close relationship between household income and the purchased quantities of milk, cream, cheese, eggs, meat, fish, fresh fruits, and fresh vegetables. This prompted us to undertake regression models to estimate the Engel income elasticity. The regression output obtained in the study is summarized in Table 7. 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 coefficient are estimated to be statistically significant showing positive signs and values below one. However, the income co-efficient is higher in the case of food than that of non-food.

Table 7: Engel Income Functions in the Study Area

Description	Coefficient	Standard Error	t-Stat	R^2
Food				
Intercept	7176.97	1220.70	5.8794**	0.9430
X-variable	0.4282	0.0060	70.2739**	
Non-food				
Intercept	22443.18	860.15	26.09**	0.8065
X-variable	0.1513	0.0042	35.24**	

** Significant at five per cent level

The coefficient of determination (R^2) also indicates that the Engel income regression for food has greater explanatory power than that of non-food. The estimated income elasticity for food and non-food items is 0.98 and 0.53, respectively (Table 8). Hence, 1% 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.

Table 8: Engel Income Elasticity

Item	Mean of Annual Income	Mean of Expenditure	Income Elasticity
Food	205623.10	90231.11	0.98
Non-Food	205623.10	58468.81	0.53

The above analysis points out the fact 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 land holdings, irrigational endowments, availability of able-bodied labor force, as well as average and per capita expenditure and income. Moreover, there is an increase 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 underprivileged section of the society. In view of these characteristics, the vulnerability of the households in the rain-fed area seems to be more than elsewhere, which calls for dynamic and newer patterns of livelihood diversification.

CONCLUSION

Studies have shown that the importance of family income has been found to determine the cost of food and non-food. Increasing income has proven to increase food expenditure. On the other hand, the expenditure on non-food has shown a decreasing trend. With the increase in the number of residents, the change in the budgetary provision on food is particularly related with the number of dependents. More number of dependents reduces budgetary cost of non-food expenditure but expenditure on food increases. For the improvement of food and nutritional security in rural West Bengal and Jharkhand, policy criteria should be linked to their income expenditure on adequate food for healthy living. It is clearly connected to policy instruments that increase the income, such as increase in farm production and productivity, and increasing non-farm and off-farm employment.

With the production of vegetables and fruits to provide nutritious food sources, the inadequacy of nutritious food can be tackled by appropriate intercropping of different crops. In other parts of the country, in rural areas of West Bengal and Jharkhand, there is a need to provide proper formal education for the young people. However, advances in the "education-financial burden" of the farming family should be resolved at the policy level. The available options may include long-term convenient loans for scholarships. In order to increase the income of the rural population, there is a need to find out the possibility of land degradation deviation, which may then be used to solve unemployment issues.

REFERENCES

Campbell, A. A. (2010). Household rice expenditure and maternal and child nutritional status in Bangladesh. *The Journal of Nutrition, 140*(1), 189S-194S.

Campbell, A. A., Pee, S. D., Sun, K., Kraemer, K., Thorne-Lyman, A.,… Semba, R. D. (2010). Household rice expenditure and maternal and child nutritional status in Bangladesh. *The Journal of Nutrition*, *140*(1), 189-194. Retrieved from https://doi.org/10.3945/jn.109.110718

Hopper, W. C. (2011). Income and food consumption. *The Canadian Journal of Economics and Political Science, 9,* 487-506.

Huang, S., & Gale, F. (2006). China's rising fruit and vegetable exports challenge U.S. industries. Economic Research Service, U.S. Dept. Agr., FTS32001.

McDowell, D. R., Allen-Smith, J. E., & McLean-Meyinsse, P. E. (1997). Food expenditures and socioeconomic characteristics: Focus on income class. *American Journal of Agricultural Economics*, *79*(5), 1444-1451. Retrieved from https://doi.org/10.2307/1244359

McDowell, R., Allen-Smith, E., & McLean, M. (1997). Food expenditure and socioeconomic characteristics: Focus on income class. *American Journal of Agricultural Economics, 79,* 1444-1451.

Muhammad, A., Seale, J. L. Jr., Meade, B., & Regmi, A. (2011). International evidence on food consumption patterns: An update using 2005 international comparison program data. Technical Bulletin No. (TB-1929), p. 59.

Phuong, N. V., Cuong, T. H., & Mergenthaler, M. (2014). Dairy products expenditure pattern in Vietnam: Effects of household characteristics on expenditure for dairy products. Retrieved from http://ageconsearch.umn.edu/bitstream/187303/2/ Dairy%20products%20expenditure%20pattern%20in%20Vietnam%20Effects%20of%20household%20characteristics%20on%20expenditure%20for%20dairy%20products.pdf

Yu, X., & Ablet, D. (2008). The demand for food quality in rural China. *American Journal of Agricultural Economics*, *91*(1), 57-69.