A study on poverty of agricultural households in coastal saline zone of West Bengal

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ABSTRACT

A study was undertaken in Coastal and Saline Zone of West Bengal to measure the poverty among the agriculture households using Simple Random Sampling Without Replacement (SRSWOR). Extent of poverty was measured by Head-Count Ratio and Poverty-Gap Ratio. It was found that poverty existed among agricultural households in marginal and small size classes. In head-count measure about 48 per cent and 22 per cent of the agricultural households respectively in marginal and small size classes were found to be lying below poverty line (BPL). Overall, 41 per cent of the total agricultural households were found below poverty line. The extents of poverty of agricultural households below poverty line were measured 23.62, 8.30 and 20.00 per cent respectively in marginal, small and overall size classes by poverty-gap ratio measure. In this measure extent of poverty was estimated 20 per cent taking all the agricultural households into consideration. The highest disparity in income between agricultural households above and below poverty line was observed to originate from crop production, being a major source of income of agricultural households. Linear correlation analysis indicated a significant positive relationship between net income of agricultural households earned from crop production and each individual variables like size of operational holding, irrigated land and land allocated to non-food grain crops. A significant positive relationship was also observed between size of irrigated land and land allocated for non-food grain crops. Among the large number of crops grown by the agricultural households above poverty line (APL), the crop like cucumber, spinach and betelvine were not found to be grown by the agricultural households below poverty line. Not only the size of operational holding, irrigated land and area of land under non-food grain crops were recorded to be higher for the households above poverty line compared to the households below poverty line, level of net income per unit area was also estimated to be higher for the former than for the latter. Lower level of per capita non-farm income of the households below poverty line was found to be attributed to not only higher size of family but also to lower level of non-farm income per household as compared to those of the households above poverty line.

***Key words**:* APL, BPL, head count ratio, poverty, poverty gap ratio.

Poverty is an important issue at the perspective of the discussion of growth and development of an economy or sometimes the discussion of the former entails the analysis of latter and indicates their direction and dimension in an economy. Whatever may be, the issue of poverty is frequently discussed at home and abroad by academicians, policy makers planners and administrators. Poverty and unemployment are twin problems in Indian Economy. Though the problem of poverty is at a low ebb, still it is alarming one in our economy. This is so more in rural India. More than 25 per cent people in India are lying below poverty line. Poverty line in India was specified at Rs. 49.09 and Rs. 56.44 at 1973-74 price for rural and urban areas respectively by Panning Commission on the basis of monthly per capita consumer expenditure on food and non-food items of goods. A nutritional norm of 2435 and 2095 calorie per capita per day was taken by the Commission as the basis of poverty threshold for rural and urban areas respectively.

So many studies have been conducted on poverty from different points of views. Some of these studies for estimating poverty lines were carried out by some academicians at different points in time. At 1960-61 prices monthly per capita consumer expenditures of Rs. 15 in rural areas and Rs. 22.50 in urban areas were suggested to be the 'poverty line' by Dandekar and Rath (1971) who used consumer expenditure data from 16th Round of National Sample Survey relating to 1960-61. On an average calorie requirement was considered as 2250 per capita per day in their study. Consumer Price Indices for Agricultural Labour (CPIAL) prepared by Labour Bureaue was used by Bardhan (1970). CPIAL was constructed on the basis of monthly retail prices of 75 consumer items collected from selected rural areas. The state specific poverty lines at current prices for the years 1972-73, 1973-74, 1977-78 and 1983 were worked out by Kakwani and Subbarao (1986) on the basis of state – specific price relatives for the year 1963-64 estimated by Bhattacharya and Chatterjee (1974) and CPIAL available at the state level.

This micro-level study on poverty was confined to the agricultural households of coastal saline zone of West Bengal. Objective of the study was set out as follows :

i) To find sourcewise annual level of income of agricultural households.

ii) To measure the extent of poverty of agricultural households.

iii) To compare sourcewise income of agricultural households above and below poverty line.

iv) To find some factors causing rural poverty of agricultural households from this study.

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MATERIALS AND METHODS

The study was mainly based on primary data collected from fifty six agricultural households which accounted for thirty per cent of the total in Haribasar and Santrapara villages of Kakdwip block under South 24 Parganas district belonging to the Coastal Saline Zone of West Bengal. Data were collected from sample agricultural households on areas under different crops, costs, prices of various crops, returns from animal husbandry, income earned from non-farm activities, family size, etc. Poverty of agricultural households was measured by Head-Count Ratio and Poverty-Gap Ratio.

Head-Count Ratio (HP) = n/N, where n is number of people or households who have income below poverty line, N is total number of people or households.

Poverty - Gap Ratio $(P_g) = Hp \frac{\sum_{i=1}^{n} Z - \overline{Y}}{\sum_{i=1}^{n} Z}$,

where $Z - \overline{Y}$ is poverty gap; Z is poverty line income of people or households lying below poverty line and $\overline{Y}$ is average income of households lying below poverty line, HP is head count ratio (percent).

According to state-specific poverty estimates for 1999-2000 by Panning Commission of India poverty line was Rs. 350.17 per capita per month expenditure for rural areas of West Bengal. In this study agricultural households having income below this poverty line were regarded as poor households. Tabular method of analysis alongwith statistical analysis for working out Simple Correlation Coefficient was exercised in the study.

RESULTS AND DISCUSSION

Income of rural households was estimated for all the size classes of farms existing in the area under study. Rural agricultural households were found to earn their incomes from various sources like crop production, animal husbandry and non-farm activities of different natures. Source wise incomes of agricultural households are presented in table 1. Average income per household earned from crop production was noted to be a function of size of operational holding. Income earned from animal husbandry was observed to be higher across larger size class of farms. Non-farm income per household was found to be the highest in small size class of farms. Average income per household earned from all the sources was estimated to be the highest for small size class of agricultural households. The highest income of this size class was attributed to the largest non-farm income. Per capita income which reflects economic condition of households was also found to be the highest for small size class of farm households. The highest per capita income of this size class was attributed to the highest average income per household and lowest average size of family.

Annual level of income of each individual agricultural household was compared to its estimated level of poverty line income for measuring poverty in terms of head-court ratio. Table 2 exhibits size classwise incidence and extent of poverty of agricultural households. It was found that poverty prevailed in marginal and small size classes of agricultural households. In head-count ratio measure about 48 per cent of agricultural households in marginal size class were found to be lying below poverty line. The corresponding figure for agricultural households in small size class was 22. Semi-medium size class of households was not found to record incidence of poverty. Overall extent of poverty among agricultural households measured by head-count ratio was estimated as 41 per cent. Measurement of poverty in terms of head-count ratio (per cent) was also exercised in respect of population. About 54 per cent of the population was found to be lying below poverty line in marginal size class of households. Poverty striken people accounted for 30 per cent of the total population in the small size class of agricultural households. Irrespective of the size classes of agricultural households, the extent of poverty among population was measured as 47 per cent in terms of head-count ratio.

Poverty-gap ratio among marginal size class of agricultural households lying below poverty line was found to be 23.62. Among the poor agricultural households in small size class poverty-gap was recorded to be 8.30. Extent of poverty measured either by head-count ratio or poverty-gap ratio was found to be larger among marginal size class of agricultural households than that among small size class of agricultural households.

An estimation of yearly income of agricultural households above and below poverty line was also attempted with the objective of finding source-wise difference in income between these two categories of households. Source-wise income of agricultural households above and below poverty line is presented in table 3. It is evident from the table that average income earned from different sources were higher for the APL households than those for the BPL households with the exception of average income earned from animal husbandry. In marginal size class of farm the highest degree of disparity in income was observed in the case of crop production. The highest degree of disparity in income was found to stem from non-farm activities in the case of small size class of farm. Irrespective of size classes of agricultural households the largest extent of difference in income of households above and below poverty line was viewed to originate from the income earned from crop production.

As the highest disparity in income between agricultural households above and below poverty line originated from the income accruing from crop production, distribution of land and other associating variables were assumed to determine the levels of income of agricultural households above and below poverty line. In this respect some agro–economic indicators likely to attribute to disparity in income between two categories of agricultural households and affecting poverty of households are presented in table. 4.

It was noted from the table 4 that size of operational holding, irrigated land, area of land under non-food grain crops, gross cropped area and variable cost per cropped hectare of the agricultural APL households were larger than those of the BPL households in marginal size class. In the case of small size class, size of irrigated land and area of land under non-food grain crops were found to be higher for the APL agricultural households than those for the BPL agricultural households. In the same size class a reverse picture was viewed so far variables like size of agricultural holding and gross cropped area were concerned. BPL households were found to possess larger size of operational holding with higher intensity of cropping as compared to the households above poverty line. However, irrespective of the size class, the APL agricultural households were noted to be placed in a superior position than the BPL agricultural households invariably for all the variables taken into consideration.

The variables like size of operational holding, area of irrigated land, area of land under non-food grain crops, area of gross cropped land and variable cost incurred per cropped hectare were taken for finding relationship with net income earned from crop production, being a major source of income of agricultural households. Values of correlation coefficient 'r' are presented in table 5. A significant positive relationship was found to exist between size of operational holding and net income earned from crop production. Same relationship was noted between area of irrigated land and net income earned from crop production. Area of land under non-food grain crops was found to bear significant influence on changing the level of income from crop production. No significant relationship was found to exist between agricultural income and each of the variables like gross cropped land, variable cost per cropped hectare.

It was observed from the values of coefficient of correlation that size of operational holding, irrigated land and land allocated to non-food grain crops were important factors for increasing agricultural income and hence reducing extent of poverty of households. Size of operational holding of individual households lying below poverty line would be increased at the cost of reduction of size of operational holding of households above poverty line. But this would result in decline in the level of household income of the latter. Average size of operational holding of agricultural households above poverty line was recorded to be maximum as 2.444hectare which is evident from table 4. Moreover, the BPL agricultural households could not afford to purchase land due to paucity of fund. So in this study size of operational holding was not treated as an effective factor for enhancing agricultural income of the households. It was also clear from table 4 that area of irrigated land was an increasing function of area of land under non-food grain crops, which beared a significant relationship with agricultural income of households. So alleviation of poverty of agricultural households was considered to be linked up with increase in agricultural income, which in turn needed to be connected with allocation of land to non-food grain crops through development of irrigation facility.

It was observed through table 3 that agricultural income i.e. income earned from crop production of agricultural households above and below poverty line differed from each other to a great extent. This was also true across all the size classes of agricultural households above and below poverty line. Not only differences existed between these two categories of agricultural households in respect of size of operational holding, irrigated land, area under non-food grain crops etc., a considerable disparity between two categories of households was observed with regard to net income estimated per unit area. The same matter alongwith crop profile and per capita non-farm income is displayed in table 6. As regards crop profile, it was found that both the categories of agricultural households grew a number of crops. Crops like cauliflower, cowpea, tomato, bhindi and boro paddy were not found to be grown in marginal size class of agricultural households above poverty line. On the other hand, crops like betelvine, cucumber and spinach were not grown in the same size class of BPL agricultural households. A wide difference in crop profile was viewed across the small size classes of agricultural households above and below poverty line. Irrespective of the size classes, the crops like cucumber, spinach and betelvine were not found to be included in the crop profile of BPL agricultural households. There was no report of growing crops like tomato and boro paddy by the APL agricultural households. Cucumber and spinach were reportedly grown by few agricultural households. It was also found that there was a significant relationship between area of land under betelvine crop and net agricultural income of the households. The coefficient of correlation between these two variable was estimated as 0.736.

Though agricultural income was a major component of household income, an attention needed to be paid to non-farm income. Non-farm income also played an important role to uplift agricultural households above poverty line from below poverty line. A comparison between agricultural households above and below poverty line in respect of non-farm income revealed that there was a considerable difference in per capita income. Per capita incomes of both the marginal and small size classes of households above poverty line were found to be higher than those of the respective size classes of the households below poverty line. Though the size of family of BPL agricultural households was larger than that of APL households, the lower level of per capita income of the former was not entirely attributed to the difference in size of family. A wide difference in per capita income between two categories of agricultural households was largely attributed to the disparity in average non-farm incomes as furnished in table 3.

REFERENCES

Ahluwalia, M. S. 1978. Rural poverty and agricultural performance in India. *J. Dev. Studies*. **14** : 228-323.

Bardhan, P. K. 1970. On the minimum level of living and the rural poor. *Indian Eco. Rev.* **5** : 129-36.

Clark, S., Hemming, R. and Ulpha, Daving. 1981. On Indices for the measurement of poverty. *Eco. J*. **91** : 515 – 25.

Chatterjee, Biswajit and Ghosh, Dilip Kumar. 2001. In search of a district development index. *State Institute of Panchayat and Rural Development*, Kalyani, West Bengal. pp. 30-34.

Dandekar, V. M. and Rath, N. 1971. Poverty in India. *Eco. Pol. Weekly*. **6** : 25– 48.

Das, N. G. 1990. *Statistical Methods in Commerce, Accountancy & Economics.* M. Das & Co., Kolkata. pp. 309 – 28.

Kakwani, N. and Subbarao, K. 1990. Rural poverty and its alleviation in India. *Eco. Poli. Weekly*. **25** : A2 – A16.

Kundu, Amitabha. 1981. Measurement of poverty : some conceptual issues. *Anvesak*. **11** : 80-96.

Minhas, B. S., Jain, L. R., Kansal, S. N. and Saluja, M. R. 1987. On the choice of appropriate consumer price indices and data sets for estimating the incidences of poverty in India. *Ind. Eco. Rev.* **12** : 19-49.

Table 1 : Agricultural households profile in different size classes of farms

Size class	Number of household	Average size of family	Average size of operational holding (ha)	Net income earned from crop production (Rs.)	Net income earned from animal husbandry (Rs.)	Total farm income (Rs.)	Non-farm income (Rs.)	Total income (Rs.)	Per capita income (Rs.)
Marginal (<1 ha)	44	5.32	0.3186	603617 (13718.56)	103053 (2342.11)	706670 (16060.68)	426805 (9700.11)	1133475 (25760.79)	4842.25
Small (1-2 ha)	9	4.45	1.2118	155149 (17238.77)	10961 (1217.88)	166110 (18456.66)	270050 (30005.55)	436160 (48462.22)	10890.38
Semi-medium (2-4 ha)	3	6.00	2.4444	82899 (27633.00)	1235 (411.66)	84134 (28044.66)	17076 (5672.00)	101150 (33716.66)	5619.44
All farms	56	5.21	0.5760	841665 (15029.73)	115249 (2058.01)	956914 (17087.75)	713871 (12747.69)	1670785 (29835.44)	5726.57

N.B.: Figures in parentheses indicate average income per household in the concerned size class in respect of each of the sources of income.

Table 2 : Extent of poverty in the sampled households.

Size class	Per cent of households having income below poverty line	Head-court ratio in respect of households (in per cent)	Head count ratio in respect of population (in per cent)	Average income of households lying below poverty line (in Rs.)	Poverty line income of all households (in Rs.)	Income gap of all households (in Rs.)	Poverty gap ratio
Marginal	91.3	47.72	53.84	12731.00	529456.08	262105.08	23.62
Small	8.7	22.22	30.00	15785.50	50424.24	18853.24	8.30
Semi-medium	-	-	-	-	-	-	-
All farms	10.0	41.07	47.26	12996.60	579880.32	280958.32	19.89

Table 3 : Source-wise income of agricultural households above and below poverty line

Size class	Income from crop production (Rs.) of		Income from animal husbandry (Rs.) of		Income from non-farm activities (Rs.) of		Difference between average incomes of households above and below poverty line (Rs.)		
	Household above poverty line	Household below poverty line	Household above poverty line	Household below poverty line	Household above poverty line	Household below poverty line	Crop production	Animal husbandry	Non-farm activities
Marginal	501190 (21790.86)	102427 (4877.47)	80194 (3486.69)	22859 (1088.52)	284740 (12380.00)	142065 (6765.00)	16913.39	2398.17	5615.00
Small	129523 (18503.28)	25626 (12813.00)	8316 (1188.00)	2645 (1322.50)	266750 (38107.14)	3300 (1650.00)	5690.28	134.50	36457.14
Semi-medium	82899 (27633.00)	-	1235 (411.66)	-	17016 (5672.00)	-	-	-	-
All farms	713612 (21624.60)	128053 (5567.52)	89745 (2719.54)	25504 (1108.86)	568506 (17227.45))	145365 (6320.21)	16057.08	1610.14	10907.24

N.B.: Figures in parentheses indicate average income per household in each size class

Table 4 : Some socio-economic indicators of agricultural households lying above and below poverty line

Size class	Households above poverty line					Households below poverty line income				
	Average size of operational holding (ha)	Average size of irrigated land (ha)	Average area of land under non-food grain crops(ha)	Average gross cropped area (ha)	Variable cost per cropped hectare (Rs.)	Average size of operational holding (ha)	Average size of irrigated land (ha)	Average area of land under non-food grain crops (ha)	Average gross cropped area (ha)	Variable cost per cropped hectare (Rs.)
Marginal	0.3984	0.1208 (30.32)	0.1135 (28.49)	0.5249 (131.75)	12278	0.2311	0.1044 (45.17)	0.1006 (43.53)	0.4251 (183.94)	7602
Small	1.1714	0.2408 (20.55)	0.2408 (20.55)	1.4836 (126.65)	8664	1.3533	0.0866 (6.39)	0.0866 (6.40)	2.5433 (187.93)	5450
Semi-medium	2.4444	0.0444 (1.81)	0.0444 (1.81)	2.6222 (107.27)	3804	-	-	-	-	-
All farms	0.7484	0.1320 (17.64)	0.1273 (17.00)	0.8871 (118.53)	9159	0.3287	0.1029 (31.30)	0.0994 (30.24)	0.6093 (185.36)	6821

N.B.: Figures in parentheses indicate percentage of total operational holding in respective size classes. Figures in parentheses under column 4 represent cropping intensity

Table 5 : Simple correlation coefficients (r) between some variables and net income per farm accrued from crop production

Sl. No.	Variables	Value of 'r'
1.	Size of operational holding	0.4292**
2.	Area of gross cropped land	0.2499
3.	Area of irrigated land	0.5639**
4.	Area of land under non-food grain crops	0.5459**
5.	Variable cost per cropped hectare	0.1343

N.B.: ** significant at 1% level of probability

Table 6 : A comparison between agricultural households above and below poverty line.

Size class	Size of family for		Net income per				Crop profile of agricultural households		Per capita non-farm income for	
			Net cropped hectare for household		Gross cropped hectare for household					
	APL	BPL	APL	BPL	APL	BPL	APL	BPL	APL	BPL
Marginal	4.69	6.00	54695.93	21105.45	41514.30	11473.70	Aman paddy, chilli, potato, onion, betelvine, lathyrus brinjal, cucumber & spinach	Aman paddy, chilli, potato, cauliflower, brinjal, cowpea, tomato, bhindi, lathyrus, onion & boro paddy	2639.66	1127.50
Small	4.00	6.00	15795.86	9467.96	12471.87	5037.94	Aman paddy, chilli, bhindi, lathyrus, cowpea, betelvine, cauliflower, potato, cucumber & binjal	Aman paddy, chilli, potato, lathyrus and onion	9526.78	275.00
Semi-medium	6	-	11304.61	-	10538.09	-	Aman paddy, lathyrus & chilli	-	945.33	-
All farms	4.66	6.00	28894.44	16937.99	24376.73	9137.56	Aman paddy, chilli, potato, onion, lathyrus, brinjal, cucumber, spinach, bhindi, cauliflower & betelvine	Aman paddy, chilli, potato, onion, lathyrus, brinjal. bhindi, cowpea, cauliflower, tomato and boro paddy	3696.88	1053.36

APL- above poverty line and BPL- below poverty line.