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Money Metric Poverty and its Correlates – A Case Study in Tripura

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Abstract: Present study seeks to apply the Money-Metric Approach of poverty measurement, a prevalent method used to quantify poverty based on income or consumption levels which mean that an individual or household is considered as poor if his income or consumption level falls below some bare minimum level (poverty threshold or poverty line) essential to meet his basic needs. The study reported here uses primary data which is collected from a field survey of 120 households from the rural areas of West Tripura District, Tripura. It is reasonably obvious that strategies aimed to reduce the incidence of poverty essentially rely on identification of factors that are strongly linked with poverty. In that direction Binary Logit Regression analysis is used to find out different socio-economic and demographic factors that help in perpetuation of poverty at household level. The study shows that age of the household head, household size, education level of the household head and marital status of the household head are found to be significant predictor of household poverty status.
Keywords: Household, Logit Model, Money Metric
JEL Code: I3, I32

INTRODUCTION

Statement of the Problem

Poverty is a multifaceted event in nature with physical, economic, social and psychological dimensions. A common method used to measure poverty is based on incomes or consumption levels which mean that an individual or household is considered as poor if his income or consumption level falls below some minimum level (poverty threshold or poverty line) necessary to meet his basic needs. The study is organised as follows. It begins with introduction in the first section which is followed by the literatures reviewed in the second section. In the third section, the methodology of the study is described and the fourth section delves into the major finding and results of the study. The last section contains the conclusion.

As like India as a whole, Tripura has also been at the realm of poverty since long. Long-term strategy of poverty eradication of the State Government is going on along with "Approach to Peoples Plan in Tripura" which was formulated in 1996 by the State Planning Board. The Planning Commission's data shows that on the basis of Head Count the percentage of poor people in Tripura stands at 52.67 percent (NSS 28th round), 59.82 percent(NSS 32nd round), 42.60 percent (NSS 38th round), 39.35 percent (NSS 43rd round) and most recently at 40.04 percent(NSS 55th round). In the urban areas of the state also, the prevalence of poverty of considerable magnitude has been quite visible. As per NSS 55th round, the urban poverty is 7.47 percent. Thus poverty is still a serious problem in Tripura. Officially, poverty and inequality measures for Tripura as well as for other north-eastern states are not calculated separately except Assam. The poverty and inequality measures of Assam are used for other north-eastern states including Tripura following the recommendations of the Report of the Expert Group on Estimation of Proportion and Number of Poor (1993). As a result of this practice of adopting poverty and inequality measures of Assam for the rest of north-eastern states, there is no independent information available on the trends of poverty and inequality for Tripura. For the present study, poverty and inequality measures are calculated using primary level data from the consumption expenditure surveys. The poverty line adopted for the purpose of calculating poverty measures is based on the poverty line Rs 798 in rural area of Tripura specified by the Planning Commission for Tripura for the year 2013. The present study seeks to apply the Income approach to measure poverty and to find out the correlates of poverty in rural Tripura which is socioeconomically a backward and geographically an isolated state of Northeast region of India.

Importance of the study

The approach to measure poverty solely in terms of income/consumption has been widely criticized in the literature of welfare and wellbeing. It is argued that to understand the complex phenomenon of poverty or to evaluate household or individual wellbeing, a more comprehensive exercise is necessary. The analysis of the determinants of poverty is multivariate. It extends the analysis of the poverty profile by attempting to infer the causality of specific household characteristics on household welfare. It attempts to answer the question of how a particular variable affects poverty conditional on the level of other potential poverty determinants. It goes beyond the poverty profile of assessing mere correlation of the characteristics of a household with its poverty status to consider the causes of poverty at the household level. The results of these determinants of poverty analysis exercises should be of particular interest to policymakers since they provide a means to assess the likely impact of a range of specific government policies aimed at improving the welfare of people. Keeping this in mind the study attempts to identify socio-economic and demographic factors which help in perpetuation of poverty at household level of the selected study area.

Objectives

The study addresses two objectives. These are as follows

- To identify the determinants of household poverty in rural areas of West Tripura.
- To provide policy recommendation to check poverty.

REVIEW OF LITERATURE

From an empirical point of view, there have been a number of studies which shed light on the factors that can contribute to one's poverty status. These studies either look at the characteristics of the household as a whole or that of the household head as possible determinants of poverty. Glewwe [3] shaded light on the factors that can contribute to one's poverty status. Household level determinants of poverty generally rely on the household level data. Age, gender of the household head and educational level are generally found to be some of the most important determinants of poverty. A logistic regression model based study of Rodriguez and Smith [10] to estimate the effect of different economic and demographic variables on the probability of a household being in poverty in Coasta Rica supports that poverty is deeper in the households where heads have lower level of education. However, study by Malik [6] shows that households where heads are in higher age group have a lower possibility of remaining as poor households. Moreover, years of schooling of the head of the household also significantly affect the probability of remaining in the poor group. Mehta and Omonona [8] carried out a study on poverty and its correlates among rural farming households in Nigeria. The data used for the study were obtained from 550 randomly selected farming households from two randomly selected ADP zones with the aid of well structured questionnaires. The data were analysed using descriptive statistics, FGT indices, stochastic dominance and Tobit regression model. The FGT analysis showed that the incidence, depth and severity of poverty among farming households decreased as the years of formal education of farm households heads, extent of output commercialisation, farm size, farm income and amount of agriculture loan received increased. But incidence of poverty, its depth and severity increased with increase in household size, age of household heads, number of children and adult dependency ratio, years of farming experience and distances to market, source of drinking water and health clinic. Arneberg and Pederson [1] have shown that household characteristics and education are the main factors which affect living standard. Moreover, they observed that transfer payment from relatives living abroad is a significant contributor to the welfare of a society. From their analysis they conclude that education is the most important factor for that way out of poverty. Geda *et al*. [2] have used household level data collected in 1994 to examine probable determinants of poverty status, employing both binomial and polychotomous logit models. The study shows that poverty status is strongly associated with the level of education, household size and engagement in agricultural activity, both in rural and urban areas. It is also found that households headed by males are found to have a lower probability of being poor compared to those headed by female. Oni and Yusuf [9] examined the determinants of expected poverty among rural households in Nigeria. The data for their study were obtained from the merged General Household Survey (GHS) and the National Consumer Survey (NCS) of 1996. The cross sectional data were augmented with certain covariate factors. The data were analysed by using three stage Feasible Generalized Least Squares (FGLS) method. Both idiosyncratic and covariate factors affected the expected log per-capita consumption of rural Nigerians. The overallexpected poverty for the country was 0.535 and this was 1.02 times the observed poverty in1996. Higher expected poverty was synonymous with living in the Northeast, having no formal education, farming, being an older or a male head of household, and having a large household.

METHODOLOGY

The details of the sampling design and tools of data analysis which has been applied in this study are discussed below.

The Study Area and Sampling Procedures

The area chosen for the study is rural area of West Tripura district of Tripura State, India. West

Tripura is one of the eight (8) districts of the state and the State Capital Agartala is located there.

While Tripura as a whole lies approximately between the north latitude 22 degrees 56' and 24 degrees 32' and between longitude 91 degrees 0' and 92 degrees 20' east, the West Tripura district lies approximately between latitude 23 degrees 16' to 24 degrees 14' north and longitude 91 degrees 09' east to 91 degrees 47' east.

Fig-1: Map of Tripura

The West Tripura District is bounded by Bangladesh in the north and west, by North Tripura in the east and by South Tripura in the south. Total area of the district is 3544 sq.kms. The district headquarters is located at Agartala, which is also the capital of the State.

The study made use of primary data which is obtained from household survey. A structured questionnaire is administered to some rural households in the study area to collect information regarding socio-economic, demographic characteristics of sample households and agricultural production as well as some indicators of household poverty level. Therefore, this research work was conducted using a comprehensive household income and expenditure survey of households in rural areas of selected district. Multistage sampling procedure was used for the selection of households. At first stage three villages were selected from each sub-division. Then at second stage from each village 40 samples (households) were selected. At the final stage, simple random sampling method was applied for the selection of sample units. So in total 120 sample households were surveyed.

Measurement of Poverty

Following the guidelines of the Planning Commission, Government of India, a household is defined as a poor household if the combined income of all its members is less than the household critical minimum level of income which is released by planning commission as poverty line for the rural household of Tripura. The critical minimum income for rural Tripura is given as rupees798 per month per person.

Regression Model

Let us consider a dichotomous variable Y where,

Y =1 if the household is income poor and
Y = 0 if otherwise

Let us also assume that P_i is the probability that the i^{th} household is having income poverty. Here the probability of a specific household being poor is determined by some household specific predictor variables (socioeconomic variables). We are considering that P_i follows logistic distribution and P_i is expressed as

$$\boldsymbol{P_i = \frac{1}{1 + e^{-(\beta_0+\beta_1 x_1+\beta_2 x_2+\ldots+\beta_6 x_6)}}}$$

For ease of exposition we can write

$$\boldsymbol{P_i = \frac{e^z}{1 + e^z}}$$

Where, $z = \boldsymbol{\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \ldots + \beta_6 x_6}$

As, P_i denotes the probability that the i^{th} household is below the poverty line then we can easily express $(1-P_i)$ term as the probability that the i^{th} household is not below the poverty line.

Logistic regression analysis is premised on the logit transformation of *P* given. The Logit function to be estimated is then written as:

$$\mathbf{z = \ln \frac{P_i}{1-P_i} = \alpha + \sum_{j=1}^{k} \beta_j X_{ij}} + U \qquad (2)$$

[In our case k = 120]

Where,
ln = Natural logarithm
P = the probability that the i^{th} household is below the poverty line
$(1-P_i)$ = Denotes the probability that the i^{th} household is not below the poverty line
α = Coefficient on the constant term
β_j = Coefficients of the jth explanatory variables

U = Error term

$\ln \frac{P_j}{1-P_j}$ is the natural log of the odds in favor of the household falling below the poverty line whereas β_j is the measure of change in the logarithm of the odds ratio of the chance of the poor to non poor household and can also be written as

$$\frac{\partial \log(\text{odd ratio})}{\partial X_j} = -\beta_j$$

Here, β_j is the measure of change in the logarithm of the odd ratio of the chance of the poor to non-poor household.

Table-1: The List of Explanatory Variables and Their Description

Variables	Name of the Variables	Description
Dependent Variable	Pov	Income based poverty (poor =1, non-poor = 0)
Explanatory Variable	Age_Head	Age of the household head in years completed
	Edu_Head	Education level of the household head (in years of schooling completed)
	H_Size	Household size (total members)
	Ern_H	Number of earning members of the household
	G_Head	Gander of head of the household head, Dummy
	Land	Ownership of land in hectares

EMPIRICAL FINDINGS

This section reports the results and findings of the study.

Socio-economic Characteristics of the Respondents

Here, we have taken eight variables to represent the socio-economic characteristics of the respondent household. The attributes are social groups, education of household head, gender of household head, household size, marital status, age of household head, primary occupation and Income groups.

Table 2 shows that the larger proportion of the house heads (75 percent) was males. Female house headship resulted from divorce, separation between the partners (husbands and wife) or death of the male heads of households

Table-2: Frequency Distribution of Respondents' Socioeconomic Characteristics

Socio-economic Characteristics	*Frequency*	*Percentage*	*Socio-economic Characteristics*	*Frequency*	*Percentage*
Social Groups			*Education of HH head*		
GEN	55	45.8	None	7	5.8
OBC	36	30	Primary (I-V)	33	27.5
SC	29	24.2	Junior secondary	47	39.2
ST	0	-	(VI-X)	16	13.3
			Senior secondary	17	14.2
			(XI and above)		
Gender of HH head			*Household Size*		
Male	90	75	< 3	11	9.2
Female	30	25	3 – 5	84	70
			6 – 8	21	17.5
			9 – 11	4	3.3
Marital Status			*Primary Occupation*		
Married	88	73.3	Agriculture		
Single	2	1.7	Government Job	38	31.7
Divorced	0	-	Daily Labour	18	15
Separated	0	-	Others	42	35
Widowed	30	25		22	18.3
Age of HH head			*Income groups*		
< 30	0		<5000	105	87.5
31 – 40	17	14.2	5000-10000	11	9.2
41 – 50	31	25.8	10001-15000	3	2.5
51 – 60	43	35.8	>15000	4	3.3
> 60	29	24.2			
Source: Authors calculation from the Field Survey 2012 **HH-Household*					

It can also be seen from the above table that 25.8 percent of the respondents falls between 41 – 50 years, while 14 percent were between 31–40 years. Majority of the house heads (73.3 percent were married, while 1.7 percent was single. However, 25 percent of the house heads were either widows, divorced or separated. About 13.3 percent of the respondents have at least senior secondary education, while 14.2 percent attained tertiary education. Only 5.8 percent of the household heads had no formal education while 27.5 percent had primary education. Majority of the sampled households earned below Rs.10000 per month while about 15 percent earned above 10000 per month. Mean household size is 4, 20.8 percent had at least six (6) members while 70 percent had household size between the ranges 3-5. These results confirm a fairly medium household size prevalent. About 31.7 percent of the respondents were farmers, 15 percent are engaged in govt job while 35 percent were daily labour.

Regression Results

The results of the logit regression on the determinants of poverty are shown in the Table 3. The result shows that age of the household head (Age Head) is found to be significant. The result indicates that an increase in the age of the household head is positively related to the probability of being a poor household. The coefficient value is positive (0.28) and also significant at 5% level. Again, education level of the household is found to have negative association with the probability of being a poor household which is indicated by the significant negative sign of the coefficient (-0.70) . Similar is the case of earning members of the household where negative association is found with the probability of being a poor household which is indicated by the significant negative sign of the coefficient (-1.063). Gander of the household head is not found to be significant in explaining poverty status of household. This may be because that women and children under the age 18 are eligible for many targeted government support grants. It is to be noted here that the Hosmer-Lemeshow goodness of fit statistic (13.196) shows significance of .102(>0.5) which means that it is not statistically significant and therefore our model is quite a good fit. Also the Nagelkerke's R^2 is found to be 0.653 (McFadden R-squared = 0.193) which indicates strong level of relationship between predictor and prediction.

Table-3: Result of the Logit Regression on Determinants of Poverty

Variable	Coefficient	Std. Error	Odd Ratio
C	-3.985056*	2.099460	1.028
AGE_H	0.027850	0.028001	0.932
EDU_H	-0.070192	0.087651	1.738
SIZE	0.552821***	0.204683	0.346
GAN	0.338639	0.939779	1.399
LAND	-1.686162	1.523251	0.183
ERNM	-1.063330**	0.492327	0.019
McFadden R-squared = 0.193100 Log likelihood = -33.21362 Hosmer-Lemeshow Statistics = 13.196		Akaike info criterion = 0.670227 Schwarz criterion = 0.832831 Hannan-Quinn criterion = 0.736261	

Source: Authors calculation

significant at 10%, **significant at 5%, * significant at 1%*

CONCLUSION

In this study we have undertaken data analysis relating to household social and economic and demographic characteristics using the primary data from selected villages of west Tripura district of Tripura. Analysis of the monthly per capita household income on the basis of FGT indices suggest that poverty exist in the rural areas of West Tripura district but it can be considered less frightening which is shown by the head count, poverty gap ratio and squared poverty gap ratio values. But a very interesting fact that came to knowledge is that though a very low percentage of people are living below poverty line but households who are above the poverty line mark are having very wide income inequality. That is distribution pattern of income is not smooth and homogenous. This means though the problem of primary poverty which is the absolute poverty is more or less solved but the relative poverty still exists with a troubling manner.

The result of the regression analysis on the factor influencing household poverty status shows that the of the household head, household size, education level of the household head and marital status of the household head are found to be significant predictor of household poverty status. Household size is a very significant indicator. Generally, increase in family size gives rise to the possibility of having more dependents and more poverty. Education level of the household head also plays very vital role. Higher level of education has correspondence with better job with higher income which diminishes the possibility of being poor. As far as Age of the household head is concerned, as many scholars' articles suggest that composition of

family changes with inclusion in old dependency and at the same time more unemployed young family members in the household.

While to talk about policy prescription we can say income generating activities has to be channelized more efficiently so that the income inequality across the household gets reduced. At the same time spread of education should be in more efficient way.

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