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## Abstract

*The paper conceptualizes chronic poverty by using the spaces of income and nutrition and estimates its incidence among states and social groups. It also aims to improve our understanding of the determinant of chronic poverty by considering economic, demographic and social factors. It attempts to answer the following questions: How important a determinant of chronic poverty is household income? What factors inhibit escape from chronic poverty? How different are the other poor from chronic poor? The analysis uses the unit level NSS and NFHS data.*

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# Estimation and Determinants of Chronic Poverty in India: An Alternative Approach

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Chronic Poverty (CP) has emerged as a major development concern in the developing countries<sup>1</sup>. The estimates of the prevalence of chronic poverty vary between 300 and 422 million; of which nearly half are inhabited in South Asia and one third in India (Hulme, Shepherd and Moore, 2001). Recent estimates show that the incidence of chronic poverty in India would be about 13-15 per cent, constituting half of the poor (Radhakrishna et al 2004). Clearly, efforts to reduce the chronic poverty in India will make significant effect on the global scenario. The recent studies in India have enriched our understanding of this problem to a large extent. The measurement and identification issues have received good deal of attention in these research efforts. Since chronic poor experience multiple deprivations over a long period, panel data are required for estimating the incidence and also identifying the CP households. Only a few studies have analysed the incidence of chronic poverty using data for a number of years panel provided by the ICRISAT for a very few villages in dryland areas of India (Gaiha 1989, and Gaiha and Imai 2002). Other studies have mostly been based on two period panel data (National Council for Applied Economic Research: 1986, Mehta and Bhide 2006). All these studies employed income for the measurement of chronic poverty. It is widely recognized that income poverty provides only a simplified view of poverty and conceptualization of poverty should extend beyond what is captured by money metric measure. Any reduction in income poverty may not, *pari passu* provide escape from other forms of deprivation<sup>2</sup>.

This paper conceptualizes chronic poverty by using the spaces of income and nutrition. A household is identified as chronic poor if its income is below the poverty line as well as its children and adults are suffering from malnutrition. There are several reasons for considering malnutrition along with income in the identification of chronic poor. First,

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<sup>1</sup> A large literature has emerged on conceptualization and measurement of the incidence of chronic poverty. See Hulme, Moore and Shepherd (2001).

<sup>2</sup> For instance, although reduction in income poverty reduces malnutrition, elimination of income poverty may not guarantee elimination of malnutrition. Moreover, in India, some of the middle income states have achieved better nutritional outcomes than higher income states (Radhakrishna et al 2004).

poverty and malnutrition are mutually reinforcing and poor households suffering from malnutrition find it difficult to escape the poverty trap. Empirical studies demonstrate that productivity is low for workers suffering from chronic energy deficiency (Satyanarayana et.al 1977, Deolalikar 1988). Hence, malnourished workers are at a disadvantage to obtain food required for nutritional needs. Bliss and Stern (1978) have investigated the link between productivity, wages and nutrition<sup>3</sup>. Second, the malnourished children of the poor families not only fail to achieve full genetic growth potential but also are exposed to greater child mortality risk. Additionally, they will grow up as less productive adults suffering from chronic illness and disability (Smith and Haddad 2000). The link between child-adult malnutrition leads to a family life cycle of poverty. Third, the risk of malnutrition is higher among children whose mothers suffer from chronic energy deficiency. Since current nutritional status of a mother depends on her childhood nutritional status, the vicious circle of malnutrition (mother-child-mother) leads to inter generational transmission of poverty. Clearly, nutrition theory of poverty explains why some households / individuals remain trapped in poverty for a longer duration even through the economy achieves higher growth.

This study attempts to estimate chronic poverty among states and social groups based on income poverty and malnutrition. It also aims to improve our understanding of the determinants of chronic poverty by considering economic, demographic and social factors. It attempts to answer the following questions: How important a determinant of chronic poverty is household income? What factors inhibit escape from chronic poverty? How different are the other poor from chronic poor?

These questions have been addressed by employing comparative analysis of the household characteristics of three groups viz., *chronic poor (CP)*, *other poor (OP)* and *non poor (NP)*. Chronic poor are those households below the income poverty line with at least one *stunted child*; the rest of the poor households are included in the category of other poor (OP) i.e. those poor households with no stunted child and non poor (NP) households are those whose income is greater than the income poverty line. Some of the conclusions from the comparative analysis have been validated by employing logistic regression analysis of the probability of a household belonging to the chronic poor category. Some of the issues examined here which relate to the movements over time of a poor household, ideally require

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<sup>3</sup> The positive effect of health and nutrition on wages and productivity has been brought out in a number of recent studies. See Strauss and Thomas (1998) for a review.

longitudinal data. Our inferences are subject to the same limitations as those of cross section analysis.

### **Data and Methodology**

The chronic poor are generally identified using longitudinal household panel data on consumer expenditure. Since the duration of existing nationwide surveys including NSS does not exceed beyond a year and since household specific consumption data is available for a reference period of usually one month, it is not possible to identify chronic poor defined as those living below the poverty line for a longer duration, say 5 years, directly from this data. To overcome this problem, Radhakrishna et al (2005) proposed two alternative criteria for identifying a chronically poor household: (a) poor household with atleast one stunted child and (b) poor household with a woman suffering from chronic energy deficiency. The prevalence of chronic poor in India is estimated to be 13.84 per cent based on the first criterion and 8.96 per cent on the second criterion. We employ the first criterion viz. presence of at least one stunted child in a poor household. Since stunting reveals long term deprivation, a household with a stunted child can assumed to be living in poverty for a longer duration.

The implementation of the above methodology requires household level data on per capita expenditure (for measuring poverty status) along with anthropometric measures of the children in the household (for determining child nutrition status). However, in India no nationwide survey provides data on both the variables. Therefore, Radhakrishna et al (2004, 2006) have suggested an approach to pool two different sets of data, viz. NSS and NFHS<sup>4</sup> to estimate the incidence of chronic poverty. The percentage of poor households in each state has been estimated using the monthly per capita expenditure (MPCE) data of NSS. The NFHS collected anthropometric data on heights and weights of children (0-3 years) from all the sample households. However, it does not include the data on household consumption. Instead, there is detailed data on the household asset base. A standard of living index (SLI) has been constructed using these data for each household<sup>5</sup>. For each state in India, the distribution of SLI has been matched with that of MPCE to identify the SLI cut-off

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<sup>4</sup> National Sample Survey (NSS) on household consumption expenditure are conducted periodically in all the states and union territories of India. The NSS data forms the basis for official estimates of poverty. The National Family and Health Survey (NFHS) conducted in 1998-99 was second such survey focused on the child and female health status in India.

<sup>5</sup> We followed the procedures of IIPS (2005) for constructing the SLI.

corresponding to the poverty line based on MPCE. If P is the poverty ratio corresponding to the poverty line z (MPCE), then

$$P = F_{nss}(Z) \quad (1)$$

where  $F_{nss}(\ )$  is the cumulative distribution of MPCE.

If  $F_{nfhs}$  (SLI) is the cumulative distribution of the SLI, the poverty line in terms of SLI corresponding to the poverty line Z is given by

$$SLI_z = F_{nfhs}^{-1}(P) \quad (2)$$

Given the poverty line, P can be estimated from (1) and by substituting the estimated P in (2),  $SLI_z$  can be estimated. Using the  $SLI_z$ , the poverty status of each NFHS sample household can be determined. A household is treated as poor if its SLI is less than  $SLI_z$ . Once the poverty status of the household is identified, we can use the anthropometric data to check if any child in that household suffers from stunting. Any poor household with at least one stunted child is then treated as chronic poor. In this paper, this methodology is extended further for analyzing the link between chronic poverty and labor market, by pooling NFHS and NSS data on employment.

The household ‘employment and unemployment’ survey of NSS 1999-2000 collected detailed information on several aspects of household participation in labor market. Both the NFHS and NSS (employment and unemployment) collect data on some common set of household level variables. We make use of this common set of variables and estimate a logistic regression to predict the household chronic poverty status from the unit level NFHS data. We specify

$$D_i = f(\text{CASTE}_i, \text{MLIT}_i, \text{FLIT}_i, \text{DPRATIO}_i, \text{HHSIZE}_i, \text{SLI}_i, \text{STATED}_i) \quad (3)$$

where,

$D_i$  is 1 if  $i^{\text{th}}$  Household is chronically poor and 0 otherwise

$\text{CASTE}_i$  is caste group of the  $i^{\text{th}}$  household

$\text{MLIT}_i$  is percentage of male literates in the  $i^{\text{th}}$  household

$\text{FLIT}_i$  is percentage of female literates in the  $i^{\text{th}}$  household

$\text{DPRATIO}_i$  is worker dependency ratio for the  $i^{\text{th}}$  household (ratio of non-workers to workers)

$\text{HHSIZE}_i$  is size of the  $i^{\text{th}}$  household

SLI<sub>i</sub> is standard of living index of i<sup>th</sup> household

STATED<sub>i</sub> is state specific dummy for the 17 major states in India.

Equation (3) can be estimated using the unit level data after identifying the chronic poverty status of each household as discussed above. The set of all independent variables used in (1) are also available in the NSS data set except SLI, which is an important determinant of chronic poverty. However, in the NSS data, we have monthly per capita consumer expenditure (MPCE) instead of SLI. Thus the non-availability of SLI in the NSS data has been overcome by estimating a link equation. The link equation is specified as

$$SLI_{ij} = f(MPCE_{ij}, STATED_j) \quad (4)$$

where SLI<sub>ij</sub> is the mean SLI of i<sup>th</sup> decile of j<sup>th</sup> state and MPCE<sub>ij</sub> is the mean MPCE of i<sup>th</sup> decile of the j<sup>th</sup> state and STATED<sub>j</sub> is dummy for j<sup>th</sup> state. Substituting (4) in (1), we obtain the chronic poverty function in terms of per person expenditure. Using this function, we can predict the probability that a household of the NSS is chronically poor. The household can be considered as chronic poor if P exceeds a specified value. We have fixed the probability for each state such that the incidence of chronic poverty as estimated from the NSS data set is same as or closer to the NFHS estimate.

Using Logistic regression analysis, equation (3) has been estimated from unit level data of the NFHS. The link equation (4) has been specified in log-linear form and estimated from state specific deciles data on SLI and MPCE computed respectively from NFHS and NSS data. The estimates are presented in Appendix Tables A1 and A2. The estimated functions give good fits. The estimated link equation shows statistically significant positive association between SLI and MPCE. The logit regression analysis shows that the coefficients of MPCE, dependency ratio and social (caste) status significantly influence the probability of a household falling into chronic poverty. This will be discussed further below. The coefficients of dummy variables are positive and large for Madhya Pradesh, Uttar Pradesh, Maharashtra and Punjab both in rural and urban areas.

### **Incidence and Characteristics of Poverty Groups**

The distribution of rural households by poverty and social and occupational groups is given in Table 1 and the distribution of urban households in Table 2. The figures in row 1 show the incidence of chronic poor (percentage of households below the poverty line with a

malnourished child), incidence of other poor (households below the poverty line without a malnourished child) and non-poor (households above the poverty line). The figures in rows 2 – 4 provide the incidence of poverty groups within each social (caste) group. Over all, the chronic poverty levels are sizeable; 13.6 per cent of the households in rural areas (Table 1) and 11.3 per cent of the households in urban areas are chronic poor (Table 2). These estimates show that the sub-group of chronic poverty constitutes about half of the poor households in both rural and urban areas. These numbers are almost identical with those provided by Radhakrishna et al (2006).

The incidence of chronic poverty varies significantly across the social and occupational groups. Among the social groups, it is highest for schedule castes (21 per cent in rural and 19 per cent in urban areas) and lowest for others (10 per cent in rural and 8 per cent in urban areas). The incidence among schedule caste is double to that of others. State-wise estimates also exhibit a similar pattern. Among the occupational groups, the incidence of chronic poverty in rural areas is highest for agricultural labour (19 per cent) and lowest for cultivators (9 per cent) and in urban areas it is highest for casual labour (24 per cent) and lowest for regular/salary group (7%). These figures clearly demonstrate that households depending on casual labour for livelihood are exposed to a greater risk of chronic poverty. As one moves from poverty groups to non-poor group, the occupational composition of the households tend to shift from agricultural labour to cultivators in rural areas and from casual labour to regular/salary earners in urban areas.

The social composition of chronic poor differs markedly from that of all households. The scheduled caste households constitute about one third of the rural chronic poor and nearly one fourth of urban chronic poor – the relative size of this poverty group among the chronic poor is larger than its size among all households. For instance, in urban areas, scheduled caste account for 23 per cent of the chronic poor whereas it accounts for 14 per cent of all urban households. It is worth mentioning that there are significant inter-state variations in the relative sizes of SCs and STs in chronic poor households. In rural areas the share of SC in chronic poor is as high as 84 per cent in Punjab and 66 per cent in Haryana and as low as 9.5 per cent in Assam and 14.0 per cent in Kerala and in urban areas it is as high as 61 per cent in Punjab, 58 per cent in Himachal Pradesh and 50 per cent in Haryana and as low as 5.3 per cent in Kerala. The relative sizes of various social groups are determined by their differences in the incidence of chronic poverty as well as their



differences in their shares in all households. This explains why relative size of SC in chronic poor is very high (84 per cent) in rural areas even though the incidence of chronic poverty among scheduled caste at 9.1 per cent is substantially lower than that of all India (21 per cent). Truly, the higher share of SC in Punjab rural chronic poor is due to higher incidence of chronic poverty among SC households (9.1 per cent) compared to the other social groups in rural Punjab as well as higher share of SC in all Punjab rural households.

The incidence of 'other poor' who are poor but do not suffer from malnutrition is 15 per cent in rural areas and 11.5 per cent in urban areas. These figures are very close to those of chronic poor. It can be broadly inferred that the poor are equally distributed between chronic poor and other poor. It is worth observing that the proportion of other poor among scheduled tribe households [14.0 (16.2) per cent] is lesser than that among scheduled caste households [20.9 (18.6) per cent] in rural (urban) areas. This is strikingly in contrast to the incidence of income poverty which is higher for STs as compared to SCs. This apparent paradox is due to higher incidence of malnutrition among SCs.

In summarizing, the core chronic poverty groups are scheduled caste among social groups in both rural and urban areas; among occupational groups they are agricultural labour in rural areas and casual labour and self employed in urban areas. There will be good deal of overlap between social and occupational groups. Further disaggregation of rural cultivator group by size of landholding and by quality of land (irrigated/dry) and urban self-employed group would help better identification of core chronic poverty groups.

**Table 1: Household Characteristics of Chronic Poor (CP), Other Poor (OP) and Non-poor (NP)****All India: Rural**

Description of Item/ HH Characteristics			Chronic Poor	Other Poor	Non-Poor	All HH
1	Distribution of HHs by Poverty Status in different Caste groups (%)	All	13.6	15.1	71.3	100
		ST	14.0	29.2	56.8	100
		SC	20.9	15.4	63.7	100
		OBC	12.0	14.4	73.6	100
		Others	9.9	10.5	79.6	100
2	Distribution of HHs by Poverty Status in different Occupational Categories (%)	Artisan	13.2	11.9	74.9	100
		Ag. Labour	18.9	23.3	57.8	100
		Non-Ag.lab	13.6	14.0	72.4	100
		Cultivator	9.3	12.7	78.0	100
		Others	11.6	5.3	83.1	100
3	Distribution of HHs by Sex of Head of HH (%)	Male	13.6	15.6	70.8	100
		Female	13.6	11.2	75.2	100
4	Distribution of HHs by Caste and Poverty Status (%)	ALL	100.0	100.0	100.0	100.0
		ST	11.4	21.4	8.8	11.1
		SC	34.1	22.6	19.7	22.0
		OBC	32.8	35.2	38.1	37.0
		Others	21.7	20.8	33.4	29.9
5	Distribution of HHs by Occupation and Poverty Status (%)	Artisan	13.0	10.6	14.0	13.4
		Ag. Labour	44.8	49.7	26.2	32.3
		Non-Ag.lab	8.0	7.4	8.1	8.0
		Cultivator	22.4	27.5	35.7	32.7
		Others	11.8	4.8	16.0	13.6
6.	Average no. of Persons, Children and aged per HH	HH Size	6.08	5.56	4.66	4.99
		Children	3.21	2.12	1.54	1.86
		Aged (60+)	0.32	0.33	0.37	0.36
7.	% Children (<15 yrs) to Total Persons	52.8	38.2	33.1	37.2	
8.	% of Aged (60+ years) to Total persons	5.24	6.02	7.87	7.12	
9.	Dependency Ratio	3.1	1.19	1.51	1.61	
10.	Percentage of Child Labour HHs	3.2	8.6	4.6	4.6	

HH: Household

**Table 2: Household Characteristics of Chronic Poor (CP), Other Poor (OP) and Non-poor (NP)**

			<b>All India: Urban</b>			
Description of Item/ HH Characteristics			Chronic Poor	Other Poor (OP)	Non-Poor	All HH
1	Distribution of HHs by Poverty Status in various Caste groups (%)	All	11.3	11.5	77.2	100
		ST	16.2	21.7	62.1	100
		SC	18.6	16.5	64.9	100
		OBC	12.7	15.3	72.0	100
		Others	8.0	6.9	85.1	100
2	Distribution of HHs by Poverty Status in different Occupational Categories (%)	Self_employed	12.0	12.4	75.6	100
		Regular wage/ Salary Earners	6.9	6.1	87.0	100
		Casual Labour	23.7	27.1	49.2	100
		Others	10.2	8.9	80.9	100
3	Distribution of HHs by Sex of Head of HH (%)	Male	11.5	10.9	77.6	100
		Female	9.5	16.9	73.6	100
4	Distribution of HHs by Caste and Poverty Status (%)	ALL	100	100	100	100
		ST	5.9	7.7	3.3	4.1
		SC	23.4	20.5	11.9	14.2
		OBC	35.0	41.3	29.0	31.1
		Others	35.7	30.5	55.8	50.6
5	Distribution of HHs by Occupation and Poverty Status (%)	Self_employed	36.4	37.1	33.8	34.5
		Regular wage/ Salary Earners	25.3	22.2	47.0	41.7
		Casual Labour	29.4	33.0	8.9	14.0
		Others	8.9	7.7	10.3	9.8
6.	Average no. of Persons, Children and Aged per HH	HH Size	6.54	5.06	4.1	4.53
		Children	3.15	1.61	1.15	1.43
		Aged (60+)	0.33	0.32	0.28	0.29
7.	% Children (<15 yrs) to Total Persons	48.1	31.8	27.7	31.5	
8.	% of Aged (60 + yrs) to Total persons	5.06	6.29	6.77	6.43	

HH: Household

**Demographic Factors**

Data on life cycle of the household, (proxied by age of the head of the household and number of children relative to adults, percentage of persons aged more than 40 years); household members' participation in the labour market, household wage earnings, and female literacy rate are presented in Tables 3-4. Figures show the distinct characteristics of the chronic poor in terms of demographic features: average household size is large, number of children is large, percentage of persons aged above 40 years is low; and age of the head of the household is less. All these features suggest that chronic poor households tend to be at the beginning of the family life cycle. Consequently, children is the largest group among the

chronic poor groups constituting 53 per cent of the chronic poor persons in rural areas as compared to 37 per cent of the children in the rural population; and children constitute 48 per cent of the chronic poor persons in urban areas as compared to 31 per cent of children in total in the urban population.

**Table 3: Selected Household Characteristics of Chronic Poor (CP), Other Poor (OP) and Non-Poor (NP)**

		<b>All India: Rural</b>			
		CP	OP	NP	All
1.	Per Capita Expenditure (Rs.)	241	280	535	443
2.	Wage rate (Rs / Man day)	38.50	36.70	67.20	56.50
3.	Wage earnings per household (Rs/week)	320	412	602	525
4.	No. of man days per HH/week	8.32	11.23	8.95	9.28
5.	No. of workers per household	1.46	2.53	1.84	1.89
6.	Percentage of households with child labour	3.2	8.6	4.6	4.6
7.	Percentage of aged among workers	6.3	14.1	14.4	13.5
8.	Dependency ratio	3.08	1.19	1.51	1.61
9.	Average age of head of the household (years)	40.7	44.3	44.9	44.3
10.	Average size of household	6.1	5.6	4.7	5.0
11.	Average number of children	3.2	2.1	1.5	1.9
12.	Percentage of persons with more than 40 years	15.3	22.3	26.0	23.6
13.	Percentage of landless households	46.8	41.3	39.7	40.9
14.	Female literacy rate	28.2	27.1	42.6	37.5

Note:

1. Dependency ratio is the ratio of number of non-workers to workers.
2. Wage rate is estimated for the reported households. It is the ratio of total earnings of all households to the number of days worked in a week.
3. Wage earnings per household is worked out for the reported households.
4. Female literacy rate is the percentage of females aged above five years who can read and write.

Chronic poor group is distinct in terms of its participation in the labour market. Due to the presence of a larger number of children, the proportion of workers to all persons for chronic poor is very low at 24 per cent in rural areas; 21 per cent in urban areas as compared to 38 (32) per cent respectively for all rural (urban) households. It is worth noting, the wage rate does not differ between chronic poor and other poor but wage earnings per household is significantly lower for chronic poor. Low wage earnings per household among chronic poor households can be attributed to their less number of days employed per household. Other striking feature of chronic poor households is their higher dependency ratio.

## **Other Poor**

Who are the other poor? How have they escaped chronic poverty? The characteristics that distinguish other poor from chronic poor are (i) marginally higher per capita expenditure; (ii) higher levels of participation in the labour market; (iii) substantially lower dependency ratio and (iv) higher incidence of child labour. Though the wage rate is low as in the case of chronic poor, the other poor could overcome this disadvantage to some extent by their higher rate of participation in the labour market. It is worth observing that the incidence of child labour is high for other poor.

Why 'other poor' could not cross the poverty line? Comparison of the figures of other poor with those of non-poor given in Tables 3 and 4 would provide some clues. Higher dependency on casual labour market for livelihood, and lower wage rates underlie their lower level of living compared to non-poor. Even more intensive use of labour could not lift them above the poverty line; nevertheless they could escape chronic poverty. Chronic poor when they move from lower end of family life cycle as children become earners over time, they are more likely to move into other poor group rather than non-poor group.

## **Inter State Variations**

Appendix Tables A3 and A4 show that the incidence of chronic poverty varies substantially across states and more or less follow the levels of their development with a few outliers. The incidence of chronic poverty is high in Orissa (28 per cent in rural and 26 per cent in urban), Uttar Pradesh (21, 18), Madhya Pradesh (19, 25), West Bengal (19, 6) and Bihar (19, 19) and low in the Jammu and Kashmir (2.7, 5.6), Punjab (4.8, 3.2). The four less developed states viz. Bihar, Orissa, Madhya Pradesh and Uttar Pradesh together account for 61 per cent of the chronic poor in rural areas. Among the developed states, Maharashtra and among the middle income state, West Bengal are the outliers. Given their level of development they carry higher burden of chronic poor. It is also striking, Rajasthan, one of the less developed states has very low incidence of chronic poor in rural area. Explanation for the poor performance of Maharashtra and West Bengal and better performance of Rajasthan in rural areas merit further research.

**Table 4: Selected Households Characteristics of Chronic Poor, Other Poor and Non-Poor**

All India: Urban					
		Chronic Poor	Other Poor	Non-Poor	All
1.	Per Capita Expenditure (Rs/month)	328	387	930	762
2.	Wage rate (Rs / man day)	73.0	54.6	171.1	142.4
3.	Wage earnings per household (Rs/week)	570	622	1426	1234
4.	Number of man days per HH per week	8.3	13.5	8.8	9.3
5.	No. of workers per household	1.4	2.2	1.4	1.5
6.	Percentage of households with child labour	1.7	6.8	1.2	1.9
7.	Dependency Ratio	4.1	1.9	2.3	2.4
8.	Average size of household	6.5	5.1	4.2	4.5
9.	Average number of children	3.15	1.61	1.15	1.43
10.	Average age of head of the household	41.3	43.7	42.9	42.8
11.	Percentage of aged among workers	4.2	12.2	6.6	6.9
12.	Female literacy rate	56.1	51.1	74.2	68.6

There are substantial inter-state variations in the relative sizes of occupational groups. In rural areas, the agricultural labour together with the non-agricultural labour account for as high as 73 per cent in Punjab and close to 60 per cent in Gujarat, Haryana and Tamil Nadu in comparison to 53 per cent in All India.

To what extent the State Domestic Product (SDP) per capita can account for the inter-state variations in the incidence of CP? Regressing the incidence of chronic poverty (CP) on SDP per capita (SDPPC) and Government Expenditure on Social Services (GES) per capita (GESPC), we obtain

$$\text{Rural: } \ln CP = 16.60 - 1.22^* \ln SDPPC - 0.36 \ln GESPC$$

$$(t) \quad (2.87) \quad (-2.68) \quad (-0.79)$$

$$R^2 = 0.28$$

$$\text{Urban: } \ln CP = 9.79 - 0.89^+ \ln SDPPC - 0.20 \ln GESPC$$

$$(t) \quad (1.62) \quad (-1.89) \quad (0.42)$$

$$R^2 = 0.13$$

\* : Significant at 5% ;    + : Significant at 10%

The coefficient of State Domestic Product per capita (proxy for per capita income) is significant at 5 per cent in rural areas and at 10 per cent in urban areas. The coefficients of

Government Expenditure on Social Services is not significant in both rural and urban areas. Re-estimating the equation after excluding GESPC has turned the coefficient of SDPPC insignificant at 5 per cent. The results suggest that these variables do not explain satisfactorily the interstate variations in the incidence of CP. Perhaps, one may have to experiment with demographic and social variables. Adding monthly per capita expenditure (MPCE) to the regression, we obtain

$$\text{Rural: Ln CP} = 20.38 - 2.26^* \text{ Ln MPCE} - 0.22 \text{ Ln SDPPC} - 0.27 \text{ Ln GESPC}$$

$$(t) \quad (2.40) \quad (-2.53) \quad (-0.39) \quad (-0.69)$$

$$\overline{R^2} = 0.50$$

$$\text{Urban: Ln CP} = 24.74 - 4.93 \text{ Ln MPCE} + 0.97 \text{ Ln SDPPC} + 0.14 \text{ Ln GESPC}$$

$$(t) \quad (2.46) \quad (-1.97) \quad (0.95) \quad (0.31)$$

$$\overline{R^2} = 0.13$$

\* Significant at 5 per cent

Number of observations = 16

The inclusion of household per capita expenditure into the regression has turned the coefficient of SDP insignificant. Thus, once we control for per capita expenditure, there is no significant influence of SDP per capita on chronic poverty. This does not imply that a states' economic growth is not important; rather it may imply that its influence operates through household per capita expenditure. There may be other channels connecting SDP with chronic poverty. We have not analysed it further. Moreover, since separate figures are not available for rural and urban areas, we have used in the regression, rural and urban combined figures for SDP and GES. Another limitation is that SDP originates in a state is not the same as the income accruing to the state. For our analysis, the latter variable is of greater relevance<sup>6</sup>. Even if relevant data are available, per capita expenditure can be considered as a proximate immediate determinant and state income and public spending on social services as basic determinants<sup>7</sup>. Even with the inclusion of household per capita expenditure, much of the

<sup>6</sup> In some states like Kerala remittances from expatriates is substantial.

<sup>7</sup> Public provision of health and education services influences the level and composition of household expenditure.

inter-state variation in the incidence of chronic poverty remains unexplained. As will be seen in our logit regression results, social and demographic variables are also correlated with chronic poverty. Noting these caveats, we interpret the regression results.

The coefficient of MPCE is significant and negative for rural areas and not significant for urban areas. The results imply that a one per cent increase in MPCE would reduce the incidence of chronic poverty by 2.26 per cent. Simple calculations would show that to reduce the incidence of rural chronic poverty from 13.6 per cent (the incidence in rural India) to 5 per cent (the incidence in states such as Andhra Pradesh, Punjab etc.) would require 28 per cent increase of MPCE.

### **Chronic Poverty Among Labour Households**

We have noted that agricultural labour households in rural areas and casual labour households in urban areas have the highest incidence of chronic poverty and are the major sub-groups of chronic poverty in terms of relative size. Table 5 provides the demographic and other characteristics of the above two sub-groups further classified by poverty groups (CP, OP, NP). Several things are worth noting.

The patterns across poverty groups (CP, OP, NP) are more or less similar for agricultural and casual labour groups. The levels of living as reflected in per capita expenditure are low for chronic poor, slightly better for other poor and high for non-poor. The human capital proxied by female literacy is low for chronic poor and improves as one moves from chronic poor to non-poor. The number of workers per household and the number of days of employment per week are low for chronic poor households. Size of household, dependency ratio and number of children are more among chronic poor households. These factors contribute to their low level of living. The other poor sub-group could achieve



**Table 5 : Profiles of Rural Agricultural Labour and Urban Casual Labour Households**

	Agricultural Labour Households				Casual Labour Households			
	Rural				Urban			
	CP	OP	NP	All	CP	OP	NP	All
Per capita expenditure Rs./month	231	276	469	379	302	374	664	465
Average household size	5.9	5.2	4.1	4.7	6.3	4.7	3.7	4.6
Dependency ratio	2.6	1.1	1.0	1.3	3.7	1.4	1.7	2.0
Wage rate (Rs. man day)	34.0	33.7	39.7	37.2	52.3	47.5	74.0	60.4
Wage earnings per household (Rs./week)	297	406	397	380	435	561	653	582
No. of man days per household per week	9.3	13.7	11.0	11.3	8.3	12.7	9.1	9.9
Average no. of workers per household	1.6	2.3	1.9	1.9	1.4	2.2	1.5	1.7
Households with child labour (%)	3.3	8.5	4.4	5.2	1.8	7.1	1.9	3.2
Households with aged Labour (%)	4.9	10.8	10.4	9.5	3.1	9.0	7.0	6.7
Female literacy HHs (%)	24.0	23.0	31.0	27.0	47.0	41.7	51.2	47.2
Distribution of HHs with in each poverty category (%)	18.9	23.3	57.9	100.0	23.7	27.1	49.2	100.0
Percentage distribution of households by social group								
ST	13.1	21.2	10.7	13.6	8.9	10.7	5.0	7.5
SC	43.8	30.3	34.5	35.3	30.0	27.8	25.0	26.9
OBC	27.7	31.9	36.0	33.5	33.4	40.2	40.4	38.7
Others	15.4	16.6	18.8	17.6	27.7	21.3	28.6	26.9
All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

higher per capita expenditure compared to chronic poor sub-group by employing more intensively their labour, including child labour. The advantageous position of the non poor group among agricultural and casual labour is due to their higher wage rate and small household size. The factors underlying their higher wage rate require further research.

As in the case of chronic poor, scheduled caste households have the highest levels of chronic poverty among all rural/urban households. The core chronic poverty groups among labour households are schedule caste, in both rural and urban areas; and in addition other backward caste in urban areas.

Comparison between rural agricultural labour and urban casual labour households is instructive. Chronic poverty levels are higher among urban casual labour even though they have higher levels of per capita expenditure and higher levels of human capital proxied by

female literacy. The three categories of rural agricultural labour households (CP, OP, NP) exhibit higher levels of labour force participation than their corresponding categories among urban casual labour; this is reflected in more days of employment per week, more number of workers, lower dependency rate and higher incidence of child labour etc. Despite more intensive use of labour, the per capita expenditure is low for rural agricultural labour because of their low wage rate; agricultural wage rate is lower 40 percent than the urban casual labour wage rate. How might the higher incidence of chronic poverty among casual labour households be reconciled with their higher per capita expenditure levels? What factors underlie the intra and inter group variations in wage rate? Answers to these questions need further research.

### **Logistic Regression Analysis**

In this section, we validate some of the inferences drawn from sub group comparisons. Logit models have been estimated for four categories of households data: all rural households, all urban households, agricultural labour households and casual labour households. We analyse the effects of demographic, economic and social factors on chronic poverty.

The dependent variable of the logit model assumes one if a household is a chronic poor household and zero otherwise. The common set of explanatory variables included in the logistic regression analysis include monthly per capita (per person) consumption expenditure of the household (MPCE), household size, dependency ratio, number of workers in the household, presence of child labour, presence of aged labour (aged more than 60 years), underemployed household (household with at least one worker employed less than 5.5 days during the reference week), social group of the household, and dummy variables to capture state-specific effects. The parameter estimates of the Logit model are provided in Appendix Tables A5 – A8 using SPSS package with forward method. The estimated Logit models give good fit to the data from a statistical perspective: the  $\chi^2$  value is significant. Nagelkerke  $R^2$  value is greater than 0.80 and the percentage of correctly predicted cases is greater than 90.

Logit regression estimates of the incidence of CP in rural areas, given in Table A5, show that all the coefficients with the exception of the coefficient of Kerala dummy variable are statistically significant and are all signed more or less according to expectations. In the

case of logit model estimated for all urban household data, all the coefficients except those of OBC dummy variable and state specific dummy variables of Bihar and Karnataka are significant and possess correct signs. The effects of the chosen explanatory factors on chronic poverty are strikingly similar for rural and urban areas. The results show that the probability of a household falling into chronic poverty both in rural and urban areas decreases as household income (total expenditure) increases. The estimated coefficients of MPCE in absolute terms is larger for rural areas. The results also show that the risk of chronic poverty decreases with an increase in the number of workers in a household and increases with household size, non-worker to worker ratio, and with the presence of child as well as aged labour. As expected for rural households, ownership of land reduces the probability of a household falling into chronic poverty. The results also show that the probability of a household falling into chronic poverty in both rural and urban areas decreases with the presence of a underemployed worker in the household. This result is tune with that of 'unemployment' variable in urban model. The coefficients of state dummy variables are positive and large for Haryana, Himachal Pradesh, Jammu Kashmir, Maharashtra, Uttar Pradesh and West Bengal in rural areas and for Kerala, Maharashtra, Orissa, Punjab, Tamil Nadu and Uttar Pradesh in urban areas. These results imply that after controlling for other factors, the above states have higher incidence of chronic poverty. Some of the states like Punjab and Maharashtra are developed states. In these states, the incidence of chronic poverty would have been lower but for the negative effect of state specific factors on the well being of chronic poor.

As in the case of all rural/urban households, per capita expenditure, number of workers and land ownership of agricultural labour households reduce the risk of chronic poverty among labour households; and dependency ratio and presence of child labour increase the risk of chronic poverty. Female illiterate households among casual labour are associated with higher risk of chronic poverty in urban areas. It is striking that SC and OBC groups among rural agricultural labour households in rural areas and ST, SC and OBC among urban casual labour are associated with higher risk of chronic poverty. As in the case of all households, the households with an under employed worker have higher probability of falling into chronic poverty. In contrast to the results of all households, the probability of a household falling into chronic poverty decreases with household size.

What is the impact of income on chronic poverty?

We have observed from our comparative analysis as well as Logistic regression analysis, negative relationship between household expenditure (proxy for income) and incidence of chronic poverty. What is the impact of a 10 per cent increase in per capita expenditure on probability of a household falling into chronic poverty? What is its effect on the incidence of chronic poverty? We have computed for each sample household the effect of a 10 percent increase in per capita expenditure on probability. The households effects are arranged to obtain group averages of the effect of 10 per cent increase in income on probability. It has been seen that a probability of a chronic poor household falling into chronic poverty decreases by 0.02 points for chronic poor in rural areas and by 0.05 points in urban areas. The impact of the change in probability on the mobility of household across sub- groups is shown in Table 6.

**Table 6: Households Movement Across Poverty Groups Due to a 10% increase in MPCE.**

Poverty Groups	Rural				Urban			
	Base	CP	OP	NP	Base	CP	OP	NP
Chronic Poor	100	68	16	16	100	71	15	14
Other poor	100		59	41	100		68	32

Note: First row shows the distribution of chronic poor households across the groups after 10 per cent increase in the MPCE.

It can be seen that in rural areas 68 per cent of the chronic poor remain to be chronic poor, 32 per cent move out of chronic poverty – 16 per cent moving into other poor and 16 per cent cross the poverty line and move into non-poor group. In urban areas, after 10 percent increase in MPCE of each household, 71 per cent remain to be chronic poor, 29 per cent move out of chronic poverty – 15 per cent into other poor group and 14 per cent into non-poor group. In the case of other poor, a 10 percent increase in each household expenditure would result in 41 percent of them to move out of poverty in rural areas and 32 per cent in urban areas. The effect of income / expenditure increase on chronic poor is more or less same in both rural and urban areas. While on other poor the impact would be more in rural areas. Simple calculation would show the elasticity of incidence of chronic poverty with respect to MPCE works out to be -3.2 per cent for rural households and – 2.9 per cent for urban households. These are very approximate estimates.

## **Concluding Remarks**

We have examined the determinants of chronic poverty in India. Our main conclusions are as follows. Demographic pressure, low wage rate for households offering labour in rural and urban areas, low household income, and social factors have significant impact on chronic poverty. The probability of a household falling into chronic poverty increases with household size, number of children per household, dependency ratio; and decreases with household expenditure and number of days of work put in by a household. Agricultural labour in rural areas and casual labour and self employed households in urban areas among the occupational groups and scheduled caste households both in rural and urban areas among the social groups are the core chronic poor groups.

Our results suggest that the chronic poor households tend to concentrate at the lower end of family life cycle. The other poor households could move out of chronic poverty because of their small household size, and by more intensive use of their labour including child labour. While, wage rate of the labour household do not differ between chronic and other poor households, it is substantially higher for non-poor households. Hence, higher wage rate is of crucial importance for lifting labour households from poverty. Further research is needed for understanding the factors underlying the wage rate differences.

Our results demonstrate the crucial importance of household income for reducing the incidence of both chronic poverty and other poverty. This study provides a range of estimates for the elasticity of incidence of chronic poverty with respect to income. The elasticity estimate from inter-state regression is  $-2.4$  for rural households. However, the estimates computed from Logit model places it at  $-3.2$  for rural and  $-2.9$  for urban households.

We have shown that a 10 per cent increase in the per capita expenditure of chronic poor households would lift about one third of them from chronic poverty and one sixth of them from poverty. Roughly, 60 per cent increase in per capita expenditure is required to lift all of the chronic poor households from poverty. This would be a stupendous task considering the fact that in the 1990s per capita expenditure of the bottom 30 per cent increased at 1.5 per cent per annum.

We suggest that measures such as income transfers to the poor are not sufficient to reduce chronic poverty. Demographic pressure<sup>8</sup>, low wage rates, landlessness, social factors are clearly shown to be important factors that need to be addressed. Improving the access to land for the deprived groups by providing credit to them for the purchase and development of land, enforcement of minimum wage legislation, provision of employment in the slack season in the rural areas through the present National Rural Employment Guarantee Programme would reduce the incidence of chronic poverty. Also, a balanced package of measures to improve the health and educational status of the poor households, pro-poor growth policies for generation of productive employment and social policies to empower deprived groups, are needed to eliminate chronic poverty. It is by now well recognized that improving the health / nutritional status and educational levels is not only an end in itself but also an instrument for higher economic growth.

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<sup>8</sup> There is empirical evidence to show that female education would reduce demographic pressure by reducing fertility and infant mortality rates (Subbarao and Raney, 1995).

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**Appendix Table A1: Logit Models Estimated for Rural and Urban Households Data**

Dependent Variable : CP

	Rural		Urban	
	$\hat{\beta}$	S.E.	$\hat{\beta}$	S.E.
Standard of Living Index (SLI)	-0.2521	0.0052	-0.221	0.009
HH size	-0.0138 <sup>+</sup>	0.0088	0.027 <sup>+</sup>	0.018
Dependency Ratio	0.2423	0.0747	0.604	0.158
% Male literates	0.0007 <sup>+</sup>	0.0007	0.003	0.002
% Female literates	-0.0008 <sup>+</sup>	0.0008	-0.002 <sup>+</sup>	0.002
Caste (Ref: Others)				
SC	0.1836	0.0646	0.282 <sup>+</sup>	0.132
ST	-0.0831 <sup>+</sup>	0.0752	-0.075 <sup>+</sup>	0.198
OBC	0.0490 <sup>+</sup>	0.0650	0.016 <sup>+</sup>	0.131
States (Ref: Andhra Pradesh)				
Assam	1.1000	0.1895	-1.575	0.557
Bihar	1.3380	0.1617	0.501 <sup>+</sup>	0.341
Gujarat	0.7930	0.2066	0.246 <sup>+</sup>	0.349
Haryana	1.3613	0.2208	1.055	0.391
Himachal Pradesh	1.4165	0.2642	-0.232 <sup>+</sup>	0.687
Jammu & Kashmir	0.8028	0.2603	-0.481 <sup>+</sup>	0.664
Karnataka	1.2422	0.1899	0.774	0.326
Kerala	0.5810	0.2785	0.593 <sup>+</sup>	0.448
Madhya Pradesh	2.1225	0.1647	1.414	0.299
Maharashtra	1.8269	0.1809	1.277	0.292
Orissa	1.4118	0.1716	0.731	0.332
Punjab	1.8354	0.2468	1.495	0.490
Rajasthan	1.5675	0.1702	1.264	0.312
Tamil Nadu	0.6226	0.1878	0.103 <sup>+</sup>	0.308
Uttar Pradesh	2.3471	0.1646	1.645	0.309
West Bengal	1.1002	0.1827	-0.268 <sup>+</sup>	0.345
Other States and Union Territories	0.3875	0.1753	-0.803	0.318
Constant	0.5634	0.1818	1.190	0.341
Nagelkerke R <sup>2</sup>	0.476		0.489	
$\chi^2$ value	9361**		2807**	
Number of Observations	17609		6335	

<sup>+</sup> Not significant at 5% level. Other estimated coefficients are significant.

\*\* Significant at 1% level



**Appendix Table 2: Estimated log-linear Regression Model – Rural and Urban Areas**

Dependent Variable : Ln (SLI)

	Rural		Urban	
	Coef.	t - Value	Coef.	t - Value
Ln (MPCE)	0.883	55.46 **	0.767	31.180 **
State Dummies (Ref: Andhra Pradesh)				
Assam	-0.099	1.89 *	-0.058	0.72
Bihar	0.001	0.01	0.089	1.11 *
Gujarat	0.028	0.54	0.014	0.17
Haryana	0.280	5.37 **	0.200	2.49 **
Himchal Pradesh	0.078	1.49	-0.030	0.38
Jammu & Kashmir	0.186	3.56 **	0.062	0.76
Karnataka	-0.041	0.79	-0.043	0.54
Kerala	0.164	3.15 **	-0.013	0.17
Madhya Pradesh	0.243	4.67 **	0.140	1.74 *
Maharashtra	-0.150	2.87 **	-0.020	0.250
Orissa	0.000	0.00	-0.024	0.300
Punjab	0.467	8.97 **	0.339	4.220 **
Rajasthan	0.142	2.73 **	0.092	1.150
Tamil Nadu	-0.134	2.57 *	-0.147	1.830 *
Uttar Pradesh	0.188	3.60 **	0.198	2.470 *
West Bengal	-0.177	3.41 **	-0.052	0.650
Other States and UTs	-0.190	3.63 **	-0.141	1.740 *
Constant	-3.069	27.91 **	-1.870	11.020 **
Adj R <sup>2</sup>	0.954		0.858	
Number of observations	180		180	

Note: MPCE: Monthly Per capita Consumption Expenditure (Rs./month)

SLI: Standard of Living Index

\*\* Significant at 1% level

\* Significant at 5 % level

**Appendix Table A3: Incidence of Chronic Poverty (%) by Social and Occupation Categories of the Households- State-wise.**

**(Rural)**

S. No.	State	Social Group (Caste)				Type of HH (Occupation)					Incidence of CP (All HHs)	State-wise Distribution of CP (%)
		ST	SC	OBC	Others	Artisan	Ag. Lab	Non-Ag.L	Cultivator	Others		
1	Andhra Pradesh	5.6	7.5	4.4	2.7	3.3	5.5	7.5	2.1	8.0	4.8	9.3
2	Assam	14.1	15.2	14.9	18.3	20.1	21.0	21.1	14.2	8.7	16.6	2.7
3	Bihar	11.6	25.4	18.6	13.4	19.7	21.2	23.1	11.6	25.2	18.6	10.9
4	Gujarat	4.6	6.1	4.9	1.5	1.8	6.2	5.6	1.0	4.8	3.8	4.3
5	Haryana	13.3	20.7	5.8	1.7	7.9	23.0	12.2	0.3	5.0	7.8	1.8
6	Himachal Pradesh	2.0	10.3	2.8	4.6	8.7	3.8	10.9	4.5	2.4	5.6	0.8
7	Jammu & Kashmir	0.5	4.0	-	1.6	-	1.1	0.8	2.4	0.8	1.6	0.7
8	Karnataka	8.2	14.5	5.3	4.3	6.4	10.3	6.4	4.1	5.6	7.2	5.2
9	Kerala	-	3.6	3.4	1.8	2.3	3.3	2.7	2.0	3.2	2.7	3.2
10	Madhya Pradesh	20.0	29.7	17.3	9.7	16.4	27.8	35.6	11.1	16.1	19.2	8.2
11	Maharashtra	16.9	23.6	12.6	7.6	10.7	20.2	8.8	6.8	7.8	13.0	8.5
12	Orissa	28.8	35.7	26.0	20.2	26.2	33.2	24.9	24.2	19.0	27.6	4.6
13	Punjab	-	9.1	2.6	1.0	4.3	11.4	6.6	0.7	2.0	4.8	2.0
14	Rajasthan	2.3	7.4	3.0	1.8	2.6	6.1	5.6	2.2	4.2	3.3	4.7
15	Tamil Nadu	4.2	17.7	6.1	4.0	5.2	12.1	8.9	5.3	11.6	9.6	6.8
16	Uttar Pradesh	17.9	31.4	18.8	14.2	23.0	35.1	30.8	14.2	17.5	20.9	16.4
17	West Bengal	16.3	21.1	12.0	19.1	18.3	23.0	16.3	17.5	12.6	19.1	8.2
18	Other States & Uts	2.4	0.7	0.3	0.1	0.1	1.8	0.3	1.6	0.7	0.9	1.8
All India		14.0	20.9	12.0	9.9	13.2	18.9	13.6	9.3	11.6	13.6	100.0

**Appendix Table A4: Incidence of Chronic Poverty (%) by Social and Occupation Category of the Households- State-wise (Urban)**

S.No.	State	Social Group (Caste)				Type of HH (Occupation)				Incidence of CP (All HHs)	State-wise Distribution of CP (%)
		ST	SC	OBC	Others	Self_Empl.	Regular Wage/Salary	Casual Labour	Others		
1	Andhra Pradesh	2.3	13.5	7.4	7.1	7.7	6.3	13.1	5.3	7.9	6.9
2	Assam	0.3	3.0	0.9	1.8	3.6	-	5.5	0.5	1.8	0.2
3	Bihar	23.6	24.7	21.9	12.1	26.7	8.2	36.8	10.5	18.9	7.6
4	Gujarat	3.8	9.2	4.4	3.1	3.1	3.6	8.1	1.4	4.1	2.2
5	Haryana	-	18.9	6.5	0.8	4.8	1.9	16.3	28.6	7.0	1.3
6	Himachal Pradesh	-	6.7	5.4	0.4	0.5	1.5	11.8	0.3	1.5	-
7	Jammu & Kashmir	-	1.2	-	0.6	-	-	3.0	2.9	0.6	-
8	Karnataka	15.7	22.3	10.7	7.5	10.5	6.9	19.6	11.3	10.5	5.5
9	Kerala	-	4.9	5.8	5.5	5.3	3.2	8.7	5.8	5.6	1.6
10	Madhya Pradesh	31.7	40.6	27.8	16.7	23.9	18.1	47.7	19.1	25.1	14.5
11	Maharashtra	15.7	21.9	15.1	11.0	12.9	8.1	40.6	12.4	13.4	17.5
12	Orissa	29.5	34.9	28.9	20.4	30.8	14.1	42.5	27.3	26.0	5.9
13	Punjab	-	6.7	1.3	1.9	2.6	2.5	9.0	0.6	3.2	0.9
14	Rajasthan	6.8	20.3	12.4	8.1	13.8	8.4	19.9	3.6	11.5	4.0
15	Tamil Nadu	17.2	20.6	8.1	2.2	7.5	5.1	17.8	11.3	8.7	7.8
16	Uttar Pradesh	17.3	23.3	22.2	13.9	18.3	11.0	43.3	16.5	18.1	19.9
17	West Bengal	6.1	12.1	5.3	4.0	6.9	2.8	13.7	4.3	5.7	3.7
18	Other States & Uts	0.4	4.0	1.0	0.7	1.8	0.5	2.4	2.0	1.2	0.6
All India		16.2	18.6	12.7	8.0	12.0	6.9	23.7	8.9	11.3	100.0

**Appendix Table A5: Logit Model estimated for All Rural Household Data**

Dependent Variable : CP

S.No.	Variable	$\hat{\beta}$	S.E.
1	Constant	10.45	0.275
2	MPCE	-0.057	0.001
3	Land Ownership Status	-0.167	0.053
4	Household Size	0.093	0.014
5	Dependency Ratio	0.958	0.020
6	No. of Workers	-0.775	0.037
7	Child Labour HH	0.273	0.125
8	Aged Labour HH	0.273	0.088
9	Under Employed HH	-0.643	0.064
10	Caste (Ref: Others)		
	ST	-0.925	0.090
	SC	1.405	0.073
	OBC	0.416	0.070
11	State (Ref: Andhra Pradesh)		
	Assam	2.724	0.155
	Bihar	0.660	0.134
	Gujarat	1.171	0.229
	Haryana	3.380	0.293
	Himachal Pradesh	5.222	0.246
	Jammu & Kashmir	2.917	0.422
	Karnataka	1.076	0.191
	Kerala	-0.051	0.272
	Madhya Pradesh	2.380	0.142
	Maharashtra	2.926	0.156
	Orissa	2.584	0.144
	Punjab	2.313	0.261
	Rajasthan	0.745	0.223
	Tamil Nadu	0.835	0.159
	Uttar Pradesh	3.201	0.139
	West Bengal	3.301	0.151
	Other States and Union Territories	-3.904	0.259
12	Negelkerke R <sup>2</sup>		0.828
13	$\chi^2$ value		38610**
14	Correctly Classified (%)		97.1
15	Number of Observations		71417

Note : Land Ownership Status : 0 if landless; 1 Otherwise  
 Child Labour HH : 0 if no CL is present ; 1 Otherwise  
 Aged Labour HH : 0 if no aged (60 years +) worker is present; 1 Otherwise  
 Under-employed HH : 0 if all workers are employed 5.5 days or more in a reference week.  
 Casual Labour HH : 0 if household has no casual labour; 1 Otherwise  
 \*\* Significant at 1% level.  
 All coefficients are significant at 5% level.

**Appendix Table A6: Logit Model Estimated for All Urban Household Data**

Dependent: CP

S.No.	Variable			
		$\hat{\beta}$	S.E.	Sig. Level
1	Constant	3.323	0.382	
2	MPCE	-0.032	0.001	
3	Household size	0.409	0.022	
4	Dependency Ratio	0.765	0.027	
5	No. of Workers	-1.239	0.062	
6	Casual Labour HH	-0.241	0.086	
7	Self Employed HH	-0.254	0.076	
8	Child Labour HH	0.540	0.197	
9	Aged Labour HH	0.471	0.135	
10	Under employed HH	0.621	0.092	
11	Unemployment	0.297	0.087	
12	Caste (Ref: Others)			
	ST	-0.768	0.152	
	SC	0.622	0.088	
	OBC	0.018 <sup>+</sup>	0.077	0.811
13	State (Ref.: A.P)			
	Assam	3.426 <sup>+</sup>	0.235	
	Bihar	0.488 <sup>+</sup>	0.471	0.300
	Gujarat	2.643	0.234	
	Haryana	3.647	0.264	
	Himachal Pradesh	3.164	0.392	
	Jammu & Kashmir	2.120	0.545	
	Karnataka	0.663 <sup>+</sup>	0.631	0.293
	Kerala	5.778	0.251	
	Madhya Pradesh	2.855	0.276	
	Maharashtra	5.465	0.236	
	Orissa	6.270	0.243	
	Punjab	5.446	0.266	
	Rajasthan	1.441	0.326	
	Tamil Nadu	5.029	0.260	
	Uttar Pradesh	4.579	0.242	
	West Bengal	3.814	0.224	
	Other States and Union Territories	2.945	0.247	
14	Negelkerke R <sup>2</sup>	0.83		
15	$\chi^2$ – Value	24125 **		
16	Correctly Classified (%)	96.6		
	Number of Observations	49161		

Note: Child Labour HH : 0 if no CL is present ; 1 Otherwise  
Aged Labour HH : 0 if no aged (60 + years) worker is present; 1 Otherwise  
Under-employed HH : 0 if all workers are under employed 5.5 days during the reference week.:  
0 Otherwise.  
Unemployment : 0 if no member of the HH is seeking and available for work; 1 Otherwise.  
Casual Labour HH : 0 if household has no casual labour; 1 Otherwise  
\*\* : Significant at 1 % level.  
<sup>+</sup> Not significant at 5% level. All other coefficients are significant at 5% level.

**Appendix Table A7: Logistic Regression Model with Labour Market related Variables – Rural**

**(Agricultural Labour Households)**

Dependent Variable : CP

S.No.	Variable	$\hat{\beta}$	S.E.
1	Constant	15.0	0.571
2	MPCE	-0.090	0.002
3	Family Size	-0.118	0.033
4	Dependency Ratio	2.471	0.076
5	No. of Worker	-0.380	0.069
6	Child Labour HH	0.548	0.231
7	Under employed HH	0.273	0.117
8	Caste (Ref: Other)		
	ST	-1.397	0.193
	SC	2.261	0.169
	OBC	0.732	0.167
9	State (Ref.: A.P)		
	Assam	2.522	0.337
	Bihar	-0.468	0.247
	Gujarat	0.658	0.412
	Haryana	3.729	0.569
	Himachal Pradesh	7.321	1.071
	Jammu & Kashmir	2.250	1.268
	Karnataka	1.461	0.325
	Kerala	-1.586	0.658
	Madhya Pradesh	3.779	0.267
	Maharashtra	4.320	0.283
	Orissa	3.227	0.267
	Punjab	2.388	0.456
	Rajasthan	-0.279	0.747
	Tamil Nadu	0.881	0.274
	Uttar Pradesh	4.493	0.279
	West Bengal	4.042	0.289
	Other States and Union Territories	-11.02	0.895
10	Nagelkerke $R^2$		0.89
11	$\chi^2$ - Value		12536**
12	Correctly Classified (%)		97.1
13	Number of Observations		18074

Note : Land Status : 0 if landless; 1 Otherwise  
 Child Labour HH : 0 if no CL is present ; 1 Otherwise  
 Aged Labour HH : 0 if no aged (60 + yrs) worker is present; 0 Otherwise  
 Under-employed HH : 0 if no one worker/member is under employed; 1 Otherwise.  
 Casual Labour HH : 0 if household has no casual labour; 1 Otherwise  
 \*\* Significant at 1% level.  
 All coefficients are statistically significant at 5%.

**Appendix Table A8: Logit Model Estimated for Urban Casual Labour Household Data**

S.No.	Variable	$\hat{\beta}$	S.E.
1	Constant	-0.881 <sup>+</sup>	0.743
2	MPCE	-0.042	0.002
3	Household Size	0.322	0.054
4	Dependency Ratio	2.41	0.126
5	Female illiterate HH	0.509	0.175
6	No. of Workers	-0.703	0.137
7	Caste (Ref.: Others)		
	ST	-0.757	0.325
	SC	-0.853	0.218
	OBC	-0.347 <sup>+</sup>	0.216
8	State (Ref.: A.P)		
	Assam	6.189	0.673
	Bihar	0.372 <sup>+</sup>	1.374
	Gujarat	6.234	6.688
	Haryana	6.686	6.708
	Himachal Pradesh	6.078	0.879
	Jammu & Kashmir	4.622	1.214
	Karnataka	2.859	1.443
	Kerala	9.901	0.747
	Madhya Pradesh	4.565	0.689
	Maharashtra	9.613	0.724
	Orissa	10.051	0.733
	Punjab	9.206	0.768
	Rajasthan	2.172	0.826
	Tamil Nadu	8.076	0.794
	Uttar Pradesh	8.643	0.713
	West Bengal	7.256	0.680
	Other States and Union Territories	5.935	0.684
9	Nagelkerke R <sup>2</sup>	0.886	
10	$\chi^2$ - Value	5165 **	
11	Correctly Classified (%)	95.5	
	Number of Observations	6044	

Note : Child Labour HH : 0 if no CL is present ; 1 Otherwise  
Aged Labour HH : 0 if no aged (60 + yrs) worker is present; 1 Otherwise  
Casual Labour HH : 0 if household has no casual labour; 1 Otherwise  
illiterate HH : 0 if no member of a household aged above 5+ years is illiterate; 1 Otherwise  
\*\*: Significant at 1 % level  
<sup>+</sup> indicates statistical insignificant at 5% level. All other coefficients are significant at 5% level.