

Estimation and determination of chronic
poverty in India: an alternative approach

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Abstract

The chronically poor are generally identified using longitudinal household panel data on income or expenditure. The basic motivation for our approach is to overcome the absence of a nationally representative panel data in analysing chronic poverty issues. A household is identified as chronically poor if its income is below the poverty line and if its children are suffering from malnutrition for a longer period of time. Making use of a set of common variables available in two nationally representative surveys (that deal with the estimation of consumer expenditure and malnutrition), the incidence of chronic poverty is estimated among the different social groups and across the various states of India. The paper aims to improve our understanding of the determinants of chronic poverty by considering economic, demographic and social factors. It attempts to answer specific questions such as: how important is household income as a determinant of chronic poverty? What factors inhibit escape from chronic poverty? How different are the 'other poor' from the chronically poor?

Demographic pressure, low wage rates for households offering labour in rural and urban areas, low household income, and social factors all have a significant impact on chronic poverty. Chronically poor households tend to be concentrated at the lower end of family lifecycle. The 'other' poor households may be able to move out of chronic poverty because of their small household size, as well as the more intensive use of labour, including child labour. While the wage rates of labour households do not show much difference between the chronic and other poor households, they are substantially higher for non-poor households. Hence, a higher wage rate is of paramount importance in lifting labour households from poverty. Improvement in household income is crucial for reducing the incidence of both chronic poverty and other poverty. A 10 percent increase in the per capita expenditure of chronically poor households would lift about one-third of these families from chronic poverty and one-sixth of them from poverty. Roughly, a 60 percent increase in per capita expenditure would be required to lift all chronically poor households from poverty. This would be a stupendous task, considering the fact that in the 1990s per capita expenditure of the bottom 30 percent increased at 1.5 percent per annum.

Keywords: child malnutrition, chronic undernutrition, standard of living index, India, estimation, methods

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Acronyms

CP	chronically poor
GES	government expenditure on social services
GESPC	government expenditure on social services per capita
ICRISAT	International Crops Research Institute for Semi-arid Tropics
MPCE	monthly per capita expenditure
NFHS	National Family Health Surveys of India
NP	non-poor
NSS	National Sample Surveys of India
OBC	other backward castes
OP	other poor
SC	scheduled-caste people
SDP	state domestic project
SLI	standard of living index
STs	scheduled tribes
UTs	union territories

1. Introduction

Chronic poverty (CP) has emerged as a major development concern in the developing countries.¹ The estimates of the prevalence of chronic poverty vary between 300 and 422 million, of which nearly half are in South Asia and one-third in India (Hulme, Moore and Shepherd 2001). Recent estimates show that the incidence of chronic poverty in India is about 13-15 percent, constituting half of the poor (Radhakrishna et al. 2006). Clearly, efforts to reduce chronic poverty in India will have a significant effect on the global scene. Recent studies in India have, to a large extent, enriched our understanding of this problem, and the measurement and identification issues have received good deal of attention in these research efforts. Since the chronically poor experience multiple deprivations over a long period, panel data are required for estimating the incidence of poverty and for identifying the CP households.

Only a few studies have analysed the incidence of chronic poverty utilizing panel data covering a number of years, as provided by the International Crops Research Institute for Semi-arid Tropics (ICRISAT) for a very few villages in the dryland areas of India (Gaiha 1989; Gaiha and Imai 2003). Other studies have been based mostly on two-period panel data (National Council for Applied Economic Research 1986; Bhide and Mehta 2006). Furthermore, these studies employ income as the measurement of chronic poverty, but it is widely recognized that income poverty provides only a simplified view of poverty and the conceptualization of poverty should extend beyond what is captured by money metric measure. Any reduction in income poverty may not, *pari passu*, provide the escape from other forms of deprivation.²

This paper conceptualizes chronic poverty by using dimensions based on income and nutrition. A household is identified as chronically poor if its income is below the poverty line, and its family members are suffering from malnutrition. There are several reasons for considering malnutrition along with income in the identification of the chronically poor. First, 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 in procuring adequate food to fulfil nutritional needs. See, for example, Bliss and Stern (1978) who investigate the link between productivity, wages and nutrition.³

Second, the malnourished children of poor families not only fail to achieve their full genetic growth potential but also are exposed to greater risk of child mortality. As adults they will be less productive, suffering from chronic illness and disability (Smith and Haddad 2000). Third, the risk of malnutrition is higher among children whose mothers suffer from chronic energy deficiency, and the link between child-adult malnutrition leads to a lifecycle of poverty within the family. Since the present nutritional status of a mother depends on her childhood nutritional status, the vicious circle of malnutrition (mother-child-mother) leads to an intergenerational transmission of poverty. Clearly, the nutrition theory of poverty explains why

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

² For instance, although a reduction in income poverty reduces malnutrition, the 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 the higher-income states (Radhakrishna et al. 2004). The incidence of underweight among the rural children is as high as 28 percent even in the top decile.

³ 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.

some households/individuals remain trapped in poverty for a longer period even when the economy achieves higher growth.

This study attempts to estimate chronic poverty among the states of India and its 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:

- i) How important is household income as a determinant of chronic poverty?
- ii) What factors inhibit the escape from chronic poverty?
- iii) How are the 'other poor' different from the chronically poor?

These questions have been addressed with a comparative analysis of the household characteristics of three groups, viz., (i) the chronically poor (CP), (ii) the other poor (OP) and (iii) the non-poor (NP). The chronically poor (CP) constitute households living below the poverty line with at least one *stunted child*; the rest of the poor households are classified as the other poor (OP), i.e., poor households without stunted child/children, and the non-poor (NP) households are those whose income exceeds the income poverty line. Some of the conclusions of the comparative analysis have been validated with a logistic regression analysis of the probability of a household belonging to chronic poverty category. Some of the issues relating to movements over time of poor households that are examined here would ideally require longitudinal data. Our inferences are subject to the same limitations as those of cross-section analysis.

2. Data and methodology

The chronically poor are generally identified with longitudinal household panel data on consumer expenditure. Our approach is motivated by the need to overcome the absence of a nationally representative panel data. The alternative methodology suggested here can be implemented using any survey data that indicate measures of income poverty and nutrition status of sample households. The existing national surveys, National Family Health Surveys (NFHS) and National Sample Surveys (NSS) are not panel surveys and are conducted only once every five years. To overcome this drawback, Radhakrishna et al. (2006) propose two alternative criteria for identifying chronically poor households: (i) those with at least one stunted child and (ii) those where the women suffer from chronic energy deficiency. Based on these criteria, the prevalence of the chronically poor in India is estimated to be 13.84 percent and 8.96 percent, respectively. In this paper, we employ the first criterion, viz. presence of at least one stunted child in the household. Since stunting reveals long-term deprivation, a poor household with a stunted child can be assumed to have been living in poverty for a longer duration.

The implementation of the above methodology requires data at the household level on expenditure per capita (for measuring poverty status) as well as anthropometric measures of children within the households (for determining child nutritional status). However, in India no nationwide survey has collected data on both variables. Therefore, Radhakrishna et al. (2004, 2006) suggest pooling the two different datasets, viz. NSS and NFHS,⁴ for estimating the incidence of chronic poverty.⁵ The percentage of poor households in each state has been estimated using NSS's monthly per capita expenditure (MPCE) data. The NFHS has collected anthropometric data on heights and weights of children (0-3 years) from all sample

⁴ NSSs on household consumption expenditure are conducted periodically in all the states and union territories of India, and these data form the basis for official estimates of poverty. The NFHS, conducted in 1998-99, was the second survey to focus on child and female health status in India.

⁵ Pooling the NSS and NFHS data does not pose a problem as the sampling design adopted in both surveys give nationally representative estimates.

households. However, it does not include the data on household consumption but collects detailed data on the household asset base. A standard of living index (SLI) has been constructed using data on these stock variables for each household.⁶ The SLI distribution has been matched with that of MPCE for each state in India to identify the SLI cut-off point that corresponds to the MPCE-based poverty line. If P is the poverty ratio corresponding to the poverty line z (MPCE), then:

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

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

The poverty line in terms of SLI corresponding to the poverty line Z is given by:

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

where, $F_{nfhs}(\cdot)$ is the cumulative distribution of the SLI.

Given the poverty line, Z, P can be estimated from (1) and substituting the estimated P in (2), poverty line in terms of SLI, 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 a 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 counted as the chronically poor. In this paper, this methodology is extended further to analyse the link between chronic poverty and labour market, by pooling the NFHS and NSS data on employment.

The NSS household survey on employment and unemployment in 1999-2000 collected detailed information on several aspects of the households' labour market participation. Both the NFHS and NSS (employment and unemployment) collect data on some common household-level variables, and we make use of these common variables to estimate a logistic regression to predict the chronic poverty status of a household 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 1 if i^{th} household is chronically poor; 0 otherwise;

CASTE_i caste group of the i^{th} household;

MLIT_i percentage of male literates in the i^{th} household;

FLIT_i percentage of female literates in the i^{th} household;

DPRATIO_i worker dependency ratio for the i^{th} household (ratio of non-workers to workers);

HHSIZE_i size of the i^{th} household;

SLI_i standard of living index of i^{th} household; and

STATED_i state specific dummy for the 17 major states in India.

Equation (3) can be estimated using the unit-level NFHS 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 dataset 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. The non-availability of SLI in the NSS data has been overcome by estimating a link equation specified as:

$$SLI_{ij} = f(\text{MPCE}_{ij}, \text{STATED}_j) \quad (4)$$

⁶ We followed the procedures of IIPS (2000) for constructing the SLI.

where SLI_{ij} is SLI of i^{th} decile of j^{th} state and $MPCE_{ij}$ is MPCE of i^{th} decile of the j^{th} state and $STATED_j$ is dummy for j^{th} state. Substituting (4) in (3), we obtain the chronic poverty function in terms of MPCE. Using this function, we can predict the probability that a NSS sample household is chronically poor.⁷ A household can be considered as chronically poor if P exceeds a specified value. We have fixed the probability for each state so that the incidence of chronic poverty, as estimated from the NSS dataset, is the same as – or closer to – the NFHS estimate.

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

3. Incidence and characteristics of poverty groups

The distribution of rural households by poverty is given in Part A of Table 1, and urban households in Part B of Table 1. The figures in row 1 show the incidence of: (i) the chronically poor (percentage of households below the poverty line with a malnourished child), (ii) the other poor (households below the poverty line without a malnourished child), and (iii) the non-poor (households above the poverty line). The figures in rows 2 – 4 indicate the incidence of poverty groups within each social (caste) group. Over all, the chronic poverty levels are sizeable; the chronically poor account for 13.6 percent of households in rural areas and 11.3 percent in the urban areas. These estimates show that the subgroup 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) and Hulme, Moore and Shepherd (2001) for all-India.

The incidence of chronic poverty also varies significantly across social and occupational groups, and is, among the social groups, highest for schedules castes (21 [19] percent in the rural [urban] areas, respectively) and lowest for others (10 [8] percent in the rural [urban] areas). The incidence among the scheduled caste is double to that of others. State-wise estimates exhibit similar patterns.

Among the occupational groups, the incidence of chronic poverty in the rural regions is most prevalent among the agricultural labour (19 percent) and lowest among cultivators (9 percent). In the urban areas it is highest among casual labour (24 percent) and lowest for regular/salary group (7 percent). These figures clearly demonstrate that households that depend on casual labour for their livelihood are exposed to a greater risk of chronic poverty. As one moves from the poverty groups to the non-poor group, the occupational composition of the households tends to shift from agricultural labour to cultivators in rural areas and from casual labour to regular/salary earners in urban areas.

⁷ We assume that equation 3 holds for all the households. In other words, any household with similar characteristics as the chronically poor households (poor household with at least one stunted 0-3 years child) would be chronically poor irrespective of whether they have a 0-3 years old child or not..

**Table 1 Household characteristics of chronically poor, other poor and non-poor
All India**

Part A – RURAL					
Description of item/HH characteristics		CP	OP	NP	All HH
Distribution of households by:					
1 Poverty status in different caste groups (%)	All	13.6	15.1	71.3	100.0
	ST	14.0	29.2	56.8	100.0
	SC	20.9	15.4	63.7	100.0
	OBC	12.0	14.4	73.6	100.0
	Others	9.9	10.5	79.6	100.0
2 Poverty status in different occupational categories (%)	Artisan	13.2	11.9	74.9	100.0
	Agricultural labour	18.9	23.3	57.8	100.0
	Non-agr. labour	13.6	14.0	72.4	100.0
	Cultivator	9.3	12.7	78.0	100.0
	Others	11.6	5.3	83.1	100.0
3 Gender of head of HH (%)	Male	13.6	15.6	70.8	100.0
	Female	13.6	11.2	75.2	100.0
4 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 Occupation and poverty status (%)	Artisan	13.0	10.6	14.0	13.4
	Agricultural labour	44.8	49.7	26.2	32.3
	Non-agr. labour	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 % of 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

Table 1 continues

Notes: Social groups: ST = scheduled-tribe people; SC= scheduled caste; OBC = other backward castes;

Poverty groups: CP = the chronically poor; OP = the other poor; NP = the non-poor; HH = households.

Table 1 (cont.)

		Part B – URBAN				
Description of item/HH characteristics		CP	OP	NP	All HH	
Distribution of households by:						
1	Poverty status in different caste groups (%)	All	11.3	11.5	77.2	100.0
		ST	16.2	21.7	62.1	100.0
		SC	18.6	16.5	64.9	100.0
		OBC	12.7	15.3	72.0	100.0
		Others	8.0	6.9	85.1	100.0
2	Poverty status in different occupational categories (%)	Self-employed	12.0	12.4	75.6	100.0
		Reg.wage/salary earners	6.9	6.1	87.0	100.0
		Casual labour	23.7	27.1	49.2	100.0
		Others	10.2	8.9	80.9	100.0
3	Gender of head of HH (%)	Male	11.5	10.9	77.6	100.0
		Female	9.5	16.9	73.6	100.0
4	Caste and poverty status (%)	ALL	100	100	100	100.0
		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	Occupation and poverty status (%)	Self-employed	36.4	37.1	33.8	34.5
		Reg. 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	% of children (<15 yrs) to total persons		48.1	31.8	27.7	31.5
8	% of aged (60+ years) to total persons		5.06	6.29	6.77	6.43

Source: Computed by authors from NSS data.

Social composition of the chronically poor differs markedly from that of all households. The scheduled caste (SC) households constitute about one-third of the rural chronically poor and nearly one-fourth of urban chronically poor – the relative size of this social group among the chronically poor is proportionally larger than its share among all households. For instance, the scheduled caste account for 23 percent of the urban chronically poor whereas 14 percent of all urban households are from this social group. It is worth mentioning that there are significant interstate variations in the relative sizes of SCs and the scheduled-tribe people

(STs) among the chronically poor households.⁸ The share of SCs among the rural chronically poor peaks at 84 percent in Punjab and 66 percent in Haryana, but is as low as 9.5 percent in Assam and 14.0 percent in Kerala, whereas in the urban areas it is 61 percent in Punjab, 58 percent in Himachal Pradesh and 50 percent in Haryana, but 5.3 percent in Kerala. The differences in the incidence of chronic poverty among the various social groups as well as their diverging share of all households determine the relative size of the social groups. This explains why the relative size of the SCs group among the chronically poor is so high (84 percent) in rural Punjab even though the incidence of chronic poverty among this group at 9.1 percent is substantially lower than that of all-India (21 percent). Truly, the higher share of the scheduled caste among the Punjab rural chronically poor is due to the higher incidence of chronic poverty among the SC households (9.1 percent) compared with the region's other social groups as well as the higher proportion of SCs in all Punjab rural households.

Fifteen percent of the rural and 11.5 percent of urban populations account for the 'other poor', i.e. who are poor but do not suffer from malnutrition; this resembles very closely the prevalence of the chronically poor. It can be broadly inferred that the poor are equally distributed between the chronically poor and other poor. It is worth observing that the incidence of chronic poverty among ST households (14.0 [16.2] percent) is less than that of SC households (20.9 [18.6] percent in rural [urban] areas). This is in striking contrast to the fact that the incidence of income poverty is higher among the STs than the SCs, an apparent paradox that is due to the higher incidence of malnutrition among SCs.

In summary, among the social groups in both rural and urban areas, the scheduled caste constitute the core chronic poverty groups. Among the occupational categories, the core groups are made up of agricultural labour in rural regions and casual labour and self-employed in urban areas. There is a good deal of overlap between the social and occupational groups. Further disaggregation of the rural cultivator group by size of landholding and by quality of land (irrigated/dry) and of the urban self-employed group would help to a better identification of the core chronic poverty groups.

4. Demographic factors

4.1 The chronically poor

Data on the lifecycle of the household (proxied by age of the household head and the number of children in relation to adults, percentage of persons aged more than 40 years); household members' participation in the labour market, household wage earnings, and female literacy households are presented in Parts A and B of Table 2. These show the distinct characteristics of the chronically poor in terms of demographic features: average household size is large, number of children is large, low percentage of persons aged above 40 years; and younger age of household head. All these characteristics suggest that chronically poor households tend to be at the initial stages of the family lifecycle. Consequently, children form the largest cluster among the chronically poor groups. In rural regions, they constitute 53 percent of chronically poor individuals versus the 37 percent for all rural children; children constitute 48 percent of the urban chronically poor compared with 31 percent of the total urban population being children

The chronically poor group is distinct in terms of its participation in the labour market. Because of the greater number of children, the proportion of workers to all persons for this group is very low: 24 percent in rural regions and 21 percent in the urban centres as compared with 38 (32) percent, respectively, for all rural (urban) households. It is worth noting that the wage rate does not differ between the chronically poor and the other poor, but that the wage earnings per household are significantly lower for the chronically poor. Low wage earnings per household among chronically poor households can be attributed to the

⁸ The state-wise estimates are not presented in this paper due to considerations of space.

shorter employment duration per household. Another striking feature of the chronically poor households is the higher dependency ratio.

Table 2 Selected household characteristics for the different poverty groups All-India

	Part A – RURAL			
	Chronically poor	Other poor	Non-poor	All
1. Per capita expenditure (Rs)	241.0	280.0	535.0	443.0
2. Wage rate (Rs/man days)	38.5	36.7	67.2	56.5
3. Wage earnings per household (Rs/week)	320.0	412.0	602.0	525.0
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 household head (yrs)	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 aged over 40 yrs	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
	Part B – URBAN			
	Chronically poor	Other poor	Non-poor	All
1. Per capita expenditure (Rs/month)	328.0	387.0	930.0	762.0
2. Wage rate (Rs/man days)	73.0	54.6	171.1	142.4
3. Wage earnings per household (Rs/week)	570.0	622.0	1426.0	1234.0
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 per household	3.15	1.61	1.15	1.43
10. Average age of household head	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

Notes: Dependency ratio is the ratio of non-workers to workers;

Wage rate is estimated for the reported households as the ratio of total earnings of all households to the number of days worked in a week;

Wage earnings per household are worked out for the reported households;

Female literacy rate is the percentage of females aged 5+ years who can read and write.

Source: Computed by authors from NSS data.

4.2 Other poor

Who are the other poor? How have they escaped chronic poverty? The characteristics that distinguish the other poor from the chronically 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. As in the case of the chronically poor, the wage rate of the other poor is low, but they may overcome this disadvantage to some extent by their higher rate participation in the labour market. It is worth observing that the incidence of child labour is high for the other poor. Though the number of children is greater in the CP households, the demand for these children in the labour market would be limited due to their poor health and nutrition status. Unless state-specific health and nutrition interventions target these vulnerable children, the chronically poor households will not automatically escape this level of poverty once their children become old enough to work. So, mere demographic structural changes cannot induce a shift from chronically poor to the other poor, or the probability of this happening is low.

Why can't the 'other poor' cross the poverty line? Comparison of the figures of the other poor with those of non-poor given in Table 2 provides some clues. Compared with the non-poor, their higher dependency on the casual labour market for a livelihood, and lower wage rates underlie the lower level of living of the other poor. Even a more intensive use of labour cannot lift them above the poverty line. Nevertheless the chronically poor may escape chronic poverty; when they move over time from the early stages of the family lifecycle, and children become earners, this group is more likely to shift into the other poor group rather than non-poor group.

5. Interstate variations

Appendix Tables A3 and A4 show that the incidence of chronic poverty varies substantially across states, following development with a few outliers. The incidence of rural/urban chronic poverty is high in Orissa (28 percent in rural and 26 percent in urban areas), Uttar Pradesh (21, 18), Madhya Pradesh (19, 25), West Bengal (19, 6) and Bihar (19, 19), but 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 percent of the rural chronically poor. Among the developed states, Maharashtra, and West Bengal among the middle-income states are the outliers. Given their level of development, they have a higher burden of chronically poor. It is also striking that Rajasthan, which is one of the less developed states, has a very low incidence of rural chronically poor. The wide divergence between the poor performance of Maharashtra and West Bengal and the better performance of rural areas in Rajasthan merits further research.

There are substantial interstate variations in the relative size of the occupational groups. In the rural regions, agricultural labour together with non-agricultural labour account for as much as 73 percent in Punjab and close to 60 percent in Gujarat, Haryana and Tamil Nadu in comparison to 53 percent for all-India.

To what extent does the per capita impact of the state domestic product (SDP) account for the interstate variations in the incidence of the chronically poor? Regressing the incidence of chronic poverty on SDP per capita (SDPPC) and government expenditure on social services (GES) per capita (GESPC), we obtain:

$$\begin{array}{l} \text{Rural:} \quad \text{Ln CP} = \quad 16.60 \quad - \quad 1.22^* \text{ Ln SDPPC} \quad - \quad 0.36 \text{ Ln GESPC} \\ \quad \quad \quad (t) \quad \quad \quad (2.87) \quad \quad (-2.68) \quad \quad \quad (-0.79) \end{array}$$

$$\bar{R}^2 = 0.28$$

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

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

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

* Significant at 5%; + Significant at 10%

The coefficient of SDP per capita (proxy for per capita income) is significant at 5 percent in rural areas and at 10 percent in urban areas. The coefficient of GES is not significant in either rural or urban areas. Re-estimating the equation after excluding GESPC has resulted in the coefficient of SDPPC being insignificant at 5 percent. The results suggest that these variables do not satisfactorily explain the interstate variations in the incidence of chronic poverty. Perhaps, one may have to experiment with demographic and social variables. Adding monthly per capita expenditure (MPCE) to the regression, we obtain:

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

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

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

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

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

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

* Significant at 5 %; + Significant at 10%; Number of observations = 16

Inclusion of the household per capita expenditure into the regression resulted in the SDP coefficient becoming insignificant. Thus, once we control for per capita expenditure, SDP per capita has no significant impact on chronic poverty. This does not imply that economic growth is not important; instead it may imply that the influence is felt through the household per capita expenditure. There may be other channels linking SDP to chronic poverty, but we have not analysed this further. Moreover, as data are not available separately for rural and urban areas, we have used combined figures in the regression for SDP and GES. Another limitation is that SDP originates within a state, and thus is not the same as the income accruing to the state. For our analysis, the latter variable is more relevant.⁹ Even if relevant data were available, per capita expenditure can be considered as an immediate determinant whereas state income and public spending on social services are considered as basic determinants.¹⁰ Even with the inclusion of household per capita expenditure, much of the interstate 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. Taking note of these caveats, we interpret the regression results.

The coefficient of MPCE is significant and negative. The results imply that a 1 percent increase in MPCE would reduce the incidence of chronic poverty by 2.26 percent. Simple calculations show that in order to reduce the incidence of rural chronic poverty in India from its current level of 13.6 percent to 5 percent (the level in states such as Andhra Pradesh, Punjab, etc.) would require a 28 percent increase in monthly per capital expenditure.

⁹ In some states like Kerala remittances from expatriates are substantial.

¹⁰ Public provision of health and education services influences the level and composition of household expenditure.

6. Chronic poverty among labour households

We have noted that the agricultural labour households in rural regions and the casual labour households in the urban centres have the highest incidence of chronic poverty and are the major subgroups of chronic poverty in terms of relative size. Table 3 provides the demographic and other characteristics of these two groups classified further by poverty

Table 3 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	231.0	276.0	469.0	379.0	302.0	374.0	664.0	465.0
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 HH (Rs/week)	297.0	406.0	397.0	380.0	435.0	561.0	653.0	582.0
No. of man days per HH per week	9.3	13.7	11.0	11.3	8.3	12.7	9.1	9.9
Average no. of workers per HH	1.6	2.3	1.9	1.9	1.4	2.2	1.5	1.7
HHs with child labour (%)	3.3	8.5	4.4	5.2	1.8	7.1	1.9	3.2
HHs 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
Share of HHs within each poverty category (%)	18.9	23.3	57.9	100.0	23.7	27.1	49.2	100.0

Notes: CP = chronically poor; OP = other poor; NP = non-poor; HH = households.

categories. Several factors are worth noting. Patterns across the poverty categories (CP, OP and non-poor) are more or less similar for agricultural and casual labour groups. The levels of living, as reflected by per capita expenditure, are low for the chronically poor, slightly better for the other poor and high for the non-poor. Human capital proxied by female literacy is low for the chronically poor and improves as one moves from the chronically poor to the non-poor. The number of workers per household and number of days of employment per week are low for the CP households. These households are disadvantaged by the size of household, dependency ratio and number of children, factors which contribute to their low level of living. Compared with the chronically poor, the other poor subgroup could achieve a higher per capita expenditure by utilizing their labour more intensively, including child labour. The advantageous position of the non-poor group among agricultural and casual labour is the result of their higher wage rate and smaller household size.

A comparison between rural agricultural labour and urban casual labour households can be instructive. Among the urban casual labour, chronic poverty levels are higher even though this group has higher levels of both per capita expenditure and of human capital, as 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, greater number of workers, lower dependency rate and higher incidence of child labour, etc. Despite the more intensive use of labour, the per capita expenditure is low for the rural agricultural labour because their wage rate is 40 percent less than that of the urban casual labour. How can the higher incidence of chronic poverty among the casual labour households be explained in

view of their higher per capita expenditure levels? What factors underlie the intra- and intergroup variations in wage rates? These questions need further research.

6.1 Logistic regression analysis

In this section, we validate some of the inferences drawn from the comparison of the subgroups. Logit models have been estimated for four categories of household data: (i) all rural households; (ii) all urban households; (iii) agricultural labour households, and (iv) casual labour households. We analyse the effects of demographic, economic and social factors on chronic poverty.

The dependent variable of the logit model assumes 1 if a household is counted as a chronically poor household and zero otherwise. The common set of explanatory variables in the logistic regression analysis includes the monthly per capita consumption expenditure of the household (MPCE), household size, dependency ratio, number of workers in the household, the presence of child labour, presence of aged labour (aged 60+ years), underemployment within the household (where at least one worker is 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 a SPSS package with a forward method. From a statistical perspective, the estimated logit models give good fit to the data: the χ^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 rural chronic poverty (Appendix Table A5) show that all the coefficients – with the exception of the Kerala dummy variable coefficient – are statistically significant and have, more or less, the expected signs. In the case of the logit model estimated for all-urban household data, all the coefficients except those of the OBC dummy variable and state-specific dummy variables for Bihar and Karnataka are significant with the correct signs. The effects of the chosen explanatory factors on chronic poverty are strikingly similar for both the rural and urban areas. The results show that the probability of a household falling into chronic poverty in either living environments decreases as household income (total expenditure) increases. The estimated coefficients of MPCE in absolute terms are larger for rural areas. The results also show that the risk of chronic poverty decreases with additional number of workers within a household and increases with household size, non-worker to worker ratio, and with the existence of a child as well as aged labour. As expected, ownership of land reduces the probability of a rural household falling into chronic poverty. It looks paradoxical that in the case of all rural households, the probability of falling into chronic poverty is negatively associated with underemployment. In contrast, chronic poverty is positively associated with underemployment in the case of all urban area households. Perhaps in rural areas underemployment levels are higher among the better-off households because the chronically poor may choose to be engaged in low-paid activities simply for survival. This result is in tune with that of the ‘unemployment’ variable in the 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 the rural regions and for Kerala, Maharashtra, Orissa, Punjab, Tamil Nadu and Uttar Pradesh in the urban areas. These results imply that after controlling for other factors, these states have a higher incidence of chronic poverty. Some of the states, such as Punjab and Maharashtra, are developed states, where the incidence of chronic poverty would have been lower, had it not been for the negative effect of state-specific factors on the wellbeing of the chronically poor.

As in the case of all rural/urban households, per capita expenditure, number of workers and land ownership in agricultural-labour households reduce the risk of chronic poverty among labour households, while dependency ratio and the 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 the SC and OBC social groups

among rural agricultural labour households and ST, SC and OBC among the urban casual labour are associated with higher risk of chronic poverty. Contrary to the scenario of all households, rural agriculture labour households with underemployed workers have a higher probability of falling into chronic poverty. In contrast to the results for all households, the probability of a household falling into chronic poverty decreases with household size.

7. What is the impact of income on chronic poverty?

From our comparative and logistic regression analyses, we have observed a negative relationship between household expenditure (proxy for income) and incidence of chronic poverty. What is the impact of a 10 percent increase in per capita expenditure on the probability of a household falling into chronic poverty? What is its effect on the incidence of chronic poverty? To examine this further, we have computed for each sample household how a 10 percent increase in per capita expenditure would affect the probability risk, arranging these effects to arrive at group averages. The 10 percent income increase would decrease the probability of a rural chronically poor household falling into chronic poverty by 0.02 points and by 0.05 points for similar urban households. The impact of the change in probability on the mobility of households across subgroups is shown in Table 4.

As can be seen, in the rural areas after a 10 percent increase in each household’s MPCE, 68 percent of the chronically poor stay chronically poor, 32 percent exit chronic poverty, either by moving into the group of the other poor (16 percent) or crossing the poverty line to the non-poor group (16 percent). In the urban areas, after a similar increase, 71 percent of the households continue to be among the chronically poor, 29 percent escape chronic poverty (15 percent shift into the other poor group and 14 percent into the non-poor group). The 10 percent increase in each household expenditure within the group of the other poor would result in 41 percent exiting poverty in the rural regions and 32 percent in urban areas. The effect of income/expenditure increase on the chronically poor is more or less same in both environments, whereas for the other poor, the impact would be greater in the rural areas. Simple calculations show that elasticity of the incidence of chronic poverty with respect to MPCE is -3.2 percent for rural and -2.9 percent for urban households. These are very approximate estimates.

Table 4 Mobility of households across poverty groups due to a 10% increase in MPCE

	Rural				Urban			
Poverty groups	Base	CP	OP	NP	Base	CP	OP	NP
Chronically poor	100	68	16	16	100	71	15	14
Other poor	100		59	41	100		68	32

Note: First row shows the distribution of chronically poor households across the groups after a 10 percent increase in the MPCE.

8. 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, the number of children per household, dependency ratio; and decreases with household expenditure and number of days of work put in by a household.
- Among the occupational groups, the core chronically poor is made up of agricultural labour in the rural areas, and casual labour and self-employed households in urban areas, and among the social groups, the scheduled caste households in both living environments.

Our results suggest that chronically poor households tend to be concentrated at the starting phase of the family lifecycle. Households in the other poor category may be able to exit chronic poverty because of their small household size, as well as a more intensive use of labour, including child labour. While the wage rate of a labour household does not differ between the chronic and other poor households, it is substantially higher for the non-poor households. Hence, higher wage rate is of crucial importance for lifting labour households from poverty.

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 on the incidence elasticity of chronic poverty with respect to income: -2.4 for rural households according to the interstate regression, whereas the estimates computed from logit model indicate -3.2 for rural and -2.9 for urban households.

We have shown that a 10 percent increase in the per capita expenditure of the chronically poor households would lift about one-third of these from chronic poverty and one-sixth from poverty. To lift all of the chronically poor households out of poverty, approximately a 60 percent increase in per capita expenditure is required. This would be a stupendous task, given that in the 1990s, the per capita expenditure of the bottom 30 percent of the population increased 1.5 percent per annum.

We suggest that measures such as income transfers to the poor are not sufficient to reduce chronic poverty. Demographic pressure,¹¹ low wage rates, landlessness, and social factors are clearly important factors that need to be addressed. Improvements such as improved access to land for deprived groups through the provision of credit for the purchase and development of land; enforcement of the minimum wage legislation; provision of rural employment during slack seasons through the present National Rural Employment Guarantee Programme would reduce the incidence of chronic poverty. As most of the chronically poor are casual workers in the unorganized sectors, well-defined social safety net programmes, including insurance and public distribution system, would be of benefit to this group in minimizing the intensity of deprivations. Also, a balanced package of measures to improve the health and educational status of poor households, pro-poor growth policies for generating productive employment and social policies to empower deprived groups are needed to eliminate chronic poverty. It is 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.

¹¹ 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 ⁺	0.0088	0.027 ⁺	0.018
Dependency ratio	0.2423	0.0747	0.604	0.158
% Male literates	0.0007 ⁺	0.0007	0.003	0.002
% Female literates	-0.0008 ⁺	0.0008	-0.002 ⁺	0.002
Caste (Ref: others)				
SC	0.1836	0.0646	0.282 ⁺	0.132
ST	-0.0831 ⁺	0.0752	-0.075 ⁺	0.198
OBC	0.0490 ⁺	0.0650	0.016 ⁺	0.131
States (Ref: Andhra Pradesh)				
Assam	1.1000	0.1895	-1.575	0.557
Bihar	1.3380	0.1617	0.501 ⁺	0.341
Gujarat	0.7930	0.2066	0.246 ⁺	0.349
Haryana	1.3613	0.2208	1.055	0.391
Himachal Pradesh	1.4165	0.2642	-0.232 ⁺	0.687
Jammu & Kashmir	0.8028	0.2603	-0.481 ⁺	0.664
Karnataka	1.2422	0.1899	0.774	0.326
Kerala	0.5810	0.2785	0.593 ⁺	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 ⁺	0.308
Uttar Pradesh	2.3471	0.1646	1.645	0.309
West Bengal	1.1002	0.1827	-0.268 ⁺	0.345
Other states and UTs	0.3875	0.1753	-0.803	0.318
Constant	0.5634	0.1818	1.190	0.341
Nagelkerke R ²	0.476		0.489	
χ^2 value	9,361**		2,807**	
Number of observations	17,609		6,335	

Notes: ⁺ Not significant at 5% level. Other estimated coefficients are significant.^{**} Significant at 1% level.

Appendix Table A2 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 **
Himachal 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 ²	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 State-wise incidence of chronic poverty (%) by social and occupation categories of households

RURAL

State	Social group (caste)				Type of HH (occupation)					Incidence of CP (All HHs)	State-wise distribution of CP (%)
	ST	SC	OBC	Others	Artisan	Agricultural labour	Non-agricultural labour	Cultivators	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 State-wise incidence of chronic poverty (%) by social and occupation categories of households

URBAN

State no.	Social group (caste)				Type of HH (occupation)				Incidence of CP (All HHs)	State-wise distribution of CP (%)
	ST	SC	OBC	Others	Self-employed	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

State 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	Underemployed 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 UTs	-3.904	0.259
12	Nagelkerke R ²	0.828	
13	χ^2 value	38,610**	
14	Correctly classified (%)	97.1	
15	Number of observations	71,417	

Notes : 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+ yrs) worker is present; 1 otherwise
 Underemployed 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 variable: CP

State 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	Underemployed 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 ⁺	0.077	0.811
13	State (Ref: Andhra Pradesh)			
	Assam	3.426 ⁺	0.235	
	Bihar	0.488 ⁺	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 ⁺	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 UTs	2.945	0.247	
14	Nagelkerke R ²		0.83	
15	χ^2 – Value		24125 **	
16	Correctly classified (%)		96.6	

Notes: 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+ yrs) worker is present; 1 otherwise;
 Underemployed HH 0 if all workers are employed 5.5 days or more in a reference week; 1 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;
 + 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

State no.	Variable	$\hat{\beta}$	S.E.
1	Constant	15.00	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	Underemployed HH	0.273	0.117
8	Caste (Ref: others)		
	ST	-1.397	0.193
	SC	2.261	0.169
	OBC	0.732	0.167
9	State (Ref: Andhra Pradesh)		
	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 UTs	-11.02	0.895
10	Nagelkerke R^2	0.89	
11	χ^2 – Value	12536**	
12	Correctly classified (%)	97.1	
13	Number of observations	18074	

Notes: 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+ yrs) worker is present; 1 otherwise;
 Underemployed HH 0 if no worker/member is underemployed; 1 otherwise;
 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 A8 Logit model estimated for urban casual labour household data

State no.	Variable	$\hat{\beta}$	S.E.
1	Constant	-0.881 ⁺	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 ⁺	0.216
	State (Ref: Andhra Pradesh)		
	Assam	6.189	0.673
	Bihar	0.372 ⁺	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 UTs	5.935	0.684
9	Nagelkerke R ²		0.886
10	χ^2 – Value		5165 **
11	Correctly classified (%)		95.5
	Number of observations		6044

Notes: 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 HH member aged 5+ yrs is illiterate; 1 otherwise;
** Significant at 1 % level;
+ indicates statistical insignificant at 5% level;
All other coefficients are significant at 5% level.