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Regional Estimates of Multidimensional Poverty in India

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Abstract
This paper estimates and decomposes multidimensional poverty in 82 natural regions in India using unit data from the Indian Human Development Survey (IHDS), 2011–12. Multidimensional poverty is measured in the dimensions of health, education, living standard and household environment using eight indicators and Alkire-Foster methodology. The unique contributions of the paper are inclusion of a direct economic variable (consumption expenditure, work and employment) to quantify the living standard dimension, decomposition of MPI across the dimensions and the indicators, and estimates of multidimensional poverty at the sub-national level.

Results indicate that 43% of India's population are multidimensional poor with large regional variations. The average intensity of poverty was 45.5% with a MPI value of 19.3. Six states in India—Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Odisha and West Bengal who have a share of 45% of the total population—account for 58% of the multidimensional poor. Across regions, more than 70% of the population are multidimensional poor in the southern region of Chhattisgarh and the Ranchi plateau, while they comprise less than 10% in the regions of Manipur, Mizoram and Chandigarh. The economic poor have a weak association with health and household environment dimensions. The decomposition of MPI indicates that the economic dimension accounts for 22%, the health dimension accounts for 36%, the education dimension accounts for 11% and the household environment accounts for 31% of the deprivation. Based on these analyses, the authors suggest target based interventions in the poor regions to reduce poverty and inequality in India.

JEL I J Z
Keywords Multidimensional poverty index; decomposition; regions; India

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1 Introduction

During the first four decades of development studies (1950–90), poverty was primarily measured in money metric form, either from household income or consumption expenditure. The main limitation of money metric poverty was its inability to capture the multiple deprivations of human life. The development of the capability approach (Sen 1985) that focussed on enhancing human capabilities such as skills, physical abilities and self respect led to a growing interest in measuring poverty in a multidimensional space. The evolution of the human development paradigm in 1990 added a strong theoretical foundation to the measurement of multidimensional poverty. The United Nations Development Programme (UNDP) developed a set of composite indices, the Capability Poverty Measure (CPM), the Human Poverty Index 1 (HPI 1) and the Human Poverty Index 2 (HPI 2) to measure multidimensional poverty (UNDP 1996, 1997) using aggregate data. The Millennium Declaration has outlined eradication of poverty in its all forms – hunger, ill health and illiteracy. The goals, targets and indicators of the Millennium Development Goals (MDGs) were included in national and local planning (United Nations 2000). The UNDP has disseminated the multidimensional poverty index (MPI) for 104 countries (UNDP 2010). While the HPI measures poverty at the macro level, the MPI is unique as it identifies individuals (at the micro level) deprived in overlapping multiple dimensions and captures both the extent and intensity of poverty (Alkire and Santos 2010).

Following the UNDP's work, several researchers have contributed towards the measurement and estimation of multidimensional poverty (Anand and Sen 1997; Chiappero-Martinetti 2000; Bourguignon and Chakravarty 2003; Gordon et al. 2003; Qizilbash 2004; Chakravarty and D'Ambrosio 2006: Alkire and Foster 2008; Antony and Rao 2007; Calvo 2008; Wagle 2008; Jayaraj and Subramanian 2010 ; Alkire and Santos 2010; Alkire and Foster 2011; Mohanty 2011; Mishra and Ray 2013; Alkire and Seth 2015). Most of these studies used the dimensions of education, health and standard of living and a few studies included subjective well-being such as fear of facing hardship (Calvo 2008) in defining multi-dimensional poverty. However, these studies differ in measuring multidimensional poverty, for instance in fixing the poverty cut-off point of each dimension, weighting the dimensions and cut-off point in separating the poor from the non-poor. With respect to measurement, some researchers considered the union (poor

in any dimension) approach (Bourguignon and Chakravarty 2003), while others used the intersection approach (poor in two or more dimension) (Gordon et al. 2003) or relative approach (Wagle 2008) in defining the poverty line. While the union approach overestimates poverty, the intersection approach tends to underestimate poverty. The estimates of multidimensional poverty vary by choice of method and indicators used and there is no unanimity on identification and aggregation of indicators in the estimation of multidimensional poverty/well-being (Decancq and Lugo 2013; Rippin 2010).

While earlier studies used aggregate data, recent studies estimated multidimensional poverty using micro level data and a wide range of indicators. Based on the counting approach, Alkire and Foster (2008; 2011) developed a new methodology in estimating multidimensional (Alkire and Santos 2010; Coromaldi and Zoli 2012; Alkire et al. 2013; Batana 2013; Battiston et al. 2013; Santos 2013; Yu 2013). Alkire and Santos (2010) provided estimates of multidimensional poverty for many developing countries using the Demographic and Health Survey (DHS) and other large scale survey data. However, their analyses were restricted to three dimensions and had data constraints. Santos (2013) measured multidimensional poverty reduction in Bhutan from 2003 to 2007 using the Bhutan Living Standard Survey and used consumption expenditure with other indicators in measuring multidimensional poverty. Reduction in multidimensional poverty was observed irrespective of indicators, weights, deprivation cut-off and identification criterion of the poor. Significant poverty reduction was due to reduction in the proportion of poor and in the intensity of poverty, that is, among those who were less intense poor.

Batana (2013) measured multidimensional poverty among women in Sub-Saharan countries using four dimensions – assets, health, schooling and empowerment. The ranking of multidimensional poverty is different from that bsed on the Human Development Index (HDI) or on Income poverty. The decomposition analysis reveals that deprivations in schooling and lack of empowerment among women contribute to poverty. Battiston et al. (2013) measured multidimensional poverty in six Latin American countries by combining indicators derived from the income based and unsatisfied basic needs (UBN) approaches and used Alkire-Foster and Bourguignon-Chakravarty (BC) measures of poverty. While measuring poverty, both income based and UBN indicators are relevant in targeting the poor. In the Indian context, some attempt has been made

to estimate multidimensional poverty using unit data. Jayaraj and Subramanian (2010) estimated the multidimensional deprivation using the Chakravarty-D'Ambrosio approach. Using the unit data from NFHS, they included eight dimensions and found a reduction of multidimensional poverty during 1993–2006. Mishra and Ray (2013) used both NFHS and NSS data sets and provided estimates of multiple deprivation in India based on expenditure dimensions and non-expenditure dimensions such as access to drinking water and clean cooking fuel, child stunting and mothers' BMI. They found a significant reduction in multidimensional poverty across the states over time irrespective of the dimensions included, the measurement methods and datasets (Mishra and Ray 2013). Mohanty (2011; 2012), using the unit data from NFHS 3, linked multidimensional poverty with child health and maternal care utilisation. Children belonging to multidimensional poor households are more likely to be deprived of health care and have lower survival rates. Alkire and Seth (2013) suggested a new method using binary scoring method, which can be updated periodically, to target households below the poverty line (BPL) in India. In a recent paper, Alkire and Seth (2015) estimated the change in multidimensional poverty in the states of India between 1998–99 and 2005–06 and found that the decline in poverty during the 1999–2006 period was uneven.

2 Aim and Rationale

Though eradication of multidimensional poverty has been at the centre of India's development agenda, very few studies have estimated multidimensional poverty. This paper aims at providing estimates of multidimensional poverty at the disaggregated level, in the regions of India, and decomposing multidimensional poverty across dimensions and regions. We have measured multidimensional poverty by including direct economic variables rather than economic proxies, incorporated the missing dimensions of work/employment and household environment, provided estimates for 82 regions of India, and disaggregated the estimates across dimensions, indicators and regions.

We put forward the following rationale in support of the study. First, the state level analyses conceal large variations across the regions of India. The regions of India are classified based on agro-climatic conditions and are homogenous with

respect to economic, social, cultural and demographic variables. The variations in socioeconomic development among the regions of India are large. Regional estimates of multidimensional poverty will be helpful in identifying the backward areas for policy intervention. Second, earlier studies in India (Alkire and Seth 2013; Mohanty 2011) used economic proxies rather than direct economic variables in measuring living standards and were restricted to three dimensions – health, knowledge and living standard. We have included key missing variables such as consumption expenditure, work/employment in estimating multidimensional poverty. It may be mentioned that most of the studies in India are based on NFHS data that does not have direct economic variables. Studies suggest that economic proxies are weak predictors of the economic well-being of households and so these indicators are not truly reflexive of multidimensional poverty (Srivastava and Mohanty 2010; Montgomery et al. 2000). For the first time, we provide estimates of multidimensional poverty at the disaggregated level (for 82 regions of India) and decompose the MPI by indicators, regions and states to stress the relative contribution of the various factors in explaining multidimensional poverty.

3 Data

The Indian Human Development Survey 2 (IHDS 2), 2011–12, conducted by the University of Maryland and the National Council of Applied Economic Research (NCAER), New Delhi is used for the analyses. The IHDS 2 survey interviewed 42,152 households and covered 204,568 individuals from 1420 villages and 1042 urban blocks of India. The advantage of using the IHDS 2 survey in estimating multidimensional poverty is that it provides comprehensive information on the key dimensions of income, consumption expenditure, wealth and work/employment and also health of children and mothers. The details of the survey design, sampling instrument, variables and constructed variables, and various codes used are available in the national report (Desai et al. 2015).[1] From the data file, we have created regional variables based on the classification of the 68th round of National Sample Survey (NSS) of 2011–12 and this forms the basis of analyses. In the dry

[1] The missing data accounts for a very small fraction and was therefore excluded from the analyses.

region of Gujarat, the sample size was too small and this area was therefore merged with that of the Northern Plains region of Gujarat. A new state named Telanga was carved out from the state of Andhra Pradesh in 2014. Our analyses is for undivided Andhra Pradesh and we refer to it as undivided Andhra Pradesh throughout the paper.

4 Methods

4.1 Dimensions and Indicators

In measuring multidimensional poverty, four dimensions are considered, namely health, education, economic and household environment. Three of our dimensions are similar to those of global MPI (health, education and standard of living). These four dimensions comprise a total of eight indicators, two for each dimension. The description of the dimensions, indicators and weight of each indicator is shown in Table 1.We briefly describe the rationale of including each of the dimensions and indicators.

4.2 Education Dimension

Education, the key domain of human capital is positively linked to productivity. To capture the education domain, we have used two variables, namely, enrolment of children at school going age and years of schooling of adult members (15 years and above). The household is considered deprived in school enrolment if at least one school going child aged 6–14 years (classified as school going age in India) in the household is not enrolled at school (at the time of data collection). Similarly, a household is deprived in years of schooling indicator if no adult member aged 15 years and more in the household has completed five years of schooling. Both indicators cover all age groups.

4.3 Economic Dimension

In the global MPI, there is no direct economic variable, either income or consumption expenditure. Though, poverty is multidimensional, the economic dimension is one of the key components of multidimensional poverty. We have included two variables, namely, the consumption expenditures and duration of employment to capture the economic domain of multidimensional poverty. It may be mentioned that the poverty estimates in India are based on consumption expenditure collected by the NSS over the last four decades. These data sets are of good quality and used extensively by academia, policy makers and international organisations (Deaton 2003); Deaton and Dreze 2002). Consumption expenditure is a direct economic variable and should be preferred to economic proxies. With respect to work/employment, we have included job-security as a key indicator. A household is said to be poor if any member of the household does not have adequate work (183 days in the year preceding the survey). A member working less than 183 days in a year is known as a marginal labourer and this reflects employment insecurity in the population.

4.4 Health Dimension

The health domain contains two indicators, namely, married women's access to nutrition and the accessibility of the household to health insurance. A woman (ever married) is considered undernourished (15–49 years) if her Body Mass Index is less than 18.5. The utility of undernutrition in estimating multidimensional poverty has been emphasized in earlier studies (Berenger and Verdier-Chouchane 2007; Alkire and Foster 2008; Subramanian 2011). The second variable considered for health is access to health insurance. In the wake of increasing non-communicable diseases, health spending is catastrophic for a large section of the household in India (Garg and Karan 2009; Ghosh 2011). Though various governments including the Government of India are considering universal health coverage, the coverage is low in India. In a recent move, economists from 44 countries called for a global move to support universal health coverage as an essential pillar of development (Lawrence 2015).

4.5 Housing Environment

We have included housing environment as a dimension in multidimensional poverty. Two indicators, namely, access to improved drinking water and improved sanitation are used to quantify housng environmnet. A household is defined as deprived in water if it does not have access to improved drinking water.[2] Similarly, a household is considered deprived in sanitation if it does not have a flush toilet or semi-flush (septic tank) latrine facility. Both these indicators of household environment dimensions are determinants of health and are directly linked to infectious diseases.

4.6 Measurement of Multidimensional Poverty

Following identification of the dimensions and indicators, the weights assigned to each dimension and indicator are critical in multidimensional poverty. A large and growing literature on multidimensional poverty, multidimensional well-being, social exclusion and composite indices invariably used both continuous and dichotomous data and varying weighting structure (Chakravarty and D'Amborsio 2006; Jayaraj and Subramanian 2010; Mishra and Shukla 2015). Decancq and Lugo (2015) have systematically reviewed the merits and limitations of eight different approaches used in assigning weights to variables in composite/ multidimensional indices. We have followed Alkire and Foster's (2008; 2011) method of computing multidimensional poverty by assigning weights based on a normative approach, but we differ in fixing the cut-off point and indicators.We have assigned equal weight to each dimension and equal weight to variables within each dimension. Since there are four dimensions and eight indicators, the weight of each indicator is 1/8. The dual cut-off point used in identifying the poor in each indicator is shown in Table 1. The cut-off point for weighted deprivation is fixed at a value of 0.26 as it captures multidimensional poverty. Because we have four dimensions, a person will be poor in more than one dimension if and only if the weighted deprivation score is more than 0.25. A brief description of poverty Head-

[2]Drinking water is considered as improved if the source or drinking water is from piped water, tube well, hand pump, covered well, rainwater and bottled water.

Table 1: Dimensions, Indicators and Weights used in the Computation of Multidimensional Poverty Index (MPI) in India

Sl No	Dimensions	Description of Indicators	Weights	Mean	Std. Dev.
1	Education	**School Enrolment (V1)**: At least one child in the school going age (6-14 years) in the household currently not attending in school	**0.125**	0.062	0.240
		Years of Schooling (V2): No adult member (15 years and above) in the household has completed five years of schooling	**0.125**	0.138	0.345
2	Economic	**Consumption Expenditure (V3)**: If the household falls below the consumption expenditure threshold limit (official poverty line)	**0.125**	0.212	0.409
		Employment (V4): Any member in the household (15+) has not worked 183 days or more in the year preceding the survey	**0.125**	0.209	0.406
3	Health	**Nutrition (V5)**: The household has any undernourished (BMI <18.5) ever married women (15-49 years)	**0.125**	0.166	0.372
		Health Insurance (V6): The household does not have any health insurance	**0.125**	0.880	0.325
4	Household environment	**Water (V7)**: The household does not have access improved drinking water	**0.125**	0.111	0.314
		Sanitation (V8): The household does not have access to improved sanitation	**0.125**	0.633	0.482
N= 199728					

count ratio (H), intensity of poverty (A) and multidimensional poverty is given below.

The headcount ratio is the proportion of the population who are multidimensional poor. The headcount ratio is computed as:

$$H = \frac{q}{n} \tag{1}$$

where, q is number of multidimensional poor, n is total population.

The intensity of poverty (A) or the breadth of deprivation captures the average weighted count of deprivations experienced by the multidimensional poor. The intensity of poverty (A) is computed as

$$A = \frac{\sum_1^q c}{q} \tag{2}$$

where, c is the total weighted deprivations experienced by the poor.

The multidimensional poverty index (MPI) is the product of the two measures, headcount ratio (H) and intensity of poverty (A). The headcount ratio is the share of multidimensional poor in the total population. The intensity of poverty is the average value of the weighted deprivations experienced by the multidimensional poor at a time. The MPI is computed as:

$$MPI = H * A \tag{3}$$

4.7 Decomposition of MPI

We have further decomposed the *MPI* by its component indicators. The censored headcount ratio is first identified to decompose *MPI* into each indicator. The censored headcount ratio is defined as the share of multidimensional poor deprived in the given indicator in the total population. The contribution of deprivation of a particular indicator is computed as:

$$\text{Contribution of Indicator i to MPI} = \frac{w_i CH_i}{MPI_{country}} * 100 \tag{4}$$

where w_i is the weight of i^{th} indicator and CH_i is the censored headcount ratio of i^{th} indicator.

The contribution of each region to overall poverty is computed by using the following formula:

$$\text{Contribution of region i to MPI} = \frac{\frac{n_i}{n} MPI_i}{MPI_{country}} * 100 \quad (5)$$

where n_i is the population of i^{th}region and n is the total population. MPI_i is the MPI of the i^{th}region.

We have also estimated multidimensional poverty using an alternative approach – the Jayaraj and Subramanian (2010) method, which is an extension of the Chakravarty and D'Ambrosio (2006) method. The Jayaraj and Subramanian formulation is given as

$$\prod_{\propto} = \sum_{J=1}^{K} \left(\frac{J}{K}\right)^{\propto} * H_J$$

where H_j is the proportion of population that is deprived in exactly j dimensions (j=1,2,….K)

K is the number of dimensions

π is the family of multidimensional headcount indices and π_0 is the proportion of population deprived in at least one dimensions and it reflects the union method of identifying poor.

The D-curve is specific combination of indices π_0 and π and can be obtained as

$M= \pi_1 - \pi_0/2K$

The D curve is analogous to the way Gini index is derived from Lorenz Curve.

These estimates are generated at the state level and compared with our estimates. We prepared state and region maps of multidimensional poverty index using ArcGIS software package (ArcMap 10) to show the spatial variation of multidimensional poverty.

5 Results

5.1 Dimensional Poor

We begin the discussion by presenting an overall picture of the dimensional poor. In India, 17% of the population were poor either in school enrolment or years of

schooling (adult), 36% of the population were poor either in consumption or in employment, 66% were poor in access to water or sanitation and 90% were poor in health insurance or on nutrition. The higher percentage of health poor is due to the inclusion of health insurance. Table 2 provides the cross classification of education and health poor by economic poor and non-poor. At the national level, among those who are economically poor, 27% are educationally poor, 89.8% are health poor and 88.7% are poor in household environment. Similarly, among those who are economically non-poor, 12% are educationally poor, 90.4% are health poor and 90.7% are poor in household environment. The correlation coefficients between those who are economic poor and those who are education poor, health poor or household environment poor was are respectively 0.70, 0.11 and 0.55 (correlations computed at the state level).

Table 2: Percentage of Education, Health and Environment Poor vs Economic Well-being in India

Poor and Non-poor in Economic domain	**Health Poor**	**Education Poor**	**Household Environment Poor**	**N**
Poor	89.8	27.0	88.7	131546
Non-poor	90.4	12.0	90.7	68182
Total	90.0	17.5	90.0	199728

5.2 Multidimensional Poverty in the States of India

Table 3 provides the estimates of poverty at the state level using the Alkire and Foster method, the Jayaraj and Subramanian (2010) and the Alkire and Seth approaches. Multidimensional poverty at the national level (using the Alkire and Foster method) was 42.7% [CI:34.2–45.8] and close to the estimates of Alkire and Seth (2015) (48.5%). While Alkire and Seth estimates pertain to 2005–06, our estimates pertain to 2011–12. Our estimates of multidimensional poverty are higher than the estimates of official consumption poverty provided by the Planning Commission, Government of India for the same period (Govt of India 2013). The average intensity among poor (A) is 0.45, indicating that on average, the poor are

deprived in 45% of the weighted indicators. The *MPI* is the share of population that are multidimensional poor adjusted by the intensity of deprivation. The *MPI* value of 0.19 indicates that the poor in the country experience 19% of the possible deprivations a society could experience. Among the bigger states of India (states with population of more than 10 million), our estimate of multidimensional poverty was highest in Jharkhand (66.8%) followed by Odisha, Bihar, Chhattisgarh and Rajasthan. All these states are also marked in red in Map 1 (on page 16) showing higher *MPI* values. Multidimensional poverty was smallest in the state of Kerala, followed by Punjab and Jammu and Kashmir. Among the smaller states, the variation in multidimensional poverty estimates was large, from 44.6% in Sikkim to less than 1% in Manipur. The *MPI* value varied largely across the states. Among the bigger states, the MPI was highest in Jharkhand (0.314) followed by Odisha (0.295), Chhattisgarh (0.278), Bihar (0.271) and Rajasthan (0.266). The lowest *MPI* value was observed in the state of Kerala with the MPI value of 0.055. The correlation coefficient of our estimates with Alkire-Foster estimates is 0.75 and the state patterns in multidimensional poverty remain similar in these two estimates.

5.3 Poverty Estimates using Alternative Methods

The estimates derived from Jayaraj and Subramanian method are presented with a range of alternatives, by varying the multidimensional deprivation. The subscript 1, 2, 3 and 4 represents the percentage of population who are poor in one dimension, two dimensions, three dimensions and four dimensions. Our estimates derived from the Alkire and Foster method and the Jayaraj and Subramanian method of multidimensional poverty are similar for those poor in one dimension and more (Π_1).

Table 3: Comparison of Headcount Ratio (H), Intensity of Poverty (A) and Multidimensional Poverty (M0) with the Estimates provicdded by Jayraj and Subramanian and by Alkire and Seth at the state level in India

States	Estimates based on Alkire and Foster method, 2011-12			Estimates based on Jayraj and Subramanian method, 2011-12						Alkire and Seth, 2006		
	H (%)	A (%)	MPI	(Poor in any dimension) $\pi 0$	Poor in 1+ dimension ($\pi 1$)	Poor in 2+ dimension ($\pi 2$)	Poor in 3+ dimension ($\pi 3$)	Poor in 4 dimension ($\pi 4$)	M (area above D-curve)	H (%)	A (%)	MPI
Andhra Pradesh	35.6	43.0	0.153	0.959	0.494	0.300	0.206	0.154	0.456	41.6	46.6	0.194
Arunachal Pradesh	25.8	42.0	0.108	0.967	0.480	0.273	0.173	0.119	0.445	51.5	50.6	0.26
Assam	43.0	43.9	0.189	0.991	0.545	0.355	0.258	0.203	0.500	54.9	51.9	0.285
Bihar	57.0	47.6	0.271	0.995	0.631	0.456	0.360	0.302	0.574	72	57.8	0.416
Chandigarh	4.5	37.5	0.017	0.933	0.303	0.113	0.049	0.024	0.289	NA	NA	NA
Chhattisgarh	56.6	49.1	0.278	0.952	0.578	0.401	0.304	0.245	0.528	NA	NA	NA
Dadra and Nagar Haveli	18.0	42.3	0.076	1.000	0.448	0.222	0.119	0.069	0.421	NA	NA	NA
Daman & Diu	25.1	41.1	0.103	0.980	0.435	0.222	0.127	0.080	0.407	NA	NA	NA
Delhi	12.2	41.9	0.051	0.886	0.341	0.160	0.089	0.057	0.321	NA	NA	NA
Goa	8.4	38.2	0.032	0.975	0.373	0.167	0.086	0.049	0.352	13.2	42.8	0.057
Gujarat	34.7	45.1	0.156	0.969	0.477	0.280	0.189	0.140	0.442	36	48.6	0.175
Haryana	27.1	42.9	0.116	0.966	0.440	0.245	0.158	0.114	0.409	33.1	46.5	0.154
Himachal Pradesh	31.1	41.6	0.129	0.960	0.480	0.274	0.173	0.119	0.446	24.3	41.2	0.1
Jammu & Kashmir	27.6	42.4	0.117	0.960	0.422	0.219	0.130	0.086	0.395	31.7	46.2	0.146
Jharkhand	66.8	47.0	0.314	0.989	0.621	0.439	0.336	0.271	0.566	NA	NA	NA
Karnataka	37.2	43.3	0.161	0.971	0.507	0.309	0.213	0.160	0.468	37.5	46.2	0.173
Kerala	14.1	39.3	0.055	0.846	0.180	0.086	0.053	0.038	0.169	9.5	39.9	0.038
Madhya Pradesh	53.7	46.3	0.248	0.971	0.547	0.358	0.260	0.204	0.502	62.4	52.6	0.329
Maharashtra	36.3	43.7	0.158	0.969	0.482	0.283	0.188	0.136	0.447	32.9	47	0.155
Manipur	0.8	37.5	0.003	0.932	0.339	0.139	0.063	0.030	0.322	32.4	45.7	0.148

Meghalaya	33.3	42.0	0.140	1.000	0.463	0.260	0.169	0.122	0.431	55.2	53.9	0.297
Mizoram	3.6	45.6	0.016	0.528	0.181	0.074	0.036	0.021	0.172	21.1	44.2	0.094
Nagaland	21.1	46.5	0.098	0.993	0.446	0.244	0.156	0.111	0.415	44.4	49.1	0.218
Odisha	60.6	48.6	0.295	0.992	0.628	0.446	0.342	0.278	0.573	58.7	52.6	0.309
Pondicherry	7.2	38.6	0.028	0.655	0.269	0.130	0.071	0.043	0.253	NA	NA	NA
Punjab	14.5	43.3	0.063	0.968	0.373	0.179	0.105	0.071	0.351	19.2	45.8	0.088
Rajasthan	55.8	47.6	0.266	0.988	0.588	0.402	0.303	0.244	0.538	58.5	53	0.31
Sikkim	44.6	44.7	0.200	1.000	0.551	0.335	0.223	0.162	0.509	28.9	45.6	0.132
Tamil Nadu	30.4	41.9	0.127	0.973	0.477	0.275	0.179	0.128	0.442	26.4	41.7	0.11
Tripura	21.3	41.8	0.089	0.983	0.557	0.354	0.267	0.224	0.513	46.6	48.6	0.226
Uttar Pradesh	49.4	45.3	0.224	0.984	0.568	0.377	0.276	0.218	0.521	59.5	52.8	0.314
Uttarakhand	40.9	45.6	0.187	0.960	0.517	0.314	0.210	0.152	0.477	NA	NA	NA
West Bengal	42.8	46.1	0.198	0.986	0.556	0.372	0.280	0.229	0.510	53.8	52.6	0.283
India	**42.7**	**45.5**	**0.194**	**0.971**	**0.527**	**0.337**	**0.242**	**0.188**	**0.485**	**48.5**	**51.7**	**0.251**

NA: Not available. M =$\boldsymbol{\pi 1 - \pi 0/2}$

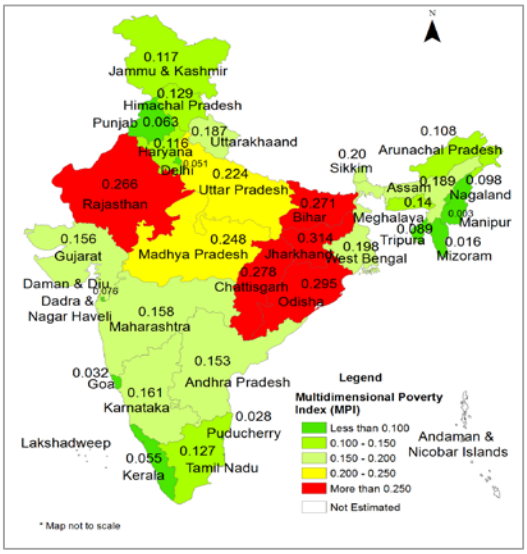
5.4 Poverty Estimates at the Regional Level

Our main goal was to provide estimates of poverty in the different regions of India. Map 1 and Map 2 present multidimensional poverty headcount ratio in the states and regions of India respectively. Map 3 and Map 4 present the *MPI* in the states and regions of India. Table A.1 provides our main results, spread in 12 columns. It begins with the serial number of the regions, name of the state and region, the estimated headcount ratio, intensity of poverty, MPI, rank of regions by *MPI*, share of *MPI* in the region, the percentage of population in the region and sample size of the regions. Standard errors are also reported along with *H*, *A* and *MPI*. The estimated headcount ratio varies largely between the regions, being equal to 76.2% in the southern regions of Chhattisgarh and 71.1% in the Ranchi Plateau, followed by 66% in southern Uttar Pradesh and 65% in Southern Odisha. It was minimum in the regions of Manipur (0.8%). The headcount ratio varies largely among the regions within the states. For example, the headcount ratio in the state of Maharashtra ranges from 7.4% in the coastal region to 52.1% in the eastern region. The intensity of poverty was high in the southern region of Rajasthan (50.4). On the other hand, the intensity of poverty was low in Manipur

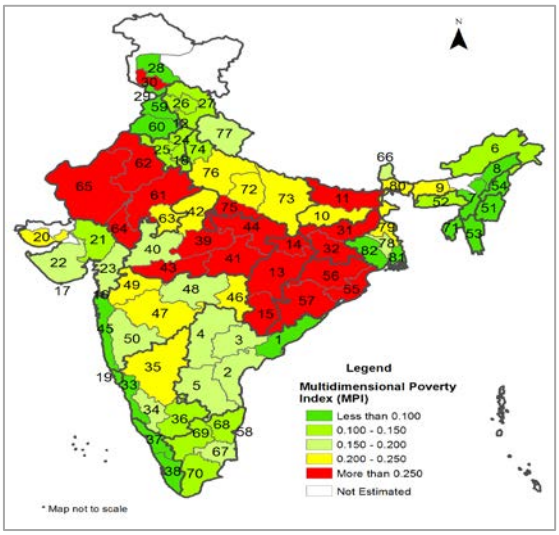
region where the multidimensional poor were deprived in 37.5% of the MPIs total weighted deprivation score.

Regional variation of MPI is also shown in Map 4. The regions are grouped into five categories according to the MPI values: less than 0.100 (lowest), 0.100–0.150, 0.150–0.200, 0.200–0.250 and more than 0.250 (highest). Two regions each from Kerala, Jammu and Kashmir, West Bengal, Assam, and Punjab, one region each from Haryana, Maharashtra (coastal region), Goa, Delhi, Chandigarh, Dadra Nagar Haveli, Daman and Diu, Puducherry, Tripura Mizoram, Manipur, Nagaland, Karnataka and (undivided) Andhra Pradesh fall under the first category. The second category comprises 12 regions, the third category 13 regions, and the fourth category, 14 regions. The regions under the fifth category are from Chhattisgarh, Rajasthan and Odisha, four regions from Madhya Pradesh, and one region each from Uttar Pradesh, Maharashtra, Bihar, Jharkhand. In Table A.1, column 7 provides the MPI values and column 9 provides the rank in MPI value among the regions of India. The MPI values vary from a low of 0.08 in Manipur to a high of 0.381 in the southern region of Chhattisgarh. The variability in MPI values is also large in regions within the state. For example, in the case of Uttar Pradesh, the MPI values vary from 0.33 in the Southern region (ranked 80) to 0.12 in the Northern Upper Ganga plain (ranked 29). The coefficient of variation in MPI in the regions of India was 53.4% indicating a large variation across regions. On ranking all the regions in ascending order, we found that regions in the state of Chhattisgarh and Odisha have a higher value of MPI and a lower rank compared to the other regions. However, the coefficient of variation of the intensity of poverty was 7.3%, indicating low variability in the intensity of poverty across the regions of India.

Map 1: Poverty Headcount Ratio (%) in the States and Union Territories of India of India, 2011–12

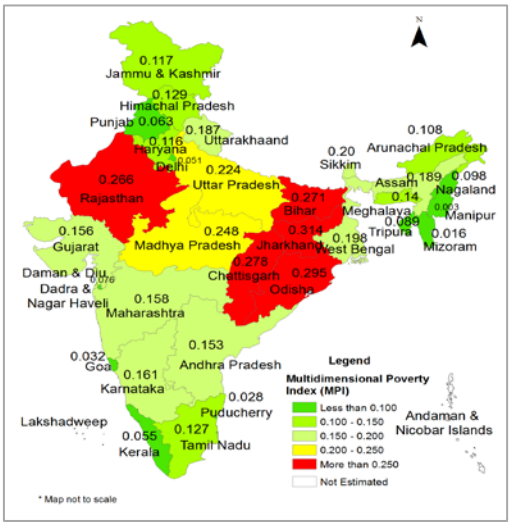


Map 2: Poverty Headcount Ratio (%) in the Regions of India, 2011–12

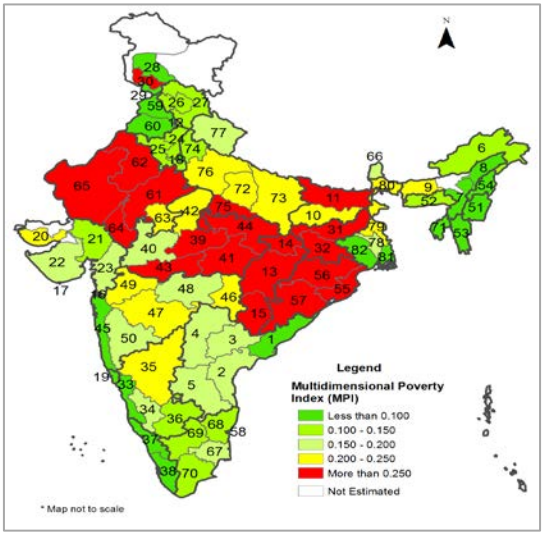


For the numbering see page 18.

Map 3: Multidimensional Poverty Index (MPI) in the States and Union Territories of India, 2011–12



Map 4: Multidimensional Poverty Index (MPI) in Regions of India, 2011–12



For the numbering see page 18.

Regions of India

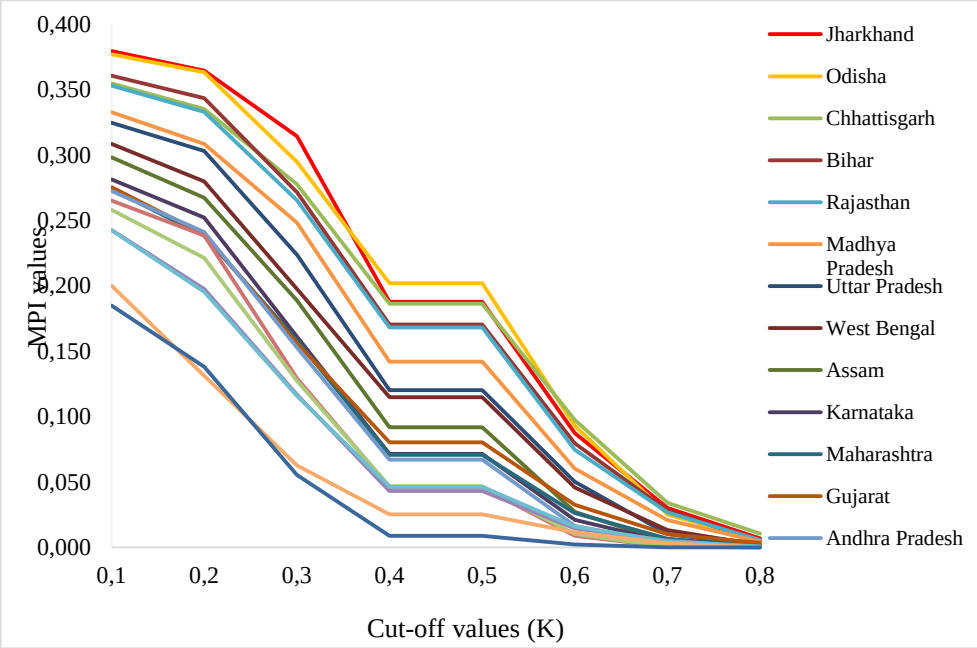
1. Coastal Northern (Andhra Pradesh)	23. South Eastern (Gujarat)	41. Northern (Madhya Pradesh)	62. Northern (Rajasthan)
2. Coastal southern (Andhra Pradesh)	24. Eastern (Haryana)	42. South (Madhya Pradesh)	63. South-Eastern (Rajasthan)
3. Inland North Eastern (Andhra Pradesh)	25. Western (Haryana)	43. South Western (Madhya Pradesh)	64. Southern (Rajasthan)
4. Inland North Western (Andhra Pradesh)	26. Central (Himachal Pradesh)	44. Vindhya (Madhya Pradesh)	65. Western (Rajasthan)
5. Inland Southern (Andhra Pradesh)	27. Trans Himalayan & Southern (Himachal Pradesh)	45. Coastal (Maharashtra)	66. Sikkim
6. Arunachal Pradesh	28. Jhelum Valley(Jammu & Kashmiri)	46. Eastern (Maharashtra)	67. Coastal (Tamil Nadu)
7. Cachar Plain (Assam)	29. Mountainous (Jammu & Kashmiri)	47. Inland Central (Maharashtra)	68. Coastal Northern (Tamil Nadu)
8. Plains Eastern (Assam)	30. Outer Hills(Jammu & Kashmiri)	48. Inland Eastern (Maharashtra)	69. Inland (Tamil Nadu)
9. Plains Western (Assam)	31. Hazaribag Plateau (Jharkhand)	49. Inland Northern (Maharashtra)	70. Southern (Tamil Nadu)
10. Central (Bihar)	32. Ranchi Plateau (Jharkhand)	50. Inland Western (Maharashtra)	71. Tripura
11. Northern (Bihar)	33. Coastal and Ghats (Karnataka)	51. Manipur	72. Uttarakhand
12. Chandigarh	34. Inland Eastern (Karnataka)	52. Meghalaya	73. Central (Uttar Pradesh)
13. Mahanadi Basin (Chhattisgarh)	35. Inland Northern (Karnataka)	53. Mizoram	74. Eastern (Uttar Pradesh)
14. Northern (Chhattisgarh)	36. Inland Southern (Karnataka)	54. Nagaland	75. Northern upper Ganga Plain (Uttar Pradesh)
15. Southern (Chhattisgarh)	37. Northern (Kerala)	55. Coastal (Odisha)	76. Southern (Uttar Pradesh)
16. Dadra & Nagar Haveli	38. Southern (Kerala)	56. Northern (Odisha)	77. Southern Upper Ganga Plains (Uttar Pradesh)
17. Daman & DIU	39. Central (Madhya Pradesh)	57. Southern (Odisha)	78. Central Plains (West Bengal)
18. Delhi	40. Malwa (Madhya Pradesh)	58. Puducherry	79. Eastern Plains (West Bengal)
19. Goa		59. Northern (Punjab)	80. Himalayan (West Bengal)
20. Kachchh (Gujarat)		60. Southern (Punjab)	81. Southern Plains (West Bengal)
21. Plains Northern (Gujarat)		61.North-Eastern (Rajasthan)	82. Western Plains (West Bengal)
22. Saurashtra (Gujarat)			

5.5 Robustness of the Estimation

Dominance analysis is used to check the robustness of the estimation of multidimensional poverty index values across deprivation cut-off (k). The MPI values are estimated using different deprivation cut-offs (k) among the bigger states of India. The dominance relations among the states are shown in Figure 1. Each curve in the Figure indicates the poverty level in the states when k is varied. If a curve lies below or above another curve, we can say a dominance relation exists between the two states. On the other hand, when two curves cross each other, there is no clear dominance. There are many dominance relations between the states as is evident from this Figure. For example, the curve of Rajasthan lies

above Madhya Pradesh showing a dominance relationship between these two states.

Figure 1: Poverty Comparisons as Poverty Cut-off *k* varies among the Bigger States of India, 2004–05



5.6 Decomposition of MPI by Dimensions and Component Indicators

Decomposition is an important and useful tool to understand the contribution of each dimension and indicator to multidimensional poverty. At the state and regional levels, decomposition results are presented across dimensions and indicators (Table A.2). Among the eight indicators, the deprivation related to access to health insurance contributes the most (27%) to overall poverty, followed by sanitation (26.4%). The other indicators in order of their deprivation are consumption poor, job insecurity, underweight, years of schooling, drinking water

and school enrolment. Among the four dimensions, it is clear that deprivation in health and household environment contribute more to overall poverty, followed by the economic dimension and education dimension.

State level variations among the deprivation indicators are robust. In most of the states, deprivation in access to health insurance and sanitation contributes the most, compared to the other deprivation indicators Among the bigger states, sanitation contributes more to the MPI in the states of Chhattisgarh, Bihar, Uttar Pradesh and Madhya Pradesh, while in all the other states health insurance contributes more. It has been observed that job insecurity has a significant contribution in most of the states. Among the major states, the contribution of job insecurity is high in Kerala (19.5%) followed by (undivided) Andhra Pradesh and Bihar. Hence, it is worth noting that in all the states, health and household environment are two leading contributors to multidimensional poverty.

The contribution of the dimensions and indicators to overall poverty is mixed across regions. Health insurance sanitation, consumption poverty and undernutrition contribute more to the MPI in most of the regions. The contributions of each indicator to poverty were not even among the regions within the states. For example, in the undivided state of Andhra Pradesh, the contribution of consumption expenditure was low in the coastal northern and inland north eastern regions compared to the contribution of underweight, years of schooling, occupation, sanitation and cooking facility.

5.7 Decomposition of MPI by Regions

Columns 10 and 11 in Table A.1 give the contribution (in %) to the *MPI* and the population share of the different regions. We found that Uttar Pradesh is home to the largest number of multidimensional poor, where 15.8% of the population account for more than 18% of the multidimensional poor. This is also true for the states of Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Odisha, and Rajasthan, where the share of poverty is higher than the population share. These six Indian states are home to 59% of the multidimensional poor and they account for 45% of the total population. Among the regions, Eastern Uttar Pradesh has the largest share of multidimensional poverty. It is home to more than 9% of the total multidimensional poor, though it has only 7.8% of the total population. It is also found that the contribution of regions to multidimensional poverty varies within

the states. In Maharashtra, the coastal region contributes only 0.3% while it shares 2% of the total population. On the other hand, the inland central region contributes 1.7%, while it shares only 1.5% of the total population.

6 Discussion and Conclusion

Multidimensional poverty is a priority research agenda, both nationally and globally. Globally, the UNDP took the initiative to measure poverty in a multidimensional space while the UN Millennium Declaration 2000 put forward eight MDG goals, eighteen targets and a set of indicators to eradicate poverty in all forms – hunger, illiteracy and disease. At the national level, the Planning Commission, Government of India has acknowledged the multidimensional nature of poverty, though it continued to provide the estimates based on money metric poverty. Thus, the need and utility of multidimensional poverty has been established in national and international development agendas. There are now extensive studies on the measurement of multidimensional poverty. Yet, there is no unanimity in the identification and aggregation of indicators. Many of the estimates are based on contextual and normative decisions.

In India, only a few studies estimated multidimensional poverty using unit data from NFHS (Alkire and Seth 2015; Jayaraj and Subramanian 2010; Mohanty 2011). These studies use economic proxies and are confined to three dimensions. Previous studies in India were based on National Family and Health Surveys (NFHSs) and limited to state level analyses and did not incorporate any direct economic variable. This paper is an improvement on earlier studies with respect to dimension, variable and coverage. First, we have included direct economic variables, the monthly per capita expenditure and the duration of work/employment in the economic domain to estimate multidimensional poverty. Second we have provided the estimates for 82 natural regions that vary largely in the level of development.

Our salient findings are as follows. First, the extent of multidimensional poverty varies largely among the regions of India. While the multidimensional poor comprise more than 70% of the population in the regions of the Mahanadi basin and the southern regions of Chhattisgarh and Vindhya region of Madhya Pradesh, they comprise less than 10% in the coastal region of Maharashtra, Delhi,

Goa, mountainous region of Jammu and Kashmir, hills and plains of Manipur, Puducherry and Sikkim. Second, the differentials in multidimensional poverty are also large among the regions within the states of India. For example, in the state of Maharashtra, the regional estimates in MPI vary from 52% in the eastern region to 7% in the coastal region. Third, the decompositions of MPI by dimensions show that the deprivation in health contributes largely to the MPI in most of the states followed by deprivation in household environment, work/employment and education. Sanitation and cooking fuel contribute more to overall poverty in the household environment dimension. Fourth, decompositions by regions have shown higher concentrations of poverty in some parts of the country. We also found that the states of Bihar, Jharkhand, Chhattisgarh, Odisha, Madhya Pradesh, Uttar Pradesh and West Bengal that account for about 45% of India's population have a concentration of more than 50% of the multidimensional poor.

Based on these findings, we suggest that attempts be made to provide estimates at the district level, as the district is the centre of planning and programme implementation in India. We also suggest targeted interventions in the backward regions to reduce poverty and inequality.

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Appendix

Table A.1: Head Count Ratio (H), Intensity of Poverty (A), Multidimensional Poverty Index (MPI) and Decomposition of MPI Value at State and Regional Level in India, 2004–05

	State/ Region	Headcount Ratio (H)		Intensity of Poverty (A)		MPI		Rank of regions by MPI	Contribution to MPI (%)	Share of population (%)	N
		H (%)	SE	A (%)	SE	MPI value	SE				
Col. 1	*Col.2*	*Col.3*	*Col.4*	*Col. 5*	*Col.6*	*Col.7*	*Col.8*	*Col.9*	*Col.10*	*Col.11*	*Col.12*
Sl No.	**INDIA**	**42.7**	**0.036**	**45.5**	**0.002**	**0.194**	**0.020**		**100.0**	**100.0**	**199728**
	(undivided) Andhra Pradesh	**35.6**	**0.023**	**43.0**	**0.004**	**0.153**	**0.016**		**5.4**	**6.9**	**8685**
1	Coastal Northern	21.1	0.046	41.5	0.006	0.09	0.022	16	0.5	1.1	1226
2	Coastal Southern	40.3	0.057	41.6	0.004	0.17	0.027	41	0.9	1.1	1166
3	Inland North Eastern	44.1	0.068	42.8	0.009	0.19	0.028	47	1.2	1.3	1153
4	Inland North Western	35.6	0.061	44.3	0.015	0.16	0.040	37	1.7	2.1	3246
5	Inland Southern	35.0	0.055	43.3	0.009	0.15	0.027	36	1.1	1.4	1894
6	Arunachal Pradesh	25.8	0.059	42.0	0.025	0.11	0.019	27	0.1	0.1	650
	Assam	**43.0**	**0.030**	**43.9**	**0.012**	**0.189**	**0.022**		**2.4**	**2.4**	**4406**
7	Cachar Plain	5.6	0.026	37.5	0.097	0.02	0.010	4	0.0	0.1	286
8	Plains Eastern	18.0	0.031	42.4	0.016	0.08	0.007	15	0.1	0.3	1015
9	Plains Western	47.9	0.045	44.0	0.010	0.21	0.019	50	2.2	2.1	3105
	Bihar	**57.0**	**0.021**	**47.6**	**0.004**	**0.271**	**0.014**		**10.3**	**7.3**	**8242**
10	Central	48.9	0.024	46.9	0.007	0.23	0.015	58	3.9	3.3	4076
11	Northern	63.8	0.036	48.1	0.007	0.31	0.015	78	6.3	4.0	4166
12	**Chandigarh**	**4.5**	**0.020**	**37.5**	**0.097**	**0.02**	**0.011**	**3**	**0.0**	**0.1**	**358**
	Chhattisgarh	**56.6**	**0.033**	**49.1**	**0.008**	**0.278**	**0.016**		**4.2**	**2.9**	**6293**
13	Mahanadi Basin	55.5	0.057	49.0	0.011	0.27	0.040	69	3.1	2.2	4622
14	Northern	52.5	0.076	48.8	0.021	0.26	0.066	65	0.6	0.5	1111
15	Southern	76.2	0.081	50.0	0.014	0.38	0.068	82	0.4	0.2	560
16	Dadra & Nagar Haveli	18.0	0.161	42.3	0.041	0.08	0.113	14	0.0	0.1	292

	State/ Region	Headcount Ratio (H)		Intensity of Poverty (A)		MPI		Rank of regions by MPI	Contribution to MPI (%)	Share of population (%)	N
		H (%)	SE	A (%)	SE	MPI value	SE				
17	Daman & DIU	25.1	0.078	41.1	0.105	0.10	0.053	24	0.0	0.0	258
18	Delhi	12.2	0.022	41.9	0.007	0.05	0.008	9	0.4	1.7	4533
19	Goa,	8.4	0.021	38.2	0.006	0.03	0.010	7	0.0	0.3	730
	Gujarat	34.7	0.044	45.1	0.007	0.156	0.012		4.0	4.9	9142
20	Kachchh	46.6	0.108	46.0	0.036	0.21	0.107	52	0.2	0.2	386
21	Plains Northern	25.5	0.038	42.3	0.008	0.11	0.021	26	1.1	1.9	3237
22	Saurashtra	40.9	0.069	45.0	0.007	0.18	0.035	44	1.1	1.2	2900
23	South Eastern	39.3	0.051	47.0	0.011	0.18	0.030	45	1.5	1.6	2619
	Haryana	**27.1**	**0.019**	**42.9**	**0.011**	**0.116**	**0.009**		**1.1**	**1.9**	**9307**
24	Eastern	28.7	0.031	43.1	0.013	0.12	0.016	32	0.8	1.2	6540
25	Western	24.3	0.041	42.3	0.003	0.10	0.017	23	0.4	0.7	2767
	Himachal Pradesh	**31.1**	**0.024**	**41.6**	**0.007**	**0.129**	**0.009**		**0.4**	**0.6**	**6586**
26	Central	31.7	0.024	40.9	0.004	0.13	0.012	34	0.2	0.3	3692
27	Trans Himalayan & Southern	30.1	0.045	42.9	0.011	0.13	0.020	33	0.2	0.2	2894
	Jammu & Kashmir	**27.6**	**0.019**	**42.4**	**0.009**	**0.117**	**0.011**		**0.7**	**1.2**	**4026**
28	Jhelum Valley	21.7	0.028	44.2	0.014	0.10	0.022	21	0.3	0.6	2383
29	Mountainous	14.4	0.031	39.5	0.010	0.06	0.013	10	0.1	0.4	1202
30	Outer Hills	61.7	0.082	41.8	0.013	0.26	0.038	66	0.3	0.2	441
	Jharkhand	**66.8**	**0.061**	**47.0**	**0.011**	**0.314**	**0.029**		**6.4**	**3.9**	**4358**
31	Hazaribag Plateau	59.8	0.078	46.9	0.010	0.28	0.061	73	2.1	1.5	1918
32	Ranchi Plateau	71.1	0.065	47.1	0.008	0.33	0.040	81	4.2	2.5	2440
	Karnataka	**37.2**	**0.017**	**43.3**	**0.002**	**0.161**	**0.006**		**4.3**	**5.2**	**17448**
33	Coastal and Ghats	21.5	0.050	41.5	0.006	0.09	0.029	19	0.2	0.5	1987
34	Inland Eastern	36.9	0.027	43.1	0.008	0.16	0.016	38	0.3	0.4	2353
35	Inland Northern	48.3	0.020	44.3	0.004	0.21	0.014	51	2.6	2.4	6731
36	Inland Southern	27.4	0.020	41.5	0.004	0.11	0.010	28	1.1	1.9	6377
	Kerala	**14.1**	**0.007**	**39.3**	**0.004**	**0.055**	**0.003**		**0.8**	**2.8**	**6495**
37	Northern	23.3	0.018	39.4	0.005	0.09	0.007	20	0.5	1.0	2225
38	Southern	9.2	0.008	39.1	0.004	0.04	0.004	8	0.3	1.8	4270

	State/ Region	Headcount Ratio (H)		Intensity of Poverty (A)		MPI		Rank of regions by MPI	Contribution to MPI (%)	Share of population (%)	N
		H (%)	SE	A (%)	SE	MPI value	SE				
	Madhya Pradesh	**53.7**	**0.031**	**46.3**	**0.005**	**0.248**	**0.017**		**6.9**	**5.4**	**15070**
39	Central	55.8	0.080	46.3	0.011	0.26	0.027	67	0.5	0.4	1160
40	Malwa	40.5	0.047	45.4	0.008	0.18	0.040	43	1.5	1.6	4420
41	Northern	54.7	0.065	43.5	0.008	0.24	0.036	60	0.9	0.8	2002
42	South	55.4	0.094	50.1	0.023	0.28	0.061	72	0.6	0.4	1274
43	South Western	61.3	0.061	48.2	0.023	0.30	0.035	77	1.3	0.9	2762
44	Vindhya	63.3	0.024	46.0	0.010	0.29	0.025	76	2.0	1.3	3452
	Maharashtra	**36.3**	**0.021**	**43.7**	**0.004**	**0.158**	**0.013**		**7.3**	**9.0**	**15501**
45	Coastal	7.4	0.031	41.2	0.018	0.03	0.016	6	0.3	2.0	2683
46	Eastern	52.1	0.055	45.6	0.014	0.24	0.049	59	0.8	0.6	1060
47	Inland Central	48.4	0.060	45.1	0.009	0.22	0.036	53	1.7	1.5	2454
48	Inland Eastern	41.7	0.029	43.5	0.011	0.18	0.026	42	1.6	1.7	2823
49	Inland Northern	51.0	0.055	44.8	0.011	0.23	0.047	57	1.1	0.9	1988
50	Inland Western	38.6	0.024	41.7	0.005	0.16	0.014	39	1.9	2.3	4493
51	Manipur	0.8	0.005	37.5	0.132	0.00	0.002	1	0.0	0.2	464
53	Meghalaya	33.3	0.138	42.0	0.030	0.14	0.082	35	0.2	0.2	529
52	Mizoram	3.6	0.053	45.6	0.118	0.02	0.019	2	0.0	0.1	338
54	Nagaland	21.1	0.065	46.5	0.059	0.10	0.055	22	0.1	0.2	501
	Odisha	60.6	0.030	48.6	0.006	0.295	0.016		5.3	3.5	9790
55	Coastal	56.4	0.063	48.6	0.014	0.27	0.050	70	1.9	1.4	3664
56	Northern	61.3	0.050	46.9	0.011	0.29	0.022	74	1.4	0.9	3412
57	Southern	65.0	0.051	49.8	0.008	0.32	0.024	79	2.0	1.2	2714
58	Pondicherry	7.2	0.042	38.6	0.011	0.03	0.024	5	0.0	0.2	413
	Punjab	**14.5**	**0.021**	**43.3**	**0.004**	**0.063**	**0.005**		**0.7**	**2.3**	**8395**
59	Northern	15.4	0.025	44.3	0.009	0.07	0.014	12	0.4	1.2	3995
60	Southern	13.6	0.024	42.0	0.007	0.06	0.013	11	0.3	1.1	4400
	Rajasthan	**55.8**	**0.040**	**47.6**	**0.004**	**0.266**	**0.016**		**7.8**	**5.7**	**14106**
61	North-Eastern	58.8	0.070	47.1	0.007	0.28	0.036	71	3.0	2.1	5251
62	Northern	56.6	0.043	47.7	0.007	0.27	0.027	68	1.8	1.3	3300

	State/ Region	Headcount Ratio (H)		Intensity of Poverty (A)		MPI		Rank of regions by MPI	Contribution to MPI (%)	Share of population (%)	N
		H (%)	SE	A (%)	SE	MPI value	SE				
63	South-Eastern	48.2	0.067	47.1	0.019	0.23	0.030	56	0.8	0.7	1763
64	Southern	57.5	0.078	50.4	0.022	0.29	0.103	75	0.7	0.5	961
65	Western	53.1	0.082	47.4	0.009	0.25	0.051	64	1.5	1.2	2831
66	Sikkim	44.6	0.096	44.7	0.010	0.20	0.035	49	0.1	0.1	498
	Tamil Nadu	**30.4**	**0.016**	**41.9**	**0.004**	**0.127**	**0.011**		**3.7**	**5.7**	**7434**
67	Coastal	40.9	0.043	40.4	0.003	0.17	0.020	40	1.1	1.3	1377
68	Coastal Northern	25.4	0.056	42.3	0.011	0.11	0.031	25	0.8	1.4	1967
69	Inland	28.0	0.029	42.4	0.004	0.12	0.016	30	0.7	1.2	1705
70	Southern	28.5	0.038	42.8	0.007	0.12	0.012	31	1.1	1.7	2385
71	Tripura	21.3	0.053	41.8	0.018	0.09	0.039	18	0.1	0.3	891
	Uttar Pradesh	**49.4**	**0.038**	**45.3**	**0.003**	**0.224**	**0.009**		**18.2**	**15.8**	**21265**
73	Central	50.2	0.063	45.2	0.009	0.23	0.031	55	3.1	2.7	2571
74	Eastern	54.5	0.032	44.8	0.004	0.24	0.026	62	9.8	7.8	9722
75	Northern Upper Ganga Plain	27.0	0.044	43.5	0.011	0.12	0.026	29	1.4	2.3	4794
76	Southern	66.1	0.154	50.4	0.034	0.33	0.093	80	1.4	0.8	768
77	Southern Upper Ganga Plains	47.7	0.060	46.1	0.011	0.22	0.032	54	2.5	2.2	3410
72	Uttarakhand	40.9	0.047	45.6	0.011	0.19	0.035	46	1.5	1.6	2311
	West Bengal	**42.8**	**0.021**	**46.1**	**0.005**	**0.198**	**0.012**		**7.6**	**7.5**	**10413**
78	Central Plains	43.4	0.038	44.1	0.005	0.19	0.027	48	1.8	1.8	2887
79	Eastern Plains	51.0	0.047	47.1	0.005	0.24	0.016	61	3.8	3.0	3605
80	Himalayan	51.4	0.035	47.8	0.011	0.25	0.027	63	1.4	1.1	1363
81	Southern Plains	20.3	0.031	43.8	0.008	0.09	0.014	17	0.7	1.5	2379
82	Western Plains	18.4	0.144	38.6	0.200	0.07	0.071	13	0.0	0.1	179

Table A.2: Decomposition of Multidimensional Poverty Index by Dimensions and Indicators in States and Regions of India, 2004–05

		Education		Economic		Health		Household Environment		MPI
Sl No	**State/Region**	**School enrol-ment**	**Years of school-ing**	**Con-sump-tion poor**	**Job inse-cu-rity**	**Health insur-ance**	**Under Weight-ing**	**Wa-ter**	**Sani-ta-tion**	
	INDIA	**3.2**	**7.6**	**11.5**	**10.5**	**27.0**	**8.7**	**5.2**	**26.4**	**0.194**
	(undivided) Andhra Pradesh	**1.9**	**9.7**	**3.3**	**16.2**	**29.4**	**8.2**	**4.5**	**26.7**	**0.153**
1	Coastal Northern	2.3	9.5	3.9	13.5	30.2	6.8	8.5	25.4	0.09
2	Coastal southern	1.9	10.9	1.2	16.0	30.4	6.1	8.7	24.9	0.17
3	Inland North Eastern	1.9	8.1	0.7	20.2	29.8	9.2	2.0	28.1	0.19
4	Inland North Western	1.9	10.7	3.6	16.4	28.3	8.7	3.5	26.9	0.16
5	Inland Southern	1.8	9.2	7.8	12.7	29.5	8.7	3.4	26.8	0.15
6	**Arunachal Pradesh**	**2.3**	**10.5**	**11.0**	**11.7**	**30.5**	**7.9**	**1.3**	**24.7**	**0.11**
	Assam	**4.2**	**6.3**	**17.3**	**10.3**	**29.1**	**4.5**	**1.6**	**26.6**	**0.189**
7	Cachar Plain	14.6	8.3	8.3	10.4	33.3	0.0	0.0	25.0	0.02
8	Plains Eastern	6.4	5.1	5.5	14.8	30.4	8.0	3.4	26.4	0.08
9	Plains Western	4.1	6.4	17.9	10.1	29.0	4.4	1.5	26.6	0.21
	Bihar	**4.8**	**10.9**	**12.6**	**13.3**	**23.1**	**8.1**	**0.8**	**26.3**	**0.271**
10	Central	4.7	8.8	15.8	11.6	24.4	7.7	1.8	25.2	0.23
11	Northern	4.9	12.3	10.5	14.4	22.3	8.3	0.2	27.1	0.31
12	**Chandigarh**	**0.0**	**16.7**	**0.0**	**2.1**	**33.3**	**16.7**	**0.0**	**31.3**	**0.02**
	Chhattisgarh	**1.8**	**5.9**	**16.4**	**12.8**	**22.5**	**10.0**	**5.2**	**25.5**	**0.278**
13	Mahanadi Basin	1.8	5.8	16.3	13.2	22.5	9.5	4.5	26.2	0.27
14	Northern	1.8	6.6	17.4	12.9	21.9	9.8	8.1	21.7	0.26
15	Southern	1.8	5.3	15.2	9.9	23.2	13.9	5.4	25.4	0.38
16	**Dadra & Nagar Haveli**	**2.5**	**0.9**	**4.9**	**3.0**	**30.4**	**24.1**	**8.2**	**26.0**	**0.08**
17	**Daman & DIU**	**1.3**	**7.9**	**0.8**	**5.9**	**30.9**	**9.0**	**14.0**	**30.1**	**0.10**
18	**Delhi**	**3.2**	**5.1**	**16.0**	**10.3**	**29.6**	**7.8**	**7.2**	**20.8**	**0.05**

		Education		Economic		Health		Household Environment		MPI
Sl No	**State/Region**	**School enrol-ment**	**Years of school-ing**	**Con-sump-tion poor**	**Job inse-cu-rity**	**Health insur-ance**	**Under Weight-ing**	**Wa-ter**	**Sani-ta-tion**	
19	**Goa**	**0.0**	**1.7**	**4.6**	**22.8**	**32.9**	**0.9**	**5.4**	**31.6**	**0.03**
	Gujarat	**4.1**	**6.8**	**8.8**	**8.4**	**27.9**	**12.0**	**5.9**	**26.1**	**0.156**
20	Kachchh	7.3	9.8	4.5	8.1	28.4	9.8	4.8	27.4	0.21
21	Plains Northern	5.0	5.2	7.1	7.1	30.1	15.7	2.9	26.9	0.11
22	Saurashtra	5.1	7.4	6.1	5.5	28.8	5.8	13.9	27.4	0.18
23	South Eastern	2.3	7.3	12.7	11.5	25.6	14.1	2.2	24.2	0.18
	Haryana	**2.2**	**6.9**	**13.3**	**12.2**	**29.6**	**8.2**	**3.1**	**24.4**	**0.116**
24	Eastern	3.0	8.1	14.9	10.3	29.4	6.1	3.1	25.1	0.12
25	Western	0.6	4.6	10.1	15.9	30.1	12.4	3.3	23.1	0.10
	Himachal Pradesh	**0.4**	**3.8**	**11.4**	**11.0**	**28.6**	**10.0**	**6.3**	**28.4**	**0.129**
26	Central	0.1	3.4	11.8	12.1	30.6	10.5	2.4	29.1	0.13
27	Trans Himalayan &Southern	0.9	4.5	10.8	9.3	25.6	9.4	12.3	27.3	0.13
	Jammu & Kashmir	**3.2**	**4.4**	**1.0**	**8.4**	**30.5**	**7.8**	**15.6**	**29.2**	**0.117**
28	Jhelum Valley	7.5	5.9	2.4	13.0	29.4	6.1	8.3	27.5	0.10
29	Mountainous	0.4	9.2	0.4	5.4	32.1	11.3	11.7	29.6	0.06
30	Outer Hills	0.3	1.4	0.0	5.2	30.9	8.2	23.5	30.6	0.26
	Jharkhand	**1.9**	**6.6**	**12.3**	**9.3**	**27.4**	**8.3**	**7.5**	**26.6**	**0.314**
31	Hazaribag Plateau	2.4	5.5	11.7	5.1	26.6	12.4	9.2	27.2	0.28
32	Ranchi Plateau	1.7	7.1	12.7	11.4	27.9	6.3	6.7	26.3	0.33
	Karnataka	**3.2**	**6.8**	**12.4**	**6.1**	**29.3**	**7.8**	**6.5**	**27.9**	**0.161**
33	Coastal and Ghats	0.3	1.7	7.9	6.8	29.2	11.2	23.8	19.2	0.09
34	Inland Eastern	1.9	6.8	8.2	9.7	28.5	8.3	10.5	26.1	0.16
35	Inland Northern	3.9	7.2	14.7	4.6	28.9	6.3	5.8	28.6	0.21
36	Inland Southern	2.5	7.1	9.5	8.0	30.6	10.1	3.5	28.8	0.11
	Kerala	**0.6**	**1.9**	**7.0**	**19.5**	**29.3**	**4.3**	**29.1**	**8.3**	**0.055**
37	Northern	0.8	0.6	5.4	21.1	29.9	4.6	31.4	6.3	0.09
38	Southern	0.4	3.6	9.2	17.5	28.5	3.9	26.0	11.0	0.04

Sl No	State/Region	Education		Economic		Health		Household Environment		MPI
		School enrol-ment	Years of school-ing	Con-sump-tion poor	Job inse-cu-rity	Health insur-ance	Under Weight-ing	Wa-ter	Sani-ta-tion	
	Madhya Pradesh	**2.1**	**6.7**	**10.5**	**8.4**	**25.7**	**10.6**	**8.9**	**27.0**	**0.248**
39	Central	2.1	4.9	12.0	7.0	28.3	7.5	10.3	27.9	0.26
40	Malwa	3.7	8.0	9.2	5.2	24.9	11.3	11.2	26.4	0.18
41	Northern	2.4	6.3	6.0	10.0	29.5	14.8	1.5	29.5	0.24
42	South	0.8	6.2	16.8	12.0	24.1	9.1	6.0	25.0	0.28
43	South Western	1.7	7.1	14.7	11.2	23.6	9.7	6.1	25.8	0.30
44	Vindhya	1.2	6.2	9.2	7.5	25.6	9.8	13.0	27.4	0.29
	Maharashtra	**2.5**	**4.1**	**14.1**	**8.1**	**29.2**	**9.5**	**5.7**	**26.8**	**0.158**
45	Coastal	2.6	2.7	10.5	17.2	30.9	10.5	1.9	23.6	0.03
46	Eastern	1.1	3.0	13.9	7.4	27.6	11.3	10.8	25.1	0.24
47	Inland Central	2.9	5.0	11.8	4.6	28.9	11.1	7.9	27.7	0.22
48	Inland Eastern	3.2	4.5	19.9	7.5	28.2	8.5	2.7	25.5	0.18
49	Inland Northern	2.7	3.8	15.8	7.1	29.0	12.3	1.8	27.5	0.23
50	Inland Western	2.2	3.8	10.9	11.0	30.7	6.5	7.1	27.8	0.16
51	**Manipur**	**0.0**	**33.3**	**0.0**	**0.0**	**33.3**	**0.0**	**0.0**	**33.3**	**0.00**
53	**Meghalaya**	**6.2**	**3.8**	**13.3**	**9.8**	**30.6**	**7.7**	**6.5**	**22.1**	**0.14**
52	**Mizoram**	**0.0**	**3.9**	**24.0**	**10.3**	**27.9**	**5.9**	**3.9**	**24.0**	**0.02**
54	**Nagaland**	**5.8**	**0.3**	**6.9**	**24.9**	**28.6**	**8.0**	**0.0**	**25.6**	**0.10**
	Odisha	**2.0**	**5.4**	**13.8**	**10.8**	**26.9**	**7.3**	**7.2**	**26.7**	**0.295**
55	Coastal	1.4	2.1	13.2	10.6	26.9	9.1	10.5	26.3	0.27
56	Northern	2.5	4.4	14.7	9.1	27.4	6.9	7.4	27.6	0.29
57	Southern	2.3	9.4	13.7	12.2	26.5	5.9	3.7	26.4	0.32
58	Pondicherry	0.0	6.2	26.8	4.8	28.0	1.7	0.0	32.6	0.03
	Punjab	**3.9**	**11.5**	**11.8**	**7.4**	**29.7**	**8.3**	**2.8**	**24.6**	**0.063**
59	Northern	3.6	8.5	15.3	8.7	29.5	5.9	3.6	24.9	0.07
60	Southern	4.1	15.1	7.7	5.7	30.0	11.2	2.0	24.2	0.06
	Rajasthan	**4.2**	**7.7**	**7.9**	**9.7**	**27.5**	**9.2**	**8.6**	**25.2**	**0.266**

Sl No	State/Region	Education		Economic		Health		Household Environment		MPI
		School enrol-ment	**Years of school-ing**	**Con-sump-tion poor**	**Job inse-cu-rity**	**Health insur-ance**	**Under Weight-ing**	**Wa-ter**	**Sani-ta-tion**	
61	North-Eastern	3.4	6.1	8.2	11.8	27.6	9.1	8.1	25.7	0.28
62	Northern	3.5	7.2	6.9	10.7	27.7	8.4	12.2	23.5	0.27
63	South-Eastern	4.1	10.2	8.6	6.4	27.8	10.9	6.5	25.7	0.23
64	Southern	5.1	11.6	9.5	7.4	26.3	10.5	3.8	25.8	0.29
65	Western	6.2	8.6	7.2	7.3	27.5	8.8	8.6	25.8	0.25
66	Sikkim	0.1	5.0	8.8	4.0	29.5	3.0	28.3	21.2	0.20
	Tamil Nadu	**1.2**	**7.4**	**11.6**	**9.3**	**30.4**	**6.4**	**5.7**	**27.9**	**0.127**
67	Coastal	1.5	7.2	9.6	8.3	31.1	6.1	5.5	30.6	0.17
68	Coastal Northern	0.6	8.4	14.0	7.1	29.8	5.7	4.9	29.5	0.11
69	Inland	1.7	9.8	9.1	10.2	30.2	7.6	2.6	28.8	0.12
70	Southern	1.1	5.1	13.8	11.3	30.1	6.5	8.8	23.3	0.12
71	Tripura	1.7	4.3	13.3	11.5	30.9	4.6	8.1	25.5	0.09
	Uttar Pradesh	**4.8**	**7.4**	**11.4**	**11.5**	**25.7**	**9.8**	**2.3**	**27.1**	**0.224**
73	Central	4.2	6.3	11.6	12.1	25.4	11.5	1.0	27.9	0.23
74	Eastern	4.3	6.7	11.0	12.3	26.0	9.0	2.5	28.2	0.24
75	Northern upper Ganga Plain	10.5	12.4	8.8	4.9	29.0	10.5	2.1	21.7	0.12
76	Southern	4.1	5.9	19.6	16.3	20.2	5.6	2.9	25.5	0.33
77	Southern Upper Ganga Plains	4.4	9.3	10.0	9.1	25.6	12.9	2.7	26.0	0.22
72	Uttarakhand	1.4	2.8	14.4	9.1	26.1	10.2	10.2	25.9	0.19
	West Bengal	**2.3**	**13.1**	**12.8**	**7.9**	**27.9**	**6.1**	**3.4**	**26.4**	**0.198**
78	Central Plains	1.2	8.6	13.5	10.1	28.8	7.3	1.6	29.0	0.19
79	Eastern Plains	3.0	17.7	11.5	7.6	27.6	5.7	1.2	25.7	0.24
80	Himalayan	2.4	8.1	15.0	3.8	26.4	5.2	13.8	25.3	0.25
81	Southern Plains	1.7	11.9	13.2	11.8	29.8	6.1	0.2	25.4	0.09
82	Western Plains	0.0	3.0	11.4	4.0	32.6	18.4	0.0	30.6	0.07