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Multidimensional Poverty Reduction in India 1999-2006: Slower Progress for the Poorest Groups

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Multidimensional poverty in India decreased between 1999 and 2006 faster than income poverty. Using the National Family Health Survey (NFHS) datasets, this briefing describes the extent of poverty reduction, and examines where and how it has taken place.

To measure changes rigorously, we create an adaptation of the global Multidimensional Poverty Index (MPI) proposed by Alkire and Santos (2010) and reported by UNDP's *Human Development Reports* since 2010. This was done to compare poverty estimates, using the NFHS datasets for 1998/9 and 2005/6 (hereon 1999 and 2006, as the data collection took place mainly in those years). We refer to this comparable MPI as the **MPI_I (the MPI for India)**. Note that data limitations in 1999 mean that the MPI_I estimates are lower than the global MPI estimates for India.

India's reduction in multidimensional poverty was over 50% higher than its reduction of income poverty. This finding – which compares MPI trends with income poverty trends 1993/4 to 2004/5 as reported by the Tendulkar Committee – is true for the percentage of multidimensionally poor people, whether in absolute or in relative terms. By absolute, we mean the difference in the proportion of poor, and by relative, we mean the difference in the proportion of poor relative to the initial proportion in 1999.

Analysing MPI_I trends enables us to see where and how the changes in poverty have occurred, and demonstrates the range of insights dynamic multidimensional poverty analyses generate.[1]

About the MPI

Table 1 introduces the dimensions, indicators, weights and definitions of deprivation. A person is identified as poor if his or her deprivation score is equal to or larger than one third. The deprivation score of each person is calculated by summing their weighted deprivations, where each dimension is equally weighted and indicators within it are also equally weighted, as reported in Table 1. For example, if a person is deprived in nutrition, schooling, and water only, the deprivation score is 1/6 + 1/6 + 1/18 = 7/18, which is larger than one-third, and the person is identified as poor.

Table 1: Dimensions, Indicators, Deprivation Cut-offs and Weights for the MPI_I

Dimension (Weight)	Indicator (Weight)	A household is deprived if...
Education (1/3)	Schooling (1/6)	No household member has completed five years of schooling
	Attendance (1/6)	Any school-aged child (6-14) is not attending school in the academic year of study
Health (1/3)	Nutrition (1/6)	Any ever-married woman has a BMI lower than 18.5 kg/m^2, or any child under 36 months of age has a weight-for-age z-score more than two standard deviations below the mean z-score.
	Child Mortality (1/6)	Any child under the age of five of an ever-married woman has died
Standard of Living (1/3)	Electricity (1/18)	The household has no access to electricity
	Sanitation (1/18)	The sanitation facility is not improved, or it is shared with other households
	Water (1/18)	Household members do not have access to safe drinking water, or safe water is more than a 30-minute walk, round trip
	Housing (1/18)	Household members live in a kaccha house; or in a semi-pucca house and own less than five acres of unirrigated land or less than 2.5 acres of irrigated land[2]
	Cooking fuel (1/18)	The household mainly cooks with charcoal, crop residue, animal dung, wood, or straw/shrubs/grass
	Assets (1/18)	The household owns no more than one of: radio, TV, telephone, bike, motorbike or refrigerator, and it does not own a car or truck

Source: Alkire and Seth (2013)

The MPI_I is the product of two numbers: the incidence or headcount ratio (H), (the percentage of people identified as poor), and the average intensity of deprivation (A), which reflects the share of deprivations each poor person experiences on average. So, $MPI_I = H \times A$.

Main Results

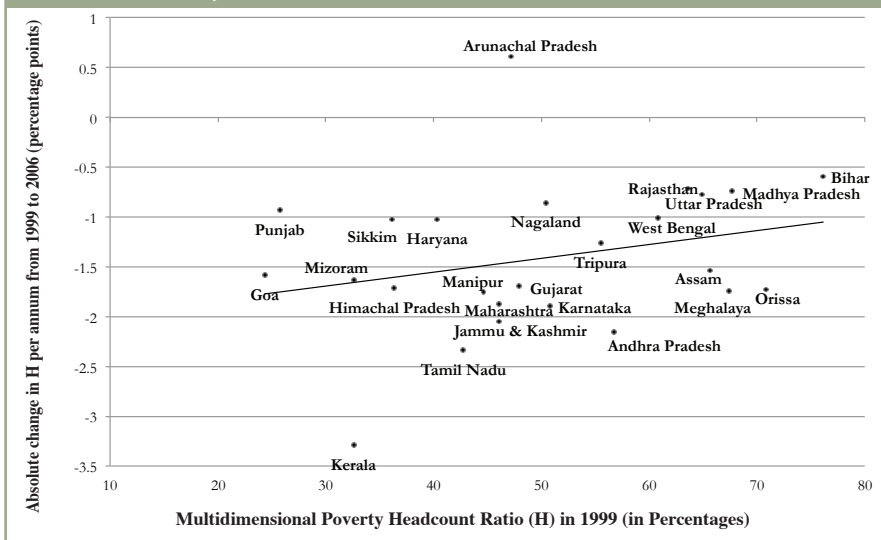
Between 1999 and 2006, the MPI_I in India decreased by 0.050 units or by 16%, from 0.300 to 0.251 (see Table 2). This reduction is mainly due to a statistically significant reduction in H, the percentage of people identified as poor, which fell more than 1 percentage point per year in absolute terms. The reduction in A, the intensity, was smaller but still statistically significant.

The reduction in India's MPI has been positive, but at 1.2 percentage points per year, progress has been made at less than a third of the speed of some of its neighbours, which are significantly poorer in terms of income. For example, Nepal reduced the percentage of poor people from 64.7% to 44.2% between 2006 and 2011, 4.1 percentage points per year, while Bangladesh's poverty rates decreased by 3.2 percentage points per year, and the average intensity of poverty also diminished.

Where and among which groups has poverty been reduced?

The reduction in national MPI_I has not been uniform across different groups.

Figure 1: Change in the Multidimensional Poverty Headcount Ratio and Change in the Income Poverty Headcount Ratio



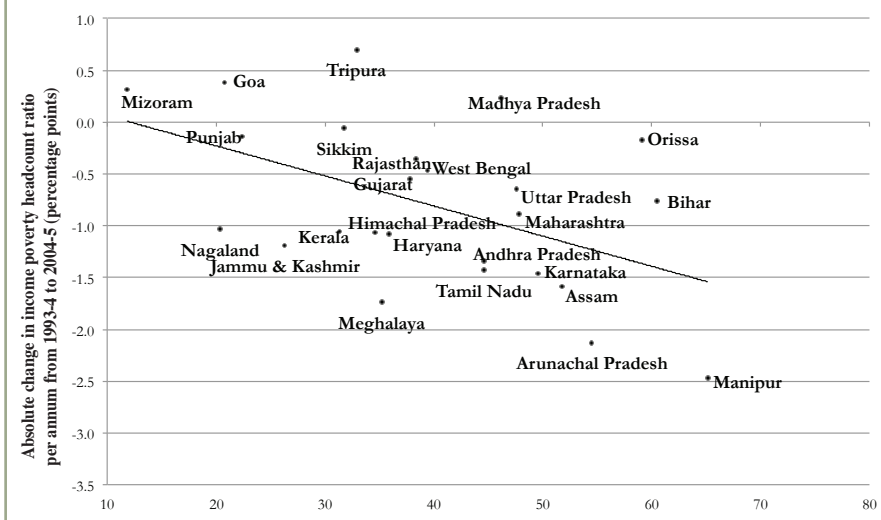


Table 3 (next page) decomposes trends according to rural/urban areas, states, castes/tribes, religions and various household characteristics. In general, the groups that were poorer in 1999 improved least over the seven-year period.

States

Reduction in poverty varied widely across 25 states,[3] with 17 states achieving statistically significant reductions in MPI_I and H. In a stunning performance, Kerala reduced the percentage of poor people from 32.6% to 9.5% in only six years. Kerala made large improvements in all indicators except cooking fuel, with the most notable improvements taking place in sanitation, water and electricity. The reduction in overall poverty, MPI_I, was greatest for Andhra Pradesh, which not only reduced its headcount ratio by 15 percentage points, from 56.7% to 41.6%, but also reduced the average intensity of poverty experienced by each poor person by the equivalent of one standard-of-living indicator. Despite this good news, even India's best-performing states – Kerala and Andhra Pradesh – progressed just over half as fast as Nepal or Bangladesh.

Table 2: Change in Poverty

	1999	2006	Change
MPI_I	0.300	0.251	-0.050*
H	56.8%	48.5%	-8.3%*
A	52.9%	51.7%	-1.2%*

Source: Alkire and Seth (2013)

**Statistically significant change with respect to 95% confidence intervals*

States that did not show statistically significant reductions in poverty include Arunachal Pradesh, Bihar, Haryana Meghalaya, Nagaland, Rajasthan, Sikkim, and Tripura. States such as Bihar, Madhya Pradesh, Rajasthan, Uttar Pradesh, and West Bengal, where more than 60% of the population were MPI_I poor in 1999, showed relatively small reductions in poverty headcount ratio. West Bengal, the least poor among them in 1999, had the biggest reduction of 7.2 percentage points. In contrast, four less-poor South Indian states – Andhra Pradesh, Karnataka, Kerala, and Tamil Nadu – reduced H by more than 13 percentage points each in absolute terms.

As shown by the upward trend line in the upper diagram of Figure 1, states that were poorer in 1999 reduced multidimensional poverty the least. This trend is the opposite of the pattern of income poverty reduction across states between 1993/4 and 2004/5, depicted in the lower diagram in Figure 1. The state income poverty estimates obtained from the Tendulkar Committee Report (GoI 2009) show that the poorer states in 1993/4 reduced income poverty more.

Urban/Rural Areas

Reductions in MPI_I and H in both rural and urban areas are statistically significant. Rural areas as a whole have registered greater reductions in both H and A, and indeed a much larger reduction in MPI_I. Although urban/rural disparity in multidimensional poverty has decreased, it is much larger than the urban/rural differences in income poverty.[4]

How has poverty been reduced?

Multidimensional poverty has gone down nationally, but reduction patterns vary across groups. It is interesting to see: (1) the indicators that have been responsible for the overall change, and (2) whether the reduction in poverty has benefitted the poorest of the poor.

Which indicators caused the reduction in poverty?

An interesting property of the MPI_I is that it can be broken down to understand which indicators are contributing to poverty. The MPI is the weighted average of what we call 'censored headcount ratios' (CH) of each indicator. The CH is the percentage of people who are poor and also deprived in that indicator. It can be seen from Figure 2 (see page 4) that the reductions in standard-of-living deprivations have been larger than reductions of deprivations in education and health. It is important to note at this stage that a 1% reduction in a nutritional deprivation will result in a higher reduction in poverty than a 1% reduction in a living standard indicator. This is because the relative weights on health and education indicators are three times higher than on standard-of-living indicators.

HAVE THE POOREST OF THE POOR BENEFITTED?

In order to understand how the poorest of the poor have fared, we consider more stringent or ultra deprivation cut-offs for all indicators except electricity, as described in Table 4. A person is identified as deeply poor if their deprivation score based on the ultra deprivation cut-offs is one-third or more. As with the MPI_1, a person's deprivation score is the weighted sum of the deprivations he or she experiences.

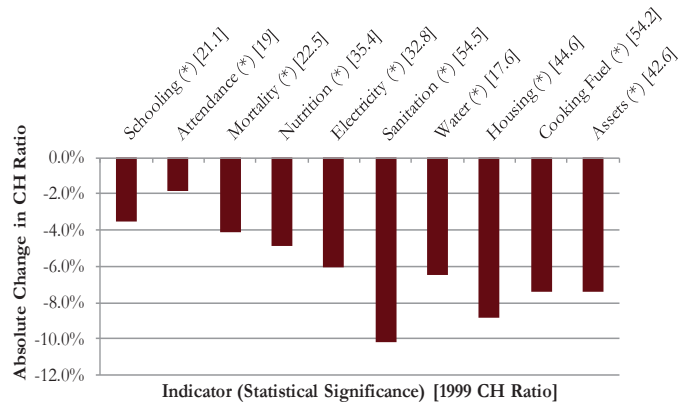
Nearly half of all poor people in India were also deeply poor in 1999: 26.4% of people. The share of deeply poor decreased from 26.4% in 1999 to 19.3% in 2006. The share of MPI_1 poor who were also deeply poor also decreased, from

Table 3: Changes in Poverty across Geographic and Social Groups and Household Characteristics

	1999				2006				Change	
Rural/Urban	**Pop. Share**	**MPI_1**	***H***	***A***	**Pop. Share**	**MPI_1**	***H***	***A***	**MPI_1**	***H***
Rural	73.3%	0.368	68.6%	53.6%	69.4%	0.319	60.8%	52.4%	-0.049*	-7.8%*
Urban	26.7%	0.116	24.4%	47.4%	30.6%	0.096	20.5%	46.9%	-0.020*	-4.0%*
States										
Andhra Pradesh	8.3%	0.299	56.7%	52.7%	7.1%	0.194	41.6%	46.6%	-0.105*	-15.1%*
Arunachal Pradesh	0.1%	0.226	47.2%	47.8%	0.1%	0.260	51.5%	50.6%	0.035	4.3%
Assam	2.5%	0.345	65.7%	52.5%	2.7%	0.285	54.9%	51.9%	-0.060*	-10.8%*
Bihar	10.4%	0.442	76.1%	58.1%	10.7%	0.416	72.0%	57.8%	-0.026	-4.1%
Goa	0.1%	0.112	24.4%	45.8%	0.1%	0.057	13.2%	42.8%	-0.055*	-11.1%*
Gujarat	4.9%	0.248	47.9%	51.8%	4.9%	0.175	36.0%	48.6%	-0.073*	-11.9%*
Haryana	2.1%	0.190	40.3%	47.2%	1.9%	0.154	33.1%	46.5%	-0.036	-7.2%
Himachal Pradesh	0.6%	0.154	36.3%	42.4%	0.6%	0.100	24.3%	41.2%	-0.054*	-12.0%*
Jammu & Kashmir	0.9%	0.226	46.0%	49.2%	0.9%	0.146	31.7%	46.2%	-0.080*	-14.3%*
Karnataka	5.3%	0.255	50.8%	50.3%	5.5%	0.173	37.5%	46.2%	-0.082*	-13.3%*
Kerala	3.3%	0.136	32.6%	41.7%	2.6%	0.038	9.5%	39.9%	-0.098*	-23.0%*
Madhya Pradesh	8.3%	0.368	67.6%	54.5%	8.7%	0.329	62.4%	52.6%	-0.040*	-5.2%*
Maharashtra	9.7%	0.226	46.0%	49.1%	9.2%	0.155	32.9%	47.0%	-0.071*	-13.1%*
Manipur	0.2%	0.212	44.6%	47.6%	0.2%	0.148	32.4%	45.7%	-0.065*	-12.2%*
Meghalaya	0.2%	0.358	67.4%	53.2%	0.3%	0.297	55.2%	53.9%	-0.061	-12.2%*
Mizoram	0.1%	0.155	32.6%	47.5%	0.1%	0.094	21.1%	44.2%	-0.061*	-11.5%*
Nagaland	0.2%	0.246	50.4%	48.8%	0.1%	0.218	44.4%	49.1%	-0.028	-6.0%
Orissa	3.8%	0.381	70.8%	53.8%	3.7%	0.309	58.7%	52.6%	-0.072*	-12.1%*
Punjab	2.4%	0.117	25.7%	45.6%	2.5%	0.088	19.2%	45.8%	-0.029*	-6.5%*
Rajasthan	5.3%	0.341	63.5%	53.7%	5.9%	0.310	58.5%	53.0%	-0.031	-5.0%
Sikkim	0.0%	0.173	36.1%	48.0%	0.1%	0.132	28.9%	45.6%	-0.041	-7.2%
Tamil Nadu	6.6%	0.195	42.8%	45.6%	5.4%	0.110	26.4%	41.7%	-0.085*	-16.4%*
Tripura	0.4%	0.276	55.5%	49.7%	0.3%	0.226	46.6%	48.6%	-0.049	-8.9%
Uttar Pradesh	14.7%	0.348	64.9%	53.6%	17.2%	0.314	59.5%	52.8%	-0.034*	-5.4%*
West Bengal	8.3%	0.339	60.8%	55.7%	7.9%	0.283	53.8%	52.6%	-0.055*	-7.1%*
Castes/Tribes										
Scheduled Castes	18.3%	0.378	68.8%	55.0%	19.1%	0.307	58.3%	52.6%	-0.071*	-10.5%*
Scheduled Tribes	8.9%	0.458	80.3%	57.0%	8.5%	0.417	74.0%	56.3%	-0.041*	-6.3%*
Other Backward Classes	32.6%	0.301	57.9%	52.1%	40.2%	0.258	50.8%	50.8%	-0.043*	-7.1%*
General	40.1%	0.229	45.2%	50.6%	32.2%	0.164	33.0%	49.7%	-0.065*	-12.2%*
Religion										
Hindu	80.8%	0.306	57.9%	52.8%	80.4%	0.249	48.6%	51.2%	-0.057*	-9.3%*
Muslim	13.2%	0.320	59.0%	54.3%	14.1%	0.301	54.8%	55.0%	-0.019	-4.3%
Christian	2.6%	0.196	40.5%	48.3%	2.3%	0.158	32.3%	49.0%	-0.038	-8.3%*
Sikh	1.8%	0.115	25.9%	44.6%	1.7%	0.078	17.5%	44.5%	-0.038*	-8.4%*
Other Religions	1.5%	0.222	42.7%	51.9%	1.6%	0.221	42.8%	51.8%	0.000	0.0%
Head's Gender										
Female	7.6%	0.275	52.9%	52.0%	10.8%	0.278	52.3%	53.1%	0.003	-0.5%
Male	92.4%	0.302	57.1%	52.9%	89.2%	0.247	48.0%	51.5%	-0.055*	-9.1%*
Head's Education										
No Education	37.4%	0.448	78.4%	57.1%	37.8%	0.398	71.6%	55.6%	-0.050*	-6.8%*
1-5 Years	22.7%	0.310	60.9%	50.9%	18.9%	0.249	50.8%	49.1%	-0.060*	-10.1%*
6-10 Years	27.9%	0.188	40.9%	46.1%	29.5%	0.151	33.2%	45.4%	-0.037*	-7.7%*
11-12 Years	5.3%	0.114	25.5%	44.7%	6.0%	0.092	21.0%	43.8%	-0.022*	-4.5%*
12 Years or More	6.6%	0.055	12.9%	42.8%	7.9%	0.041	9.9%	41.3%	-0.015*	-3.1%*
Household Size										
1-3 Members	10.2%	0.248	50.9%	48.7%	14.6%	0.194	41.1%	47.1%	-0.054*	-9.8%*
4-5 Members	31.6%	0.265	50.7%	52.3%	36.0%	0.213	42.0%	50.6%	-0.053*	-8.8%*
6-7 Members	28.4%	0.321	59.0%	54.5%	26.6%	0.285	53.2%	53.6%	-0.036*	-5.8%*
8-9 members	14.2%	0.340	62.2%	54.6%	12.3%	0.318	58.8%	54.2%	-0.021*	-3.4%*
10 or More Members	15.5%	0.332	64.2%	51.7%	10.4%	0.292	57.0%	51.3%	-0.040*	-7.2%*

**Statistically signifcant change with respect to 95% confidence intervals*

Figure 2: Change in Deprivations among the Poor



46.5% in 1999 to 39.8% in 2006. Thus, the reduction in overall headcount ratio has been obtained largely by reducing the percentage of people who are deeply poor. However, nearly a fifth of the Indian population – more than 200 million people – were still deeply poor in 2006.

Conclusion

In sum, from 1999-2006 India reduced multidimensional poverty significantly, achieving significant reductions in each of the ten indicators, with the biggest improvements seen in access to electricity, housing conditions, access to safe drinking water and improved sanitation facilities.

Strong reductions were apparent among less-poor states, like Andhra Pradesh, but also among certain poor groups, like Scheduled Castes and households whose heads had only 1-5 years of education.

However the very poorest groups – Scheduled Tribes, Muslims, female-headed households, households whose head had no education, and the poorest states – saw slower reductions in poverty. This is disturbing, and contrasts sharply with trends in income poverty reduction from 1993/4 to 2004/5 across states. Still, an analysis across the deeply poor shows that the most grinding and extreme levels of poverty reduced slightly faster than the national average.

Unfortunately, it is not possible to update this briefing to celebrate more recent progress, because the NFHS survey has not been repeated; nor do the National Sample Survey datasets include the required questions. However, these data constraints are not insurmountable: the global MPI uses a fraction of the questions in most Demographic and Health Surveys, such as the NFHS; just 39 out of 365 questions, in fact.

We hope it will become possible at some point to analyse how India has reduced multidimensional poverty in the period since 2006. In the meantime, we direct interested readers to OPHI Working Paper 60, 'Multidimensional Poverty Reduction in India between 1999 and 2006: Where and How?', for a more detailed examination of poverty reduction in the period covered here.

Notes

1. We use the MPI_1 not because this particular set of indicators and cut-offs are the best parameters for India, but because it enables us to compare India's progress with that of other countries (Alkire and Roche 2013).

2. 'Pucca' houses are built entirely of high-quality materials; 'semi-pucca' houses are built partly with high-quality materials and partly with low-quality materials; and 'kaccha' houses are built with low-quality materials throughout.

3. We have combined Bihar with Jharkhand, Madhya Pradesh with Chhattisgarh, and Uttar Pradesh with Uttarakhand, as these three new states did not exist in 1999. Delhi is included in national and urban/rural analyses of MPI_1 in India, but it is not reported as a state because it is technically a union territory.

4. For urban/rural estimates of income poverty and change over time, see GoI (2009).

Table 4: Ultra Deprivation Cut-offs of Ten Indicators

Indicator	A household is deprived if…
Schooling	No household member has completed even one year of schooling
Attendance	No school-aged child (6-14) in the household is attending school in the academic year of study
Nutrition	Any ever-married woman has a BMI lower than 17 kg/m^2, or any child under 36 months has a weight-for-age z-score more than three standard deviations below the mean z-score
Mortality	Two or more children under the age of five of an ever-married woman have died in the household
Electricity	The household has no electricity
Sanitation	Members of the household have no toilet and use bush or field for sanitation (open defecation)
Water	The drinking water source is unprotected and more than a 45-minute walk, round trip
Housing	The household resides in a kaccha house
Cooking fuel	The household mainly cooks with wood or straw/shrubs/grass
Assets	The household does not own even one of: radio, TV, telephone, bike, motorbike or refrigerator, and does not own a car or truck

Source: Alkire and Seth (2013)

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