

India's 'Poverty of Numbers'

Revisiting Measurement Issues

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The number of "poor" derived by applying price adjustment to an old consumption basket, which is largely what official poverty measures have done, are very different from estimates based on actual consumption baskets that have changed over time. For instance, the share of cereals in household expenditure halved between 1993–94 and 2011–12 in rural areas. In the light of this, we ask if all expenditure would be on food, what percentage of the population would be unable to meet the prescribed calorie requirement? Adding a "minimum" level of expenditure on clothing–bedding–footwear, fuel and light, and conveyance to the "derived" sum of food expenditure provides a second counterfactual. Similarly, the cumulative addition of expenditure on other consumer goods and services provides further counterfactual scenarios.

Poverty estimates in India have largely relied on applying a price adjustment procedure to a consumption basket that was recommended by an official government task force in 1973–74. However, the consumption basket of households has changed over time, attributable to a range of factors including changes in the relative price of consumables, evolving preferences, less arduous work, better health, and a decline in availability of public goods, especially education and health facilities. Given that food baskets may have changed in favour of non-cereal food items and further that there may be an increasing importance of non-food items in total household expenditure, calorie intake may have changed over time. Therefore, any estimation of calorie-based poverty must account for changes in actual consumption.

A review of literature suggests an increasing divergence between poverty estimates based on the nutrition-invariant poverty lines—wherein those consuming less than 2,200 calories are categorised as poor—and the official poverty estimates. While the former show a dramatic increase in the proportion of the rural poor, the official numbers show a decline between 1993–94 and 2011–12. Given that both sets of estimates are based on the National Sample Survey Office (NSSO) surveys on consumption expenditure, this does raise serious concerns about their validity.

In light of this, the objective of the paper is to revisit the estimation of poverty in India. In doing so, it carries out an item-wise analysis of changing consumption baskets and provides a series of counterfactual scenarios that underlie a new approach of using household expenditure data to estimate poverty. The scope of the paper is limited to analysing household consumption in 1993–94, 2004–05 and 2011–12 for rural areas, as measured by surveys carried out by the NSSO.

Tracing the Steps of Measurement

The erstwhile Planning Commission had been estimating poverty since the 1960s. However, the methodology for estimation has been revised periodically in order to address emerging anomalies. These estimates of poverty, both rural and urban, have to be comparable over geographical space and time. The first estimates of poverty in 1962 were based on a consumption basket that would meet minimum calorie requirement for survival. In 1977, a task force defined the poverty line in terms of the monetary equivalent of a consumption basket that provided 2,400 calories per capita per day in rural areas, as recommended by the Indian Council of Medical Research (ICMR). It was derived from household consumption

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data collected by the NSSO. This exercise was first done based on data for 1973–74. Persons with a monthly per capita expenditure of less than ₹49.09 in rural areas, on average, consumed less than 2,400 calories and were categorised as poor. The poverty line for later years was estimated by updating the poverty line for 1973–74 by adjusting for price changes with the consumption basket remaining unchanged.

Subsequently, it was felt that applying the national poverty line to all states did not account for price differentials across the states. It was also recognised that the adjustment procedure was inappropriate as the difference between NSSO household consumption and National Accounts Statistics (NAS) reported private final consumption expenditure kept increasing over time. Consequently, in 1993, the Lakdawala Committee disaggregated state-specific poverty lines using interstate price differentials. These were then updated for subsequent years by price deflators. This expert group also recommended that the total NSSO consumption levels should not be adjusted to the NAS data as the divergence between the two sets of data was substantial. This methodology was used by the Planning Commission to provide official estimates for poverty until January 2011. Over the years, this methodology came under substantial criticism (Deaton and Tarozzi 2000; Deaton 2003, 2008; Patnaik 2007, 2010), primarily because the price-adjusted poverty lines failed to capture changing consumption baskets and to preserve the original calorie norms.

In 2005, yet another expert group was set up under the chairmanship of Suresh Tendulkar. This was mandated to look into the issue of comparability of NSSO data for 1993–94, 1999–2000 and 2004–05, and to re-examine alternative methods of measuring poverty. The expert group defined the monthly per capita expenditure corresponding to the poverty line basket (PLB) that resulted in an urban poverty headcount ratio at 25.7% in 2004–05 as the new poverty line. This new reference PLB was used for both the rural and urban population in all states after correcting for the urban–rural price differentials as well as the state relative to all-India price differential. However, this method to derive a set of updated prices for poverty measurement was only applied to goods and services for which the NSSO survey data provide meaningful quantities. For categories of consumption for which unit values could not be readily computed, such as education and healthcare, the Tendulkar methodology used price information from a variety of other sources.¹ This renders the methodology somewhat ad hoc since future poverty lines are likely to depend on a set of myriad sources that are not necessarily comparable with the current ones.

Almas et al (2013) develop an alternative approach for price and (resulting) poverty comparisons, in which price levels are indirectly estimated based on the behavioural assumption that equally poor households (those with the same demographic and occupational characteristics who pay the same relative prices) spend the same proportion of the total income on food. Therefore, if two comparable households in different Indian states have the same nominal expenditure levels, the authors attribute any difference in their budget

shares for food that cannot be explained by differences in relative prices, to price-level differences between the states. The price estimates resulting from this Engel curve exercise² are normalised so that they match the all-India poverty line for 2004–05 as presented by the Tendulkar Expert Group. This implies that the derived all-India headcount ratios for 2004–05 differ from the official ones only because of different spatial prices.

Furthermore, according to the Tendulkar Expert Group, it took a conscious decision not to relate the poverty line to a calorie norm. This departure from conventional wisdom was attributable to (i) overwhelming evidence of a downward shift in calorie Engel curves over time, and (ii) a lack of correlation between calorie intake and other nutritional outcomes. These reasons for moving away from the calorie norm anchor appear unsatisfactory. For one, a downward shift in the calorie Engel curve is almost an universal phenomenon (Raveendran 2010). It only implies that the PLB needs to be updated with more recent data. Similarly, while it is widely recognised that nutritional outcomes are affected by a multiplicity of factors, an observed lack of correlation with calorie intake may be attributable to comparing data from different surveys. In fact, the Tendulkar Committee actually did not reject the calorie norm as the basis for estimating poverty. Their new poverty numbers are derived from the existing urban poverty headcount ratio which itself is based on calorie norms (Alagh 2010). Furthermore, basing rural poverty estimates on an urban consumption basket is not appropriate. For instance, an urban consumption basket will give a higher weight to transport and house rent which will be marginal for rural households.

Taking Account of Change

In all the aforementioned expert groups, the consumption basket was the same as recommended by the task force of 1973–74. Therefore, official poverty estimates in all subsequent years were delinked from the prescribed nutrition norm on the assumption that price indexation would preserve access to nutritional standards. However, the consumption basket of households are likely to have changed over time due to several factors including changes in the relative price of consumables, changing preferences, less arduous work, better health, and a decline in availability of public goods, especially educational and health facilities. Changing food baskets or the increasing importance of non-food items in total household expenditure, in turn, may have resulted in calorie intake having changed over time. Therefore, it is important that in any estimation of poverty, the changes in actual consumption be accounted for. Such an attempt was first made by Nayyar (1992) wherein for each of the quinquennial rounds of the NSSO up to 1987–88, the actual consumption of food items was converted into the calorie equivalent and those in rural areas consuming less than 2,200 calories per capita per day were categorised as poor.³ Patnaik (2013, 2010) carried out a similar exercise for every large NSSO round on consumer expenditure between 1993–94 and 2009–10.

The most recent expert group to review the methodology for measurement of poverty was set up under C Rangarajan, which submitted its report in 2014 but it is yet to be accepted. A few important points of departure in the methodology adopted by this expert group are:

- (i) Normative level of adequate nourishment should be defined in terms of calorie, protein and fat as per the ICMR norm and any food basket should meet the nutritional requirement.
- (ii) Certain amounts should be included for clothing, housing, transport, education and other basic non-food items. This methodology certainly seems more appropriate than the earlier ones. We understand that the government has set up yet another group under the vice chairman, NITI Aayog, to re-examine the issue of poverty measurement. However, this report is not yet available.

Changing Household Expenditure: Item-wise Analysis

Background and motivation: Analysing the rural data for 2009–10, Patnaik (2013) finds that the calorie intake is below 2,200 for 70% of persons and is reached only by the eighth decile group. Given that each decile group has 10% of all persons with a little more than half spending below the mean, Patnaik (2013) infers that at least 75% of all rural persons were poor in 2009–10. In fact, there appears to be an increasing divergence between poverty estimates based on the nutrition-invariant poverty lines and the official poverty ratios (on revised basis) released by the Planning Commission. Between 2004–05 and 2009–10, poverty headcount ratios based on the latter declined from 41.5% to 33.8% in rural India, while those based on the former increased from 69.5% to 75.5% (Patnaik 2013).⁴ According to Patnaik (2013), official poverty lines have therefore cumulatively underestimated true poverty lines, permitting access to a level of nutritional intake which is not constant but continuously declining over time, thus violating the very definition of a poverty line. The 2009–10 NSSO survey on consumption expenditure was fraught with difficulty. We have therefore repeated the same exercise for 2011–12 to find a rural poverty headcount ratio of 77.8% (Table 1).⁵

Empirical studies in the literature suggest that between 1987–88 and 2009–10, average calorie intake in rural India declined by 14% while average (inflation-adjusted) per capita expenditure increased by 28% (Deaton and Dreze 2009). This pattern is quite unlike that found in cross-country data (Chandrasekhar and Ghosh 2003). In seeking to explain India's "calorie consumption puzzle," the literature on the subject alludes to a range of possible factors.

These include a food budget squeeze (Basu and Basole 2012; Mehta and Venkatraman 2000; Sen 2005), under-reporting of calorie intake due to eating outside the home (Smith 2013), changes in the relative price of food (Gaiha et al 2013; Gaiha, Jha and Kulkarni 2010; Patnaik 2010), dietary diversification (Landy 2009; Mittal 2007; Rao 2000), and the voluntary choice of spending on luxuries such as TVs and mobile phones over food (Banerjee and Duflo 2011).

It is possible that calorie needs have declined relative to the prescribed minimum over time owing to more sedentary lifestyles and better health status (Deaton and Dreze 2009; Eli and Li 2012; Rao 2000). Yet, given the relatively poor performance of India in improving child and adult nutrition on the basis of a set of anthropometric measures (Deaton and Dreze 2009), the relatively low levels of calorie intake—short of basic nutritional requirements—in a significant proportion of

Table 1: Percentage of Rural Population below the Calorie Norms, 2004–05 and 2011–12, State-wise

State	2004–05	2011–12
Andhra Pradesh	83.3	72.5
Assam	84.1	86.5
Bihar	78.2	78.8
Chhattisgarh	84.1	81.6
Delhi	81.9	81.1
Gujarat	84.3	88.5
Haryana	67.3	68.6
Himachal Pradesh	65.9	50.0
Jammu and Kashmir	65.3	57.1
Jharkhand	85.5	81.2
Karnataka	89.8	82.6
Kerala	79.6	81.8
Madhya Pradesh	87.0	75.9
Maharashtra	86.5	77.8
Odisha	77.6	77.8
Punjab	67.1	62.7
Rajasthan	73.6	65.7
Tamil Nadu	88.2	87.5
Uttar Pradesh	73.0	76.4
Uttarakhand	74.3	51.6
West Bengal	77.7	79.4
India	79.8	77.2

Source: Author's estimates based on NSSO.

Table 2: Household Expenditure, 1993–94, 2004–05 and 2011–12, All-India (Rural)

Items	Share			Percentage Contribution to Growth		
	1993–94	2004–05	2011–12	1993–94 to 2004–05	2004–05 to 2011–12	1993–94 to 2011–12
Cereals and cereal substitutes	24.4	18.1	12.0	1.98	-4.11	-1.50
Pulses and products	3.8	3.2	3.3	1.63	3.46	2.68
Fruits and vegetables	7.8	8.3	6.8	9.76	2.57	5.65
Egg, fish and meat	3.3	3.3	3.6	3.31	4.20	3.82
Milk and milk products	9.5	8.5	9.1	5.79	10.72	8.60
Salt and sugar	3.2	2.6	2.0	0.87	0.62	0.73
Edible oil	4.4	4.6	3.8	5.06	1.54	3.05
Spices	2.5	1.9	2.3	0.47	3.18	2.02
Beverages	2.0	2.0	1.6	2.07	0.67	1.27
Processed food	2.2	2.5	4.2	3.44	8.62	6.40
Pan, tobacco and intoxicants	3.2	2.7	2.4	1.40	1.45	1.43
Fuel and light	7.4	10.2	9.2	17.37	6.77	11.31
Medical (institutional and non-institutional)	5.4	6.6	6.9	9.63	7.50	8.41
Education	1.4	2.7	3.1	5.79	4.32	4.95
Clothing, bedding and footwear	6.3	5.3	7.6	2.79	13.77	9.06
Entertainment	0.3	0.6	1.1	1.40	2.43	1.99
Minor durable-type goods	0.2	0.2	0.3	0.23	0.70	0.50
Toilet articles	2.4	2.7	2.4	3.28	1.65	2.35
Other household consumables	2.2	2.3	2.2	2.78	1.87	2.26
Consumer services excl conveyance	2.5	3.8	4.5	7.11	6.40	6.71
Conveyance	2.4	3.8	4.8	7.33	7.43	7.39
Rent	0.4	0.5	0.5	0.84	0.49	0.64
Consumer taxes and cesses	0.1	0.2	0.3	0.43	0.49	0.47
All consumer durables	2.7	3.4	6.1	5.26	13.25	9.82
Total	100.0	100.0	100.0	100.00	100.00	100.00

Source: Author's estimates based on NSSO.

the population suggest that purely voluntary explanations are unlikely to suffice.

Item-wise decomposition of household budgets: It is clear from the preceding discussion that the quantities of different items in the consumption basket of households have changed over time, and in a way that has reduced calorie intake. The literature is rather scant on documenting these changes in household consumption patterns. Patnaik (2013) provides a glimpse by summarising changes in the main categories of spending between 1987–88 and 2009–10. The author shows that the share of “all food” in the average household budget in rural India declined by 10.4 percentage points over the two decades, almost matched by a rise in spending on “miscellaneous goods and services” by 9.5 percentage points. Similarly, Basole and Basu (2015b) present the changing shares of major non-food categories at the all-India level. In order to explore these changes in considerably greater detail, we carry out an accounting exercise, which decomposes the growth in total household expenditure into different items of consumption (Table 2, p 63).

At the all-India level, food items contributed to about one-third of the increase in total household expenditure between 1993–94 and 2011–12. Cereals was the only group of items that had a negative contribution. Dairy products were the single largest category, accounting for 8.6% of the increase in total household expenditure. The other important categories underlying the dietary diversification were fruits and vegetables and processed food, accounting for, respectively, about 5.6% and 6.4% of the increase in total household expenditure between 1993–94 and 2011–12. The remaining contribution of food items comprised egg, fish and meat (3.8%), edible oil (3.1%), pulses (2.7%), spices (2.0%), pan, tobacco and intoxicants (1.4%), beverages (1.3%), and salt and sugar (0.7%).

Amongst non-food items, which accounted for two-thirds of the increase in total household expenditure between 1993–94 and 2011–12, fuel and light was the most important category with a contribution of 11.3%. Amongst other non-food essentials, clothing–bedding–footwear and other household consumables, respectively, contributed 9.1% and 7.1% to the total increase. Increases in education and health expenditures accounted for 13.4% of the increase in total household expenditure, of which health was the dominant component. Conveyance charges and other consumer services, respectively, contributed to 7.4% and 6.7% of the increase in total household expenditure between 1993–94 and 2011–12. Consumer durables were another important category, having contributed 9.8% to the overall increase. The contribution of rent and consumer taxes was marginal.

In decomposing the growth of total household expenditure between 1993–94 and 2011–12 for the bottom 50% of the population, we find that food items were distinctly more important; they contributed to about one-half of the growth (Table 3, p 65). As with the overall distribution, growth in household expenditure on dairy products and fruits and vegetables made an important contribution at 10.3% and 7.5% respectively. The percentage contribution of processed food, at 7.1%, is even higher for the

population's bottom 50%. Edible oils also made a marked contribution at about 4.7%. The remaining contribution of food items comprised egg, fish and meat (4.4%), pulses (3.9%), spices (2.7%), pan, tobacco and intoxicants (1.9%), beverages (1.9%), and salt and sugar (1.7%). Cereals too had a positive, albeit small, contribution.

Amongst non-food items, which accounted for about half the increase in total household expenditure between 1993–94 and 2011–12 for the bottom 50%, fuel and light was the most important category with a contribution of almost 15%. As with the overall distribution, other non-food essentials also made important contributions; clothing–bedding–footwear and other household consumables, each accounted for 8% of the increase in total household expenditure between 1993–94 and 2011–12. The same holds true for conveyance and other consumer services at 5.4% and 6.4% respectively. Compared with the overall distribution, education and health—at approximately 7%—account for a much smaller proportion of the increase in total household budget of the bottom 50% of the population. Similarly, consumer durables matter much less in explaining growth of bottom 50%'s household budget, their contribution is negligible. The results from a decomposition of the growth in the household budget of the bottom 30% of the population reveal similar patterns.

Consumption amongst the bottom 50%: Of the categories that are important contributors to the growth in household expenditure of the bottom 50% of the population between 1993–94 and 2011–12, there are important differences between two sub-periods. Within the category of food, fruits and vegetables, and edible oil—at 12.1% and 7.1% respectively—were the largest contributors between 1993–94 and 2004–05. Between 2004–05 and 2011–12, however, dairy products and processed food were the largest contributors; they accounted for, respectively, 14.6% and 11.1% of the increase in total household expenditure. Amongst non-food items, fuel and light accounted for 19% of the increase in total household expenditure between 1993–94 and 2004–05, compared to 10.5% between 2004–05 and 2011–12. Conversely, the contribution of clothing, bedding and footwear increased from 4.8% between 1993–94 and 2004–05 to 10.5% between 2004–05 and 2011–12.

The results of the growth decomposition exercise are reflected in the changing shares of different items in the consumption basket of households (Table 3). At the all-India level, in 1993–94, the bottom 50% of the rural population spent more than 30% of their household budget on cereals while the bottom 90% spent up to 20%. Only the top decile group spent around 13%. In 2011–12, the share of cereals (and cereal substitutes) in total household expenditure declined to only 16% for the bottom 50% of the rural population.⁶ This significant decline in the share of cereals and cereal substitutes between 1993–94 and 2011–12—about 16 percentage points for the rural population's 50%—is picked up, in part, by an increase in the share of other food items; for example, the share of dairy products increased from approximately 7% to 9% while that of processed food more than doubled from 2%

Table 3: Household Expenditure of the Bottom 50%, 1993–94, 2004–05 and 2011–12, All-India (Rural)

Items	Share (%)			Percentage Contribution to Growth		
	1993–94	2004–05	2011–12	1993–94 to 2004–05	2004–05 to 2011–12	1993–94 to 2011–12
Cereals and cereal substitutes	32.7	25.9	16.1	12.34	-17.58	1.65
Pulses and products	4.5	4.0	4.2	3.13	4.46	3.88
Fruits and vegetables	8.4	9.7	7.9	12.12	3.89	7.46
Egg, fish and meat	3.2	3.2	3.8	3.20	5.39	4.44
Milk and milk products	7.3	6.5	8.9	4.73	14.59	10.32
Salt and sugar	3.5	2.9	2.5	1.75	1.63	1.68
Edible oil	5.1	5.8	4.9	7.10	2.91	4.73
Spices	3.0	2.4	2.9	1.23	3.88	2.73
Beverages	1.7	2.0	1.8	2.52	1.55	1.97
Processed food	2.1	2.1	4.8	1.96	11.13	7.16
Pan, tobacco and intoxicants	3.6	3.0	2.7	1.80	1.96	1.89
Fuel and light	8.9	12.3	11.7	19.05	10.49	14.20
Medical (institutional and non-institutional)	3.5	3.6	4.3	3.73	6.14	5.09
Education	0.9	1.5	1.8	2.93	2.38	2.62
Clothing, bedding and footwear	2.1	3.0	5.3	4.84	10.49	8.04
Entertainment	0.2	0.3	1.0	0.52	2.45	1.61
Minor durable-type goods	0.1	0.1	0.3	0.17	0.61	0.42
Toilet articles	2.4	3.0	2.9	4.31	2.44	3.25
Other household consumables	2.3	2.6	2.5	3.19	2.21	2.63
Consumer services excl conveyance	2.0	3.1	4.4	5.17	7.38	6.42
Conveyance	1.5	2.1	3.6	3.47	6.85	5.39
Rent	0.1	0.1	0.2	0.09	0.33	0.22
Consumer taxes and cesses	0.1	0.1	0.3	0.25	0.62	0.46
All consumer durables	0.7	0.6	1.2	0.39	2.76	1.73
Total	100.0	100.0	100.0	100.00	100.00	100.00

Source: Author's estimates based on NSSO.

Table 4: Percentage Share of Cereals and Cereals Substitutes in Total Household Expenditure, 1993–94, 2004–05 and 2011–12, State-wise (Rural)

Items	For All Rural Population			For the Bottom 50%		
	1993–94	2004–05	2011–12	1993–94	2004–05	2011–12
Andhra Pradesh	23.8	19.4	11.4	31.6	25.9	14.8
Assam	34.5	24.8	18.5	39.3	30.8	23.0
Bihar	35.7	27.1	16.5	44.2	33.8	21.0
Chhattisgarh	36.1	27.2	15.6	44.6	35.6	20.0
Gujarat	16.4	13.4	8.8	21.0	17.8	12.6
Haryana	12.6	8.6	6.5	19.1	13.6	8.8
Himachal Pradesh	18.3	12.8	8.3	27.0	18.1	12.5
Jammu and Kashmir	20.9	17.4	12.2	28.0	21.6	14.9
Jharkhand	38.4	27.2	19.6	48.3	34.5	24.0
Karnataka	22.3	16.5	10.8	27.7	20.7	15.0
Kerala	18.2	11.5	6.0	25.4	17.6	9.6
Madhya Pradesh	22.1	18.1	12.5	30.4	23.0	16.8
Maharashtra	17.9	14.9	10.8	22.5	20.4	13.8
Odisha	38.3	28.3	18.9	48.4	39.2	23.8
Punjab	10.3	8.8	5.9	15.1	13.4	8.6
Rajasthan	17.8	14.5	8.9	24.8	18.9	11.8
Tamil Nadu	24.1	15.5	10.2	33.8	20.8	13.9
Uttar Pradesh	21.5	17.8	12.4	31.4	25.0	17.1
Uttarakhand	18.2	15.2	9.8	24.5	21.2	13.5
West Bengal	32.7	23.5	18.2	43.9	31.3	23.6
All-India	24.4	18.1	12.0	32.7	25.9	16.1

Source: Author's estimates based on NSSO.

to 5% between 1993–94 and 2011–12. Two categories of non-food essentials that increased in importance were fuel and light and clothing–bedding–footwear, between 1993–94 and 2011–12, their shares in total household expenditure increased, respectively, from 9% to 12% and 2% to 5.5%. The

increase in the share of education and health in total household expenditure of the bottom 50% between 1993–94 and 2011–12 was much less pronounced. Conveyance and other consumer services, in contrast, more than doubled from 3.5% in 1993–94 to 8% in 2011–12.

An analysis of consumption patterns in India's major states also shows a considerable decline in the expenditure on cereals between 1993–94 and 2011–12, both for the entire rural population as also the lowest 50% (Table 4). As with the patterns at the all-India level, other food items as well as some non-food items have contributed to the reduction in consumption of cereals.⁷

States can be categorised into three groups. Those with the highest consumption of cereals are Assam, Bihar, Chhattisgarh, Jharkhand, Odisha and West Bengal. On the other hand, Gujarat, Haryana, Kerala, Punjab and Uttarakhand have the lowest consumption expenditure on cereals. The remaining states form the middle category. It should be noted that the states with the highest consumption of cereals are also the states with the highest proportion of poor in the country. In the poorest states for the bottom 50%, the expenditure on cereals in 1993–94 was in the region of 40%, while in Gujarat, Haryana, Punjab and Maharashtra it was only 15%–20%. In the middle category, it ranged from 25% to 30%. In 2011–12, compared to 1993–94, it declined to about half in all three groups of states. For the rural population as a whole, the corresponding expenditure was 30%–40% in 1993–94 in the worse-off states and 10%–15% in Gujarat, Haryana and Punjab. By 2011–12, it had again declined to roughly half.

A more detailed examination of the consumption basket suggests that the expenditure on cereals was the single largest item for the bottom 50% in 1993–94, except in Haryana and Punjab. By 2011–12, in several states including Gujarat, Himachal Pradesh, Kerala and Punjab, the consumption expenditure on cereals had declined and it was no longer the single-most important item of expenditure. If we examine the share of other food items, the consumption of pulses has, by and large, been low in all states accounting for 3%–5% of the expenditure and of fruits and vegetables has been around 6%–8%. In the case of egg, fish and meat, there is considerable variation across states. The same holds true for the consumption of milk and milk products and may be explained—at least in part—by differences in dietary preferences. For example, in Haryana, Punjab and Rajasthan, it was very high, in the region of 18%–20%, while in Gujarat and the hill states, it was in the region of 12%–14%. However, the consumption of milk and milk products was relatively high even in 1993–94. Hence, the decline in consumption of cereals was not compensated for by an increase in the consumption of milk and milk products. In

contrast, in Chhattisgarh, Jharkhand, Kerala, Odisha, and West Bengal, the consumption of milk and milk products was very low, less than 4%.

Therefore, an examination of the data indicates that the decline in cereal consumption was not compensated for by a significant increase in other food items across states in the consumption basket of the poorest five deciles. In other words, while there is a presumption that over time there must have been a diversification in the share of different food items, the data do not lend support to this hypothesis. Therefore, it may be worthwhile to analyse whether increased expenditure on non-food items would account for the decline in the consumption of cereals and cereal substitutes.

The single-most important item of consumption, which is relatively high in all states is “fuel and light,” even for the bottom 50% of the rural population. Its share in total household expenditure increased between 1993–94 and 2011–12 in almost all states. This may be explained, in part, by the reduced supply and availability of traditional sources of fuel, and an increase in commercial fuel. Over the period, it comprised 10% of total household expenditure on average, although its share was somewhat higher in states with lower levels of per capita income. There is evidence of a “food budget squeeze” for the poor in India, whereby the decline in calorie intake due to lower consumption of cereals has been driven, at least in part, by rising expenditure on fuel (Basole and Basu 2015a).

For some of the other items, there was an increase in consumption between 1993–94 and 2011–12. For the poorer five deciles these items were: (i) clothing, bedding and footwear; (ii) processed food; (iii) consumer services; and (iv) conveyance. Brief comments on each of these follow. The share on clothing, bedding and footwear was about 7% in several states while in some, it was lower. There is no discernible pattern that needs explanation. Surprisingly, even for the poor in rural areas, processed food showed an increase over time even though the percentage of expenditure attributed to it was not very high. This is not surprising because processed food includes cooked meals received at the workplace. This is a common practice in rural areas for both the skilled and unskilled labour as food is in lieu of part payment of wages. It also includes snacks and sweets which are consumed especially in times of religious or marriage celebrations. Consumer services include services of tailors, priests, washermen, domestic help, etc. The poor do spend a part of their income on some of these. These too have gone up over time, though again in most states their share would be small. There is some increase in the expenditure on conveyance which is not surprising as more rural people travel some distance to the urban hinterland for work. This could be by bus, local trains, rickshaws or autos. Given that jobs in villages are becoming scarce, there is movement of people to look for better work opportunities outside their home while still living in the village.

There is an ongoing perception that the poor are spending more on health and education, yet this is not borne out by data. Health accounts for more than education, but it is still less than 5% in almost all states; in Kerala it is around 7%. In

education, the expenditure does not exceed 3% of total household expenditure across all major states, even in 2011–12. Similarly, insofar as consumer durables are concerned, the poor hardly spent anything on it. This too does not support the common perception that the poor are spending on consumer goods such as mobile phones. However, for the rural population as a whole, there has been a noticeable increase in the expenditure on consumer durables between 1993–94 and 2011–12, thereby indicating that even in rural India, the higher income deciles are spending more on consumables.

The analysis across major states in the paper has been limited to two points in time, namely, 1993–94 and 2011–12. The data for 2004–05 is also available. We have studied this and the major conclusion one can draw is that there was a decline in the consumption of cereals and cereal substitutes between 1993–94 and 2004–05, which is an 11-year period, but the decline was far greater between 2004–05 and 2011–12. In the case of other items, a definite shift is not discernible. In some states and for some items, there is an increase in the share of expenditure between 1993–94 and 2004–05, and again a decline for the same items between 2004–05 and 2011–12. In other cases, there is a steady decline or increase. However, the analysis on the decline in the consumption of cereals would remain valid even if we introduce data on 2004–05.

Changed Consumption Baskets

The broad conclusion that follows from the above analysis suggests that the share of cereals in total household expenditure declined significantly over time in all states for the bottom 50% of the rural population. This comes as a surprise primarily because cereals are the cheapest way of getting adequate nutrition in terms of calories. Rice and wheat, in particular, have also been the staple food of Indians for centuries. It is possible that the need for calories has diminished over time due to a lower level of physical activity and an overall improvement in the health status. It is also possible that calorie intake is not synonymous with nutritional status and dietary diversification, away from cereals and towards other food items, may therefore reduce calorie intake but not nutrition. So, in an accounting sense, what explains the declining share of cereals in total household spending? It has certainly not been accompanied by a commensurate increase in the expenditure on one or even a few other items. Instead, it seems to be distributed over a number of items each accounting for small increases. Amongst food, dairy products and processed foods stand out. Amongst non-food items, consumer services are one of several categories that account for a greater share of the bottom 50%’s household budget than before. These changes can perhaps be best summed up in terms of voluntary practice: changes in preferences for other food items or for better services. At the same time, budget categories such as fuel and light, clothing–bedding–footwear, and conveyance also stand out in their contribution to the changing composition of household expenditure. This perhaps reflects a “budget squeeze,” attributable to structural factors that are beyond the control of households. Structural factors could include the need for

commuting, resulting in higher transportation costs or higher prices owing to the reduced availability of traditional fuel sources. At the end, it is plausible to suggest, but impossible to prove, what defines “necessary” spending for “poor” households. It is therefore very difficult to distinguish voluntary and involuntary factors that would have had an impact on consumption patterns of the rural population.

Counterfactual Scenarios: A Thought Experiment

In documenting evolving patterns of household expenditure, based on item-wise household consumption data, the previous section highlighted a significant decline in the consumption of cereals between 1993–94 and 2011–12. Given that estimates of poverty based on calories are very sensitive to the intake of cereals, this is closely linked to calorie-based poverty estimates being as high as 77% at the all-India level (as well as for several major states) in 2011–12. This dramatic increase in the proportion of the poor, which is in sharp contrast to all estimates so far which shows a decline in poverty over time, seems somewhat implausible and unrealistic. Perhaps, it therefore warrants a fresh approach of thinking about how to measure these numbers. We carry out a thought experiment in this regard in order to develop a series of counterfactual scenarios, based on a given set of assumptions. This follows other approaches in that it aims to establish a range of poverty estimates. Consider, for example, the World Bank’s poverty estimates based on \$1.25 day and \$2 a day or Government of India’s (2007) classification of “extremely poor”, “poor”, “marginally poor”, and “vulnerable” based on variants of the poverty line basket.⁸

How much would households defined as “calorie poor” need to spend to meet the prescribed calorie norm of 2,200 per capita per day? The calorie shortfall, x , is defined as 2,200 minus actual calories per capita per day. By definition, calories will accrue to individuals from all food items in their consumption basket. From the current consumption basket, we derive the proportion in which households derive their calories from different items of consumption. So, for example, define a =calories from rice/total calories, b =calories from wheat/total calories, and c =calories from other food/total calories. We make the simplifying assumption that the extra calories needed to bridge the calorie shortfall (x) will be divided among the three food categories in the same proportions as they are derived currently. This is done separately for 1993–94 and 2011–12. Therefore, the extra calories from rice, wheat and other food items, respectively, equals $a.x$, $b.x$ and $c.x$.

The next step involves converting these extra calories into quantity equivalents. We know that, for example, z calories come from 1 unit of rice. This implies that 1 calorie comes from $1/z$ units of rice which, in turn, implies that $a.x$ calories are derived from $(1/z)*a.x$ units of rice. The extra units of wheat and extra units of other food required to meet the calorie shortfall are similarly derived. The money value of these required extra units of food can be computed by applying the relevant implicit prices.⁹ The combined money value of all extra units of food, expressed at the per capita per day level, is then multiplied by household size and the number of days in a

month. This facilitates a comparison with other household expenditure which is expressed in terms of monthly household expenditure.

The money value of the required extra units of food, adjusted for household size and expressed on a monthly basis, is added to actual household expenditure on food and this sum is then compared to total household expenditure (including food and non-food items). If a household’s actual expenditure on food combined with “extra” needed to meet the calorie shortfall is less than its total expenditure, it suggests that if a household spent all its money on food items (in the proportion currently consumed), it would be able to meet the prescribed calorie norm. Applying the appropriate within household weights, this gives us a “poverty headcount” estimate resulting from the counterfactual scenario.

This method yields, at the all-India level, a “poverty estimate” of 14.4% in 1993–94 and 2.6% in 2011–12 (Table 5, p 68). The declining numbers are clearly indicative of the fact that household expenditure on non-food items has been rising over time. The same pattern is found if this exercise is replicated for the major states; in all, actual expenditure on food combined with “extra” needed to meet the calorie shortfall is less than its actual total expenditure for 5% of households in 2011–12. Now, compare, for instance, in 2011–12, a poverty headcount ratio of 77% based on the nutritional-invariant poverty line with an estimate of 3% based on the counterfactual described. These represent an upper- and lower-bound. The poverty estimate of 3% is obviously unrealistic insofar as households undoubtedly need to spend part of their budget on non-food essentials. What are these essentials? And how can a normative minimum be prescribed for such items?

The Rangarajan Committee Report (Government of India 2014) identifies education, clothing, conveyance and house rent as essential non-food item groups. This appears somewhat arbitrary. For example, it is not apparent why education is essential, not health. Similarly, it is not clear why clothing is more essential than footwear and bedding. In our view, there can be little debate that clothing, bedding and footwear are “essential” non-food items. The same holds true for fuel and light. Conveyance charges are also becoming increasingly important as people’s livelihoods are often dependent on commuting to their place or multiple places of work. On the other hand, house rent, while important, is not very relevant for analysis of rural poverty because it constitutes a negligible share of total household expenditure in rural areas.

The Rangarajan Committee Report (Government of India 2014) defines a normative minimum level of consumption expenditure with respect to these items of consumption as the (relevant) actual expenditure of the median fractile class. In this paper, the normative minimum level of expenditure with regard to non-food essentials is defined by the actual level of expenditure on these items incurred by the median household in the 6th decile group, that is, the group which meets the prescribed nutrient norm of 2,200 per capita per day in rural areas at the all-India level in both 1993–94 and 2011–12.¹⁰

Adding the 6th decile group's median household expenditure on clothing–bedding–footwear, fuel and light, and conveyance to the previous derived sum of food expenditure, provides a second counterfactual. It shows that in 2011–12, the total expenditure for 23.4% of the population was less than the sum of actual expenditure on food, extra expenditure on food to meet the calorie shortfall and the 6th decile group's median expenditure of non-food essentials as defined above. The corresponding number for 1993–94 is 29.1% (Table 5). A group of states followed this all-India pattern in that the percentage of the rural population by this metric declined between 1993–94 and 2011–12. These include Andhra Pradesh (where the decline was quite significant from 28% to 13% over the decades), Bihar, Himachal Pradesh, Jharkhand, Kerala, Maharashtra, and Tamil Nadu. In states such as Chhattisgarh, Haryana, Karnataka, Odisha, Punjab, Rajasthan, Uttar Pradesh, and West Bengal, the percentage of the rural population for whom total household expenditure was less than the sum of actual expenditure on food, extra expenditure on food to meet the calorie shortfall and the respective median decile group's median expenditure of non-food essentials remained broadly unchanged between 1993–94 and 2011–12. In Gujarat and Madhya Pradesh, poverty actually increased by this metric during the same period. While this warrants further analysis, it suggests that the normative minimum expenditure on these essential non-food items has increased relatively more in these states.

Education and health services, especially the latter, are also likely to be classified as “essential” by most. In India, household expenditure on education and health has traditionally been low owing to (supposed) government subsidies in the provision of these services. Of late, however, the literature documents higher household expenditure on these social services, arguably on account of the low quality and poor delivery of education and medical care provided by the public sector. This expenditure, in all likelihood, reflects an element of choice exercised by households. But it may also represent an “essential” need which is not being met by subsidised public services. Adding the expenditure, of the 6th decile group's median household, on education and health to the previously derived sum of expenditure on food and non-food essentials provides a third counterfactual. It shows that in 2011–12, the total expenditure for 28.6% of the population was less than the sum of actual expenditure on food, extra expenditure on food to meet the calorie shortfall and the 6th decile group's median expenditure on clothing–bedding–footwear, fuel and light, conveyance, education and health. The corresponding number for 1993–94 is 32.8% (Table 5). These poverty estimates suggest that spending on education and health are not a major component of the household budget in rural areas at the all-India level. This result is borne out in the experience of different states as well. In both 1993–94

and 2011–12, the poverty headcount ratios resulting from the second and third counterfactuals are not very different. The exceptions to this norm are Kerala and West Bengal in 2011–12. In Kerala, the total expenditure for 37% of the population was less than the sum of actual expenditure on food, extra expenditure on food to meet the calorie shortfall and the respective median decile group's expenditure on clothing–bedding–footwear, fuel and light, conveyance, education and health compared to 24.6% for the counterfactual bundle without expenditure on education and health. The corresponding numbers for West Bengal were 40.4% and 26.2% respectively. This suggests that in 2011–12, the share of household expenditure in the categories of education and health was significantly higher in these two states.

The remaining major categories of household expenditure include durable goods, minor durable-type goods, toilet articles and other household consumables, entertainment services, consumer services (other than conveyance), and consumer taxes. Some can certainly be considered “non-essential” while others contain elements of what some may consider “essential”. Adding the expenditure of the 6th decile group's median household on all these items to the previously derived sum of expenditure on food, non-food essentials as well as education and health provide a fourth counterfactual. It shows that in 2011–12, the total expenditure for 51.1% of the population was less than the sum of actual expenditure on food, extra expenditure on food to meet the calorie shortfall and the 6th decile group's median expenditure on clothing–bedding–footwear, fuel and light, conveyance, education, and health and all other items as described earlier. The corresponding number for 1993–94 is 49.2% (Table 5). This counterfactual is different from the earlier ones in that the poverty ratio increased, albeit

Table 5: Rural Poverty Headcount Ratios in Different Scenarios, 1993–94 and 2011–12

Items	Counterfactual 1 (Food Only)		Counterfactual 2 (Food + Essentials)		Counterfactual 3 (Food + Essentials + Education and Health)		Counterfactual 4 (Food + Essentials + Education and Health + All Other Items)	
	1993–94	2011–12	1993–94	2011–12	1993–94	2011–12	1993–94	2011–12
Andhra Pradesh	14.67	1.18	28.2	12.5	31.0	17.1	46.4	42.4
Assam	19.47	5.55	34.6	43.8	36.1	48.1	48.8	72.1
Bihar	15.94	2.61	29.8	22.4	29.8	25.9	46.5	49.4
Chhattisgarh	13.67	4.07	27.6	25.9	28.9	27.2	47.5	47.5
Gujarat	19.13	5.31	37.2	42.4	37.2	45.7	55.7	67.1
Haryana	6.14	0.71	15.3	14.3	19.3	20.1	32.0	42.0
Himachal Pradesh	4.29	0.07	18.2	4.7	21.3	7.0	35.3	18.3
Jharkhand	25.87	4.64	40.1	32.1	40.1	35.7	55.4	59.4
Karnataka	15.03	4.19	30.6	32.4	34.5	37.7	50.6	63.2
Kerala	19.93	4.22	32.9	24.6	38.9	37.1	51.5	58.3
Madhya Pradesh	11.65	2.22	25.1	29.6	26.4	36.0	41.2	57.5
Maharashtra	18.46	1.62	34.6	25.9	38.0	32.1	56.7	56.4
Odisha	13.49	2.27	28.9	27.4	28.9	31.8	38.7	51.4
Punjab	4.52	0.48	14.8	14.3	19.7	22.5	33.0	40.1
Rajasthan	4.25	0.83	12.9	14.4	12.9	19.7	27.3	40.1
Tamil Nadu	28.28	2.98	43.3	35.8	43.9	44.7	59.0	67.5
Uttar Pradesh	7.94	1.60	21.0	22.6	25.1	31.3	39.7	51.6
Uttarakhand	3.40	0.01	12.6	8.1	17.0	9.6	34.4	26.1
West Bengal	13.22	4.33	25.8	26.2	27.6	40.4	38.8	57.9
India	14.4	2.6	29.1	23.4	32.8	28.6	49.2	51.1

Source: Author's estimates based on NSSO.

marginally, by this metric between 1993–94 and 2011–12. The same pattern is found for most major states, with the exception of Andhra Pradesh and two northern hill states of Uttarakhand and Himachal Pradesh. These findings suggest that the normative minimum expenditure on durable goods, minor durable-type goods, toilet articles and other household consumables, entertainment services, consumer services (other than conveyance), and consumer taxes as defined by the respective median decile group's expenditure has increased over the last two decades.

The reader may be tempted to place the 51.1% all-India poverty headcount estimate, as derived in the fourth counterfactual scenario, alongside the 77% all-India poverty headcount ratio as per the nutrition-invariant poverty line of 2,200 calories per capita per day. It suggests that a larger number of the rural household members are categorised as poor by latter, compared to the former. Given the different methods of estimation, however, the comparison of the two numbers is not straightforward. In the conventional method, rural households who consume less than 2,200 calories per capita per day are categorised as poor at any given level of total household expenditure. In the fourth counterfactual scenario, as developed here, households are identified as poor if their total (actual food plus non-food) expenditure was less than the sum of actual expenditure on food, extra expenditure on food to meet the calorie shortfall and the 6th decile group's median expenditure on all non-food items.

How can a meaningful comparison between the two be made? One possible way is the following.

The conventional nutrition norm-based measure defines households to be above the poverty line if they meet the prescribed calorie norms given the level of actual expenditure on non-food items. The fourth counterfactual scenario derived in this paper, in contrast, identifies households as not being "poor" if they meet the same prescribed calorie norms given a normative minimum level of expenditure on non-food items. Hence, what is different between the two is actual level of household expenditure on non-food items versus the "normative minimum" as defined by the expenditure of the median household in the 6th decile group at the all-India level. It is possible that some households that are not classified as poor in terms of the fourth counterfactual scenario are categorised as poor by the pure calorie-norm based measure because their actual expenditure on non-food items exceeds that of the median household in the 6th decile group, thereby reducing the amount they spend on food in order to derive calories.

This series of counterfactual scenarios highlights the fact that any measure of poverty depends fundamentally on what is considered an essential minimum. Some may think just food suffices. Others are likely to consider non-food essentials as being important. Still others can value the importance of health and education status. It may even be argued that consumer durables, such as mobile phones, by increasing mobility and productivity, are increasingly becoming important for improving livelihoods. Therefore, instead

of a single poverty estimate, the series of counterfactual scenarios developed in this paper show that it might be better to have different "deprivation" ratios based on what one believes matters or if it addresses a specific question one is looking to examine.

Looking Ahead

Poverty can also be estimated by conducting a census of the rural population and identifying those defined as "poor." Such an exercise is conducted by the Government of India's Ministry of Rural Development in order to identify beneficiaries who need government assistance under specific anti-poverty programmes. The first two below the poverty line (BPL) censuses (conducted in 1992 and 1997) yielded an estimate of the number of poor households at the village, block, district, and state levels. The third BPL census, conducted in 2002, ranked households within the village in terms of their socio-economic status, based on 13 indicators reflecting the levels of living and quality of life.

The Socio-Economic Caste Census (SECC) of 2011 builds on this methodology. The basic approach is threefold. First, it identifies households that are automatically excluded based on fulfilling any one of the 14 parameters of exclusion,¹¹ and hence do not need to be surveyed. Second, the census identifies households that should be automatically included in the definition of poverty on the basis of fulfilling any one of five parameters of inclusion. These include households without shelter, destitute households living on alms, manual scavenger families, primitive tribal groups, and legally released bonded labour. Of the remaining households, those with any one of seven possible types of "deprivation" were categorised as "poor." These include the quality and size of shelters, sources of household income and social factors, such as caste, gender, ethnicity, and disability.¹² For example, therefore, most discriminated Dalit groups, single-women households, disabled bread-earners or households headed by a minor are included in the list of the "poor."

Along these lines, Alkire and Seth (2009) developed a multi-dimensional poverty index that combines nine dimensions of well-being as measured by indicators in the National Family and Health Survey (NFHS). These include living standards (housing type and access to electricity), health (the minimum Body-Mass Index of one woman in the household), water and sanitation (access to improved sanitation and drinking water source), air quality (sources of cooking fuel), assets (asset holding), education (maximum year of education completed by any household member), livelihood (occupation of the respondent and her partner), child status (child labour and/or child school attendance), and empowerment (empowerment of women in the household).

Similarly, Radhakrishna (2015) combine the NSS 61st round consumer expenditure data and the NFHS-3 data to estimate multidimensional poverty by considering three types of deprivations in a household: income poverty, child malnutrition and female chronic energy deficiency. In the absence of information on income/expenditure in the NFHS-3, data on a household's

possession of consumer durables and ownership of assets was used to compute a standard of living index (SLI). The authors established a SLI-based poverty line by equating the percentage of poor households below poverty line computed from the NSSO data with the percentage of households below the SLI.¹³ The resulting estimate of multidimensional poverty, measured as the proportion of households that is either poor or had a stunted child or a woman suffering from chronic energy deficiency, was 83.3% for rural India. This was much higher than the corresponding estimates of one-dimensional poverty, either in the income or the nutrition space. At the lower bound, the intersection measure of multidimensional poverty which was the proportion of households that was poor, had a stunted child as well as a chronic energy-deficient woman was estimated at 16.3% for rural India.

Insofar as targeted beneficiary-oriented schemes are concerned, they are either self-targeted like MGNREGA or targeted at those identified as poor by the BPL/socio-economic census. So what then is the purpose of NSS consumption-based poverty estimates if they are not used for the allocation of funds to beneficiary-oriented government programmes? These poverty ratios are useful to assess inter-spatial and inter-temporal changes, that is, changes in poverty at national, state, or district levels and/or over time. This, in turn, can have important policy implications; for example to assess the impact of economic growth and/or anti-poverty programmes in reducing poverty rates.

The question remains as to why census-based deprivation data cannot also be used for this purpose. The Rangarajan Committee (Government of India 2014) provides some explanations. For one, the seven deprivations are not deprivations in the conventional sense of income, health and education, etc. For example, it is true that landless households deriving a major part of their income from manual labour constitute the largest number of under-deprivation households. However, it is not clear whether landlessness (or manual labour) can be sufficient to conclude they are suffering from poverty. Over time, landlessness will increase and people will diversify their income with a rise in non-agricultural activities and migration. Furthermore, poor households as identified through these censuses contain a mix of poor and non-poor for a variety of reasons. For instance, self-reporting may be affected because people know beforehand that the census is going to decide the status of the household as poor or non-poor, and therefore their entitlement. In addition, defining poverty in terms of income or expenditure also facilitates comparisons with other countries.

In sum, SECC and NSSO data-based estimates are complements. The former are important for the identification of programme beneficiaries, while the latter are useful for assessing changes in poverty at the macro level across space and over time.

Conclusions

The incidence of rural poverty based on the 2,200 per capita per day calorie norm has increased dramatically between

1993–94 and 2011–12. These estimates are in direct contrast to official estimates of poverty which show a decline in rural poverty over the same time period. A detailed examination of changes in the consumption expenditure of the rural population and of the bottom 50%, considered separately in this paper, shows a considerable decline in the consumption of cereals between 1993–94 and 2011–12, which explains the decline in calorie intake. This holds true both at the all-India level and for all major states. The decline is accompanied by a diversification of consumption into other food items as well as a number of non-food items. But our analysis shows that many items account for small increases in consumption, some more than others, without any one or two items showing a significant increase or accounting for large proportion of total increase. This changing consumption basket is perhaps indicative of both voluntary choices and structural factors beyond the control of the household.

There is another important takeaway. Computing a single measure of poverty, whether through combining a number of deprivations or certain categories of household expenditure, can be highly subjective and therefore problematic. In the analysis carried out in this paper, using actual expenditure data on different items, alternative poverty estimates have been calculated based on what is included in the consumption baskets of households. This also involves a value judgment, but not one which combines a number of different dimensions that, when taken together, constitute a single measure of poverty.

We have presented four sets of estimates. Which one should be chosen or which one is considered appropriate depends entirely on the parameters used to define poverty that, in turn, may vary according to the precise objective of the exercise at hand; whether only in terms of calories derived from food consumption, or whether as a combination of calorie intake and other non-food items. The latter can include only essential items required for daily household needs, such as clothing, bedding, footwear, conveyance and fuel. It can be expanded to include health and education, as also other expenditure on goods and services, some of which may not be deemed essential. The required expenditure on these items is based on a normative minimum, as discussed in the paper. The rural poverty estimates at the all-India level in 2011–12, based on these four counterfactual scenarios, range from as low as 2.6% through 24.4% and 28.6% to as high as 51.1%. Estimates at the state level also largely conform to this pattern and span a wide range.

Last, but not least, the way of defining food poverty needs to be re-examined. In 2011–12, poverty estimates based on a calorie norm of 2,200 calories per capita per day are as high as 77% for India as a whole, and for several states, suggesting a dramatic increase in the proportion of the poor, in contrast to all estimates so far which show a decline in poverty over time. This is not surprising because estimates of poverty based on calories are very sensitive to the intake of cereals and there was a significant decline in the consumption of cereals between 1993–94 and 2011–12, as documented in this paper.

Traditionally, cereals would form a large part of the food basket of the rural poor given that cereals are the cheapest way of getting adequate nutrition in terms of calories. It has also been the staple food of Indians—whether wheat, rice or other cereals—for centuries.

It has been argued that the need for calories has diminished over time due to a lower level of physical activity and an overall improvement in the health status. If this is the case, the calorie norm may need to be revised downward.

Furthermore, it does not seem obvious that poverty estimation based on calorie requirement captures the nutritional status of a population. Dietary diversification, away from cereals and towards other food items, may reduce calorie intake but not nutrition. Hence, there is clearly a need for correlating the calorie-based poverty ratio with other indicators of poverty, including data on nutritional status that is available from the NFHS as well as data on anthropometric measurement, from other sources.

NOTES

- The cost of school attendance is derived from the NSSO employment and unemployment survey; healthcare costs are calculated from the NSSO Morbidity and Healthcare survey; and prices for the remainder of households' consumption bundles are derived from the price data underlying the CPI agricultural labour and CPI industrial workers.
- The well-established stylised fact of a downward sloping relationship between household income and the share of total expenditure on food.
- Although 2,400 calories was the original official rural norm, it was lowered in actual application to 2,200 calories for the first official estimate itself.
- These estimates are based on the uniform recall period (URP) distribution. The mixed recall period (MRP) distribution for 2009–10 gives the same ratios; poverty is found to have risen.
- In doing so, we use the uniform 30-day recall period (URP) data to maintain comparability with earlier years. While the overall average expenditure differs compared to the mixed recall period (MRP) and modified mixed recall period (MMRP) the derived poverty headcount ratios will be the same since the poverty lines for each distribution are correspondingly altered (Patnaik 2010).
- In 2004–05, the corresponding expenditure on cereals was 18%.
- Estimates available with the author.
- "Extremely Poor" have a monthly per capita consumer expenditure of up to three-fourths of the official poverty line (that is, an average of ₹8.9 per capita per day in 2004–05); "Poor" are those between the Extremely Poor and up to the official poverty line (average expenditure of ₹11.6 per capita per day); "Marginally Poor" with per capita consumer expenditure of 1.25 times the poverty line (that is, ₹14.6 per capita per day); and the "Vulnerable" have per capita consumer expenditure of two times the poverty line (that is, ₹20.3 per capita per day).
- In the case of "other food," the implicit price is a simple average of all relevant implicit prices.
- For all state-level results, the decile group which meets the prescribed calorie norms has computed separately for each state.
- Motorised two/three/four-wheeler/fishing boat; mechanised three-four wheeler agricultural equipment; Kisan Credit Card with credit limit of over ₹50,000; household member government employee; households with non-agricultural enterprises registered with government; any household member earning more than ₹10,000 per month; paying income tax; paying professional tax; three or more rooms with pucca walls and roof; owns a refrigerator; owns landline phone; owns more than 2.5 acres of irrigated land with one irrigation equipment; owns five acres or more of irrigated land for two or more crop seasons; owns at least 7.5 acres of land with at least one piece of irrigation equipment.

- "Households with one or less room, kuccha walls and kuccha roof"; "no adult member in household between age 18 and 59"; "female headed household with no adult male member between 16 and 59"; "households with differently able member with no other able-bodied adult member"; "SC/ST households"; "households with no literate adult above age 25 years"; and "landless households deriving a major part of their income from manual labour."
- Since the National Family Health Survey covered only households with a woman aged 15–49 years with at least one child aged below five years, the same group was considered in the NSSO unit-level data.

REFERENCES

- Alagh, Y K (2010): "Estimation of Poverty and Identifying the Poor," *Indian Journal of Human Development*, Vol 4, No 1, pp 33–44.
- Alkire, Sabina and Suman Seth (2009): "Measuring Multidimensional Poverty in India: A New Proposal," OPHI Working Paper No 15, September, Oxford Poverty & Human Development Initiative (OPHI), Oxford Department of International Development, University of Oxford.
- Almas, I, A Kjelsrud and R Somanathan (2013): "A Behaviour-based Approach to the Estimation of Poverty in India," Centre for Development Economics Working Paper No 226, Delhi School of Economics, University of Delhi.
- Banerjee, A and E Duflo (2011): "More Than 1 Billion People Are Hungry in the World. But What if the Experts Are Wrong?" *Foreign Policy*, <http://foreignpolicy.com/2011/04/25/more-than-1-billion-people-are-hungry-in-the-world/>.
- Basole, Amit and Deepankar Basu (2012): "The Calorie Consumption Puzzle in India: An Empirical Investigation," Political Economy Research Institute, Working Paper 285.
- (2015a): "Fuelling Calorie Intake Decline: Household-Level Evidence from Rural India," *World Development*, Vol 68, April, pp 82–95.
- (2015b): "Non-Food Expenditures and Consumption Inequality in India," *Economic & Political Weekly*, Vol 1, No 36.
- Chandrasekhar, CP and J Ghosh (2003): "The Calorie Consumption Puzzle," *Hindu Business Line*, 11 February, <http://www.thehindubusinessline.in/2003/02/11/stories/2003021100210900.htm>.
- Deaton, A (2003): "Price and Poverty in India, 1987–2000," *Economic & Political Weekly*, Vol 38, No 4, pp 362–68.
- (2008): "Price Trends in India and Their Implications for Measuring Poverty," *Economic & Political Weekly*, Vol 43, No 6, pp 43–49.
- Deaton, A and A Tarozzi (2000): "Prices and Poverty in India," Research Program in Development Studies, Princeton University, July.
- Deaton, A and J Dreze (2009): "Nutrition in India: Facts and Interpretations," *Economic & Political Weekly*, Vol 44, No 7, pp 42–65.

- Eli, S and N Li (2012): "Can Caloric Needs Explain the Food Consumption Puzzle? Evidence from India," https://www.dartmouth.edu/~neudc-2012/docs/paper_263.pdf.
- Gaiha, R, R Jha and V S Kulkarni (2010): "Affluence, Obesity and Non-communicable Diseases in India," ASARC Working Paper 2010/08, Australia South Asia Research Center, Arndt-Corden Division of Economics, Australian National University.
- Gaiha, R, N Kaicker, K Imai, V S Kulkarni and G Thapa (2013): "Has Dietary Transition Slowed in India? An Analysis Based on the 50th, 61st, and 66th Rounds of the National Sample Survey," International Fund for Agricultural Development, 16 Occasional Papers.
- Government of India (2007): *Report on Conditions of Work and Promotion of Livelihoods in the Unorganised Sector*, National Commission for Enterprises in the Unorganised Sector, New Delhi.
- (2014): *Report of the Expert Group to Review the Methodology for Measurement of Poverty*, Planning Commission, Chairperson C Rangarajan, Government of India, June.
- Landy, F (2009): "India, Cultural Diversity and the Model of Food Transition," *Economic & Political Weekly*, Vol 44, No 20, pp 59–61.
- Mehta, J and S Venkatraman (2000): "Poverty Statistics: Bermicide's Feast," *Economic & Political Weekly*, Vol 35, No 27, 2377–79.
- Mittal, S (2007): "What Affects Changes in Cereal Consumption?" *Economic & Political Weekly*, Vol 42, No 5, 444–47.
- Nayyar, Rohini (1992): *Rural Poverty in India*, New Delhi: Oxford University Press.
- Patnaik, Utsa (2007): "Neoliberalism and Rural Poverty in India," *Economic & Political Weekly*, Vol 42, No 30, pp 3132–50.
- (2010): "A Critical Look at Some Propositions on Consumption and Poverty," *Economic & Political Weekly*, Vol 45, No 10, 74–80.
- (2013): "Poverty Trends in India 2004–05 to 2009–10: Updating Poverty Estimates and Comparing Official Figures," *Economic & Political Weekly*, Vol 48, No 40, pp 43–58.
- Radhakrishna, R (2015): "Well-being, Inequality, Poverty and Pathways Out of Poverty in India," *Economic & Political Weekly*, Vol 50, No 41, pp 59–71.
- Rao, C H H (2000): "What Affects Changes in Cereal Consumption?" *Economic & Political Weekly*, Vol 35, No 4, 201–06.
- Raveendran, G (2010): "New Estimates of Poverty in India: A Critique of the Tendulkar Committee Report," *Indian Journal of Human Development*, Vol 4, No 1, pp 75–89.
- Sen, P (2005): "Of Calories and Things: Reflections on Nutritional Norms, Poverty Lines and Consumption Behaviour in India," *Economic & Political Weekly*, Vol 40, No 43, pp 4611–18.
- Smith, L C (2013): "The Great Indian Calorie Debate: Explaining Rising Undernourishment during India's Rapid Economic Growth," Institute of Development Studies Working Paper 430, Sussex.