

Identifying BPL Households

A Comparison of Methods

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Exercises to identify households living below the poverty line have taken place three times, and a fourth one is under way. Though the latest method aims to improve upon previous methods, its empirical implications and precise justification are not yet clear. This paper empirically examines the Socio-Economic Caste Census methodology and compares it empirically with alternative proposals to show the choice of a particular methodology matters. It also points out how state-level BPL poverty caps will vary if they reflect multiple deprivations such as malnutrition and housing rather than only expenditure-based poverty rates.

1 Introduction

The Indian government conducted below the poverty line (BPL) censuses in 1992, 1997 and 2002 to identify households that were eligible for certain benefits, and a fourth census, known as the Socio-Economic Caste Census (SECC 2011), is currently under way.¹ A household that is identified as BPL is entitled to receive a BPL card. BPL-related benefits vary by state, but may include subsidised food, schemes to construct housing, and self-employment activities. In 2002, households were identified as BPL using a 13-item census questionnaire, but the 2002 BPL identification exercise was severely criticised for corruption, low data quality and coverage, imprecise scoring methods, and poor survey design (Sundaram 2003; Hirway 2003; Jain 2004; Mukherjee 2005; Jalan and Murgai 2007; Alkire and Seth 2008; Saxena 2009; Roy 2011; Alkire and Seth 2012). The SECC 2011 Census questions are argued to be easy to answer, easy to verify, and not to create perverse incentives. The SECC 2011 also outlines an alternative identification method (GOI 2011a). It aims to correct the large targeting errors observed in the BPL 2002 exercise by introducing different exclusion and inclusion criteria, indicators, and scoring methods. But is the SECC's proposal the most accurate identification method possible using the 2011 Census questions? This article explores that question empirically.

For the fourth BPL identification exercise, alternative targeting methodologies were proposed and debated. The Ministry of Rural Development (MORD) appointed an expert group committee chaired by N C Saxena, to propose a new methodology for identifying BPL households. The committee recommended a three-step method (Saxena 2009) – automatically exclude those that satisfy certain exclusion criteria; then automatically include those that satisfy certain inclusion criteria; and identify the rest of the BPL recipients using a 0-10 scoring method based on a weighted sum of key census questions. The order of exclusion and inclusion can be debated, and the exclusion and the inclusion criteria can be variously combined to identify the BPL poor (Drèze and Khera 2010). Similarly, the Saxena inclusion and exclusion criteria and scoring method might be altered – as indeed was done in the SECC 2011 (GOI 2011a) and in other documents.² But on what ground should such changes be assessed?

A number of empirical studies have been conducted that explore the divergent proposals for the new BPL exercise empirically (Himanshu and Murgai 2011; Roy 2011; Sharan 2011). Himanshu and Murgai (2011) analyse the pilot census for SECC

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2011 and find that an extended set of exclusion criteria would automatically exclude 28% of the rural population compared to only 8.3% by the set of exclusion criteria proposed by Saxena. Roy (2011) compares the 2002 BPL methodology and the Saxena proposal using the survey data from 18 wards of four gram panchayats in two districts in West Bengal and Bihar, and finds Saxena to be more accurate. For example, nearly 30% of casual worker households in 18 rural wards of Bihar would have been wrongly excluded if BPL 2002 methodology were used in place of Saxena (2009). Sharan (2011) compares the proposal of Saxena (2009) to the exclusion-inclusion approach of Drèze and Khera (2010) using a study on five villages and 469 households in Udupi district of Karnataka and finds the exclusion-inclusion approach to be more transparent and much faster.

This paper compares three identification methods that use both the exclusion-inclusion criteria and a scoring method to identify the poor – SECC 2011, Saxena (2009), and an alternative method. Unlike the previously mentioned studies, our analysis is representative at the national level. We outline the data used for analysis in Section 2. Section 3 presents results, comparing combined exclusion and scoring methods, and each of these separately. Section 4 shows that a better fit may be obtained by a 10-item binary scoring method using the variables that have already been introduced in the SECC questionnaire. Section 5 explores state-level caps. Section 6 concludes.

2 Data

In this paper we use the third round of the National Family Health Survey (NFHS-3) data set for 2005-06 to complement other studies that have used National Sample Survey (NSS) data, the BPL pilot data, and special small surveys.³ In a companion paper (Alkire and Seth 2012), we also use the NFHS-3 to show which of these BPL-identification methods best proxy a multi-dimensional measure of poverty, which includes anthropometric data on under-nutrition (undoubtedly one of the most salient deprivations for BPL identification), as well as child mortality, water, sanitation, and other variables.

The NFHS-3 data set is nationally representative and representative of all 28 states and the union territory of Delhi. This paper focuses on rural households and their members in 28 states. In our analysis, we use certain information on individual characteristics – such as occupational status – that are not available for all household members. Our final sample contains 49,209 households with information available for all

household and individual characteristics of our interest. Our final sample size represents 84.5% of rural households from 28 Indian states and covers 91.1% of the rural population in India when sampling weights are applied.⁴

3 Do Different Methods Identify the Same Beneficiaries?

This section explains how we match NFHS-3 criteria to the BPL methodological proposals, and presents our results, which show that relatively minor methodological differences lead to the identification of different sets of poor households.

Matching the Criteria to NFHS-3

To compare the methodologies, we match the criteria using the NFHS-3 data set for rural households,⁵ and compare three methods by applying respective pseudo-criteria. This is similar in spirit to our earlier work (Alkire and Seth 2008).

Table 1: The Pseudo-Criteria for Saxena (2009) and the Alternative Method

No	Criteria from NHFS-3	Saxena Committee	Alternative Method	Percentage of Households
1a	Household having double the land than the PSU average if the land is irrigated or three times the PSU average if it is unirrigated	Exclusion	-	5.6
1b	Household having at least two hectares of agricultural land	-	Exclusion	10.5
2	Household owning a car	Exclusion	Exclusion	1.0
3a	Household owning a thrasher or a tractor	Exclusion	-	4.0
3b	Household owning a tractor	-	Exclusion	2.5
4	Any member of the household having health insurance and the household not falling in the bottom two quintiles of the wealth score	Exclusion	Exclusion	2.4
5	Household headed by a single woman	Inclusion	4	12.0
6	Household headed by a minor	Inclusion	0	0.3
7	Any member of the household being a bonded labourer	Inclusion	4	0.2
8	Household being considered as destitute	Inclusion	4	0.4
9	Household being scheduled caste (SC)/scheduled tribe (ST)	3	3	31.2
10	Household being Muslim/Other Backward Class (OBC)	1	1.5	48.5
11	Any member in the household having tuberculosis	1	2	2.4
12	Household headed by an old person	1	2	16.3
13	Primary occupation of the household is landless agricultural labour	4	3.5	12.2
14	Primary occupation of the household is share cropping	4	3	3.3
15	Primary occupation of the household is artisan or casual work	2	3	8.3
16	Primary occupation of the household is marginal farmer	0	3	4.2
17	Primary occupation of the household is small farmer	0	2.5	6.0
18	Primary occupation of the household is agricultural labour and the households own some land	3	0	10.5
19	No household member (older than 30 years) studied up to class 5	1	0	45.5
	Households excluded by Saxena (2009)			10.9
	Households excluded by alternative method			13.9

Table 1 provides an overview of how we have matched BPL criteria using the NFHS-3 data set. The second column lists the indicators we were able to match. The next two columns report the type of the criteria – exclusion or inclusion – or the score structures. The last column reports the proportion of households that satisfy the respective indicators. Saxena (2009) and the alternative method proposed five exclusion criteria (Appendix 1, p 57). NFHS-3 data are only able to closely match three exclusion criteria for Saxena and two for the alternative. They could not match two exclusion criteria – having household income of more than Rs 10,000 and having paid income tax. We use a fourth indicator in Table 1 as a proxy for both of these indicators, which is the type of health insurance that any

members of a household receive from different sources.⁶ This fourth exclusion criterion excludes 2.4% of rural households, which is more or less of the right magnitude because less than 3% of the Indian population pays income tax (Piketty and Qian 2009), and this rate will be even lower in rural areas. Also, the per capita expenditure of the top 10% of the rural population in 2007-08 was just above Rs 1,229 per month (GoI 2010). We conjecture that the fraction of households with one member earning Rs 10,000 or more would be much lower. Hence, the fraction of households excluded by the final two exclusion criteria of Saxena (2009) would not be too different to the fraction of households excluded on the basis of the health insurance information, although, importantly, they might not necessarily be the same households.

The next four criteria in Table 1 are called inclusion criteria. Any household satisfying these criteria must be automatically identified as BPL. We were able to match only four of the eight inclusion criteria listed in Panel A of Appendix 1 because the NFHS-3 does not identify households in the Maha-Dalit groups, households with a disabled person as bread-earner, and those that are homeless. We have been able to identify those headed by single women or minors, but the identification of destitute and bonded labourers is not straightforward. We identify a household as destitute if both the respondent and her partner (if available) are unemployed, own less than 0.5 hectare of land (irrigated or unirrigated), and fall in the bottom two quintiles of the wealth index.⁷ Similarly, we proxy the indicator “bonded labourer” using NFHS-3 information that an adult member, male or female, is working as an agricultural labourer on someone else’s land without being paid in cash.

Implementing the matched exclusion criteria using NFHS data, the Saxena exclusion criteria exclude 10.9% of households, whereas the alternative exclusion criteria exclude 13.9% of households.

The rest of the households are identified according to their weighted deprivation scores. We were able to match most of the scoring indicators, including scheduled castes, scheduled tribes and Muslims and Other Backward Classes. We could only identify households in which a member had tuberculosis, but could not identify leprosy, disability, mental illness, or HIV/AIDS. Criteria 13-18 are based on occupational categories that are only available for the respondents and their partners (if available), not for the entire household.⁸ The final criterion on education could be matched easily; 45.4% of households in rural India have no member older than 30 years who has completed five years of schooling.⁹

Table 2 shows how we approximate the exclusion criteria and scoring indicators for the SECC 2011 listed in Panel c of Appendix 1. The first six exclusion criteria are straightforwardly matched, while the last two are imperfect proxies. Criterion 7 is the same as criterion 4 in Table 1. Criterion 8 is used as a proxy for high-profile jobs. We assume that having someone in a professional, managerial, or technical position makes a household ineligible. The exclusion criteria require that households satisfying any one of these eight criteria be excluded from BPL cards and excludes 24.3% of rural households,

compared to 10.9% and 13.9% by the other methods. This is only slightly less than the 28% that Himanshu and Murgai (2011) found using the BPL pilot data set.

Although the NFHS-3 data set contains information on the extent of landownership, it does not contain information on the ownership of irrigation equipment or number of crop seasons. This information is required to implement SECC exclusion criteria x, xi, and xii in Panel c of Appendix 1. Excluding households based solely on landownership may lead to large errors, so we omit land-based exclusion indicators in the main analysis. However, we check the robustness of our results using three alternative land-exclusion criteria – a household is excluded if (1) it owns at least 2.5 acres of irrigated land or 7.5 acres of any agricultural land; (2) it owns at least 5 acres of irrigated land or 7.5 acres of any agricultural land; and (3) it owns at least 7.5 acres of agricultural land. Addition of the first land-exclusion criteria to the eight exclusion criteria listed in Table 2 excludes 30.6% of rural households. Similarly, the addition of the second and third land-exclusion criteria to the eight exclusion criteria listed in Table 2 exclude 27.2% and 25.8% rural households, respectively.

Table 2: The Matched Exclusion Criteria and Scoring Indicators of the SECC 2011

No	Criteria	Type of Criteria/ indicators	Percentage of Households
1	Has a four-wheeler, car or jeep	Exclusion	1.0
2	Has a tractor or a thrasher	Exclusion	4.0
3	The housing is pucca with more than 3 bedrooms	Exclusion	2.2
4	The household has a refrigerator	Exclusion	6.8
5	The household has a phone	Exclusion	8.2
6	Has a motorised cycle	Exclusion	11.6
7	If the household has health insurance	Exclusion	2.4
8	The respondent or her partner works in a professional, managerial, or technical position	Exclusion	6.4
9	Any member of the household being a bonded labourer	Inclusion	0.2
10	Household being considered as destitute	Inclusion	0.4
11	Households with only one room kutch house	Scoring	12.5
12	No adult member between the ages 16 and 59	Scoring	0.1
13	Female headed households with no adult male member between 16 and 59	Scoring	7.7
14	Any household member with tuberculosis	Scoring	2.4
15	Scheduled caste/scheduled tribe households	Scoring	31.2
16	Households with no literate adult above 25 years	Scoring	34.3
17	Primary occupation of the household is manual labour and owns no land	Scoring	23.2
	Households being excluded by the exclusion criteria		24.3

Among the five inclusion criteria of SECC 2011, we have been able to match only two (criteria 9 and 10 in Table 2), which are the same as criteria 7 and 8 in Table 1. We have been able to match six of the seven scoring indicators of SECC 2011. The criterion that we have not been able to match is disability. We have used a very imperfect proxy that attaches a score of one if there is any member in the household with tuberculosis – this has a low incidence at 2.4%.¹⁰ Recall from Appendix 1 that an indicator including tuberculosis had been proposed by Saxena (2009) while scoring the households, hence our use of it.

Because the matches are imperfect and because the NFHS-3 data are for 2005-06, the following results are only illustrative, but will provide some approximation of the differences

between methodologies, and signal issues that can be further scrutinised.

Households Identified as BPL by the Three Methods

In this section we compare the Saxena and alternative scoring methods, after applying the respective inclusion and exclusion criteria, and show that despite having similar criteria, the different methods identify a very different set of households. Second, we compare these two methodologies with the SECC 2011 methodology using a three-way Venn-diagram and show how all three methods overlap and diverge.

For our first exercise, we select four different poverty caps. The selection of national poverty caps in the BPL context has been hotly debated because different measures identify a different number of people as poor. For example, the rural expenditure-based poverty headcount ratio in 2009-10 is 33.8% (GoI 2011b), whereas the rural acute multidimensional poverty headcount ratio in 2005-06 was 66.6% (Alkire, Roche and Seth 2011). Saxena (2009) recommended at least 50% of the rural population be identified as BPL. Sengupta (2007) argued that nationally 76.6% of the population in 2004-05 was poor; the figure would have been larger for rural areas. As we illustrate below, if the global Multidimensional Poverty Index (MPI) uses a lower poverty cut-off such that 75% of rural households are BPL nationally, state-level caps vary from 25% to 94%. So our four sets of caps fall within this range.

Table 3: Identification of BPL Poor by Saxena (2009) and the Alternative Method

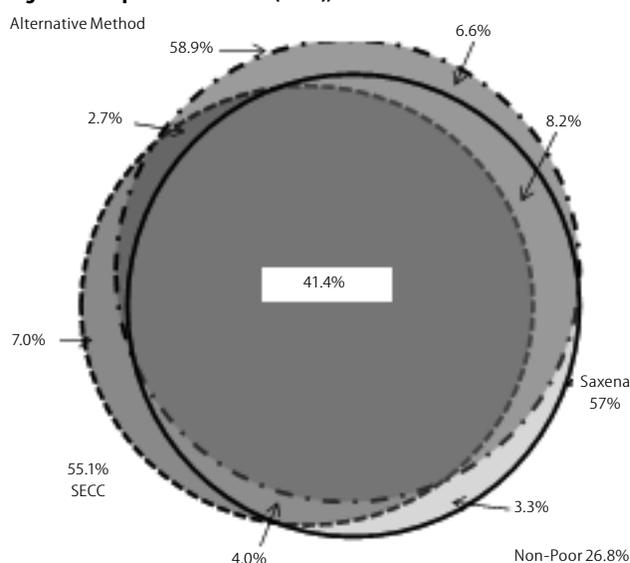
Poverty Cap (%)	S-Poor (%)	A-Poor (%)	S-Poor & A-Poor (%)	S-Poor or A-Poor, But Not Both (%)
35-36	35.5	35.1	26.9	16.7
45-47	46.5	45.6	33.5	25.1
56-59	57.0	58.9	49.6	16.6
78-83	82.5	78.5	75.5	10.1

We select the poverty cut-offs so that the Saxena method and the alternative scoring method each identify a similar proportion of poor households. We cannot match the headcount ratios precisely because of the bunching in the scoring distribution. Our intention is clear though. We compare which households each approach would identify as BPL if different fractions of households were to be selected as BPL poor after applying the respective exclusion and inclusion criteria. If the scoring structure did not matter much, the same households would more or less be identified by both methods and for all fractional cut-offs. We find, however, quite a different story.

Using a simple cross tabulation of the rural households, in Table 3 we see how these two methods agree or disagree. Four different poverty caps are reported in the first column. We refer to the poor identified by the Saxena method as s-poor and those by the alternative method as a-poor. The second and third columns report different percentages of households identified as BPL. The fourth column reports the percentage of households who are BPL by both methods. The fifth column reports the percentage of households that are only either s-poor or a-poor – in other words, the percentage of households for which both methods disagree.

When the poverty cap is 35%-36%, both methods agree on 26.9% of households, but disagree on 16.7%. When the poverty cap is around 45%-47%, both methods agree on 33.5% households, but disagree on 25.1% of rural households. An interesting point to note here is that the disagreement increases more sharply than the agreement – 16.7% to 25.1%. When the poverty cap is between 56% and 59%, both methods agree regarding 49.5% of households and disagree on 16.6%. When the poverty cap is around 78%-83% (state-level MPI caps would have been above 78% for eight states in 2005-06), both methods agree on nearly 75.5% of all households, and diverge on 10.1% – by far the best agreement. What this means is that if both methods are reasonable, targeting errors are likely to be largest in those states having somewhat lower poverty caps, and lower in the poorest states.

Figure 1: Comparison of Saxena (2009), Alternative and SECC 2011 Methods



Now, we compare the Saxena and the alternative scoring method to the SECC 2011 scoring method, after applying the corresponding exclusion and inclusion criteria for each of the three methods. It would have been interesting to match these three methods for several poverty caps, but we must use one poverty cap because bunching in pseudo-SECC scoring does not permit us to identify more than 55% of rural households as BPL at the national level.¹¹ Figure 1 compares the three methods using a three-way Venn diagram. When these three methods identify between 55% and 59% of households as BPL, they all agree that 41.4% of households are BPL, and that 26.8% are above the poverty line (APL). The remaining 31.8% of rural households are identified as BPL by one or two methods but not by all three. If we just compare SECC 2011 and Saxena (2009), they both identify only 45.4% of households as BPL; 21.2% of the households are identified as BPL by only one method, not by both.

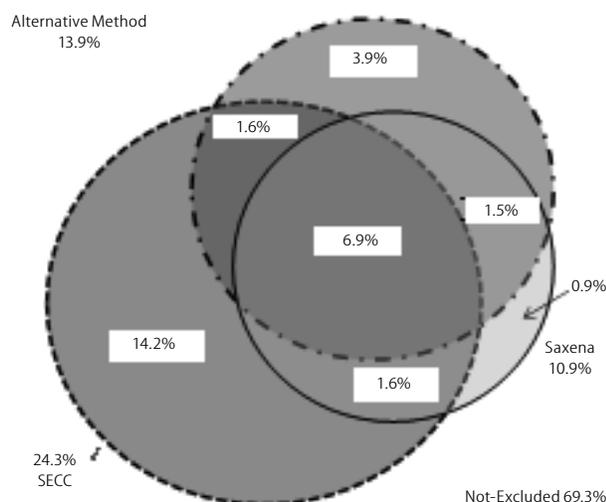
Households Excluded by the Three Methods

Next, we explore whether different sets of households are disqualified by different exclusion criteria. The Saxena recommendations were tested using a pilot SECC census, and findings from 161 villages across India were analysed by Himanshu

and Murgai (2011), who found that nearly 8.3% of the national rural population would have been automatically excluded. The extended exclusion criteria proposed in the SECC 2011, they found, would exclude nearly 28% of the national rural population. We explore whether the households excluded by the Saxena (2009) criteria are a subset of households excluded by the SECC exclusion criteria. If they are not a subset, even the use of exclusion criteria would require careful scrutiny. We undertake this exercise using the NFHS-3 data and compare the results with the alternative exclusion criteria.

What appears from Figure 2 is that while it might seem appealing to rely only on slightly more extensive exclusion criteria to identify BPL households, exclusion criteria are not necessarily unproblematic. The Venn diagram in Figure 2 shows that 30.7% of households are excluded by any one set of exclusion criteria. But the three methods only agree to the exclusion of 6.9% of rural households. Let us first compare the Saxena exclusion criteria, which exclude 10.9% of households, and the alternative exclusion criteria, which exclude 13.9% of households. They agree on only 8.4% of households and disagree on 8%, where only one of them identifies a household as poor and not the other.

Figure 2: Comparison of Excluded Households by the SECC 2011 Method with Saxena (2009) and Alternative Methods



Let us compare the SECC exclusion criteria to the two other methods. Naturally, the matches will be more imperfect because the percentage of excluded households is much higher for the SECC 2011 (24.3% versus 10.9% or 13.9%). Out of the 24.3% households excluded by the SECC criteria, 58.5% – 14.2% of rural households – would not have been excluded by either Saxena or the alternative method. Further, there is active disagreement about whether these 14.2% of rural households should be excluded or whether some are actually BPL. For example, 2% of all rural households were automatically excluded by the SECC criteria, but would have had been automatically included as BPL by the Saxena criteria.¹² Also, 4.2% of all rural households were automatically excluded by the SECC criteria, but would have scored three or more by the Saxena scoring. They would have been identified as BPL if, nationally, at least 57% of people were identified as BPL. We reported elsewhere (Alkire and Seth 2012), that 6.4% of all rural households would

have been “excluded” by the first six SECC exclusion criteria, but would also have been poor according to the MPI. Of these, 76.9% have at least one undernourished woman or child, 78.9% do not have improved sanitation facilities, 91.9% use unimproved cooking fuel, and 56% do not live in houses with improved floor material. Thus at a conservative estimate, up to a quarter of those excluded by the SECC criteria could have been BPL by various other criteria. So even if exclusion criteria alone are used, they need to be closely scrutinised and carefully justified, particularly if they are to be uniformly applied across all rural areas and if all information on “inclusion” criteria is to be disregarded.

In summary, there can be significant disagreement over the identification of the poor when the score structures differ. Also, distinct sets of exclusion criteria identify different households as BPL. Of particular concern is when exclusion criteria are alone implemented, households that would have been identified as BPL on other grounds may be excluded. In other words, the selection of criteria, sequence, and score structure all matter. Although we could not match the proposed criteria exactly, and although the NFHS-3 data set did not allow us to set caps at the district level, the results indicate a need for empirical analysis to complement political and qualitative inputs into targeting methods because methodological differences generate different results.

4 Precision and Bunching

As discussed earlier, the SECC 2011 census is conducted in three stages – automatic exclusion, automatic inclusion, and scoring. Matching the SECC exclusion criteria as closely as possible using NFHS-3, we have seen that nearly 24.3% of households were automatically excluded. Although we could not proxy all automatic inclusion criteria, these criteria are quite specific and each identifies relatively few rural households. Therefore, in states having lower poverty caps, additional BPL households must be identified using the third stage of the method, which relies on household scores. However, the SECC 2011 method uses only seven indicators, which cause bunching in scoring.¹³ In other words, those particular seven items do not provide enough variation in deprivation counts to be able to match state poverty caps precisely.

Figure 3: The Bunching of Scores for the SECC 2011 Criteria

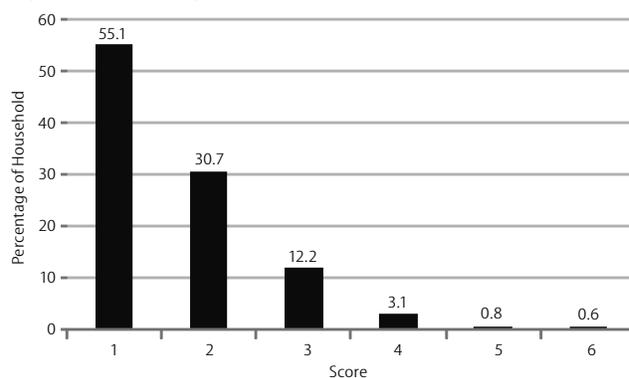


Figure 3 plots the score distribution for the seven SECC 2011 criteria that we have been able to match. The horizontal axis

reports the score and the vertical axis reports the percentage of households that have that score or more. It is evident that 55.1% of households are identified as BPL if their score is at least one. Only 30.7% of the households experience two deprivations, and only 12.2% experience three deprivations. There are no households with a score of seven and only a very few households with scores of five and six. This makes the scoring system quite imprecise. For example, if a state government, informed by budgetary constraints, decides to target 45% of households, then 30.6% could be identified because they have a score of two, but the remaining 15% – one-third of all BPL households – would need to be identified using a fourth stage with additional criteria, which would incur further costs and may not improve accuracy.

One way of addressing this situation is by increasing the number of indicators for scoring, and ensuring that the indicators used are such as to provide a relatively more even – and accurate – reflection of the intensity of poverty across sampled households. For instance, a 10-item binary criteria score using SECC variables allows greater precision (Alkire and Seth 2012). Table 4 reports the 10 criteria. The deprivation score of each household is the number (“count”) of deprivations that each household faces. So a household’s deprivation score ranges from zero to 10. Each of these 10 criteria is contained in the SECC questionnaire.

Panel I of Figure 4 plots the distribution of household scores that are obtained using the 10-item binary scoring indicators and after applying the SECC 2011 exclusion criteria. It can be seen that bunching is partially mitigated as the differences of the percentage of potential BPL poor is much lower between score categories. The percentage of people between score

equal to one and score equal to two is less than 10 percentage points. The differences between scores equal to two versus three, and three versus four are between 13 and 16 percentage points. If we use the scoring indicators without first implementing the exclusion criteria (Panel II), the bunching in scoring is still lower than the SECC method.

5 Poverty Caps

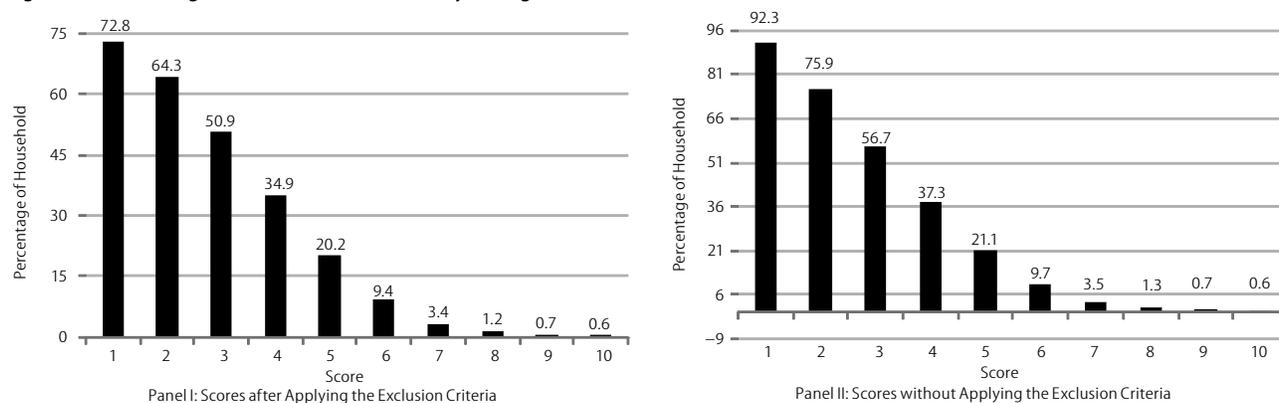
A final crucial concern is how accurate it is to set the state poverty cap using national estimates of consumption poverty. Which levels of poverty should be used to cap the percentage of BPL households by district or state and union territory? Naturally, states are free to increase their caps, as some states (Kerala and Tamil Nadu) already do.¹⁸

In both BPL 2002 and SECC 2011, the poverty caps reflected the Planning Commission’s expenditure-based poverty estimate, but this approach has been criticised for lacking any justification (Hirway 2003). It is assumed, implicitly, that a multi-dimensional measure of direct deprivation would provide similar levels of poverty caps to an expenditure-based measure. How accurate might this assumption be? Ideally such a comparison would use a national MPI, but to illustrate the issue, we compare the expenditure-based poverty headcount ratios of the Tendulkar Committee (Tendulkar 2009) to state-wise headcount ratios of an international MPI that has been implemented for India and other countries (Alkire and Santos 2010). Nationally, 66.6% of the rural population is identified as poor according to the global MPI, where a person is identified as poor if he or she is deprived in at least one-third of the weighted indicators (often written as $k = 0.333$). In contrast, if we look at expenditure poverty from the nearest year, 41.8% of

Table 4: The 10-Item Binary Scoring Indicators

No	Indicator	Definition of Indicator	Deprived (%)
1	Landlessness	1 if household is landless; 0 otherwise	40.7
2	Housing (wall)	1 if the roof of the house is built with unimproved material; 0 otherwise ¹⁴	45.7
3	Housing (roof)	1 if the wall of the house is built with unimproved material; 0 otherwise ¹⁵	27.8
4	Community	1 if household is SC/ST; 0 otherwise	31.2
5	Singleness	1 if household head is a single woman, a minor, or elderly, and there is no adult male in age group 16-59; 0 otherwise ¹⁶	9.9
6	Occupation	1 if any household member is engaged as a plantation labourer, casual labourer, or agricultural labourer; 0 otherwise	49.9
7	Education	1 if no household member is educated beyond class 4; 0 otherwise	30.1
8	Disability	1 if any household member has tuberculosis; 0 otherwise	2.4
9	Over-crowding	1 if three or more members live per bedroom, 0 otherwise	48.3
10	Dependency	1 if the child plus elderly-to-adult ratio is larger than two; 0 otherwise ¹⁷	8.8

Figure 4: The Bunching of Scores for the 10-Item Binary Scoring Indicators



the rural population was identified as poor by the Tendulkar Committee in 2004-05. How would the state poverty caps of these two methods differ? We implement two new multidimensional poverty cut-offs – a cut-off of 40% (or $k = 0.4$), which generates a national rural multidimensional poverty headcount of 48% – closer to the Tendulkar rural poverty rates in 2004-05; and a cut-off of 25% (or $k = 0.25$), which corresponds to a national rural cap of around 75%. The objective of the first poverty cut-off ($k = 0.4$) is to compare the state-level multidimensional poverty caps with those that would be set by the Tendulkar method, and of the second poverty cut-off ($k = 0.25$) is to show how many people would be identified as poor across states if a higher rural poverty cut-off were selected.

Figure 5: Rural Poverty Headcount Ratios across 19 States by Tendulkar (2009) and the MPI Constructed Using Poverty Cut-offs k of 25% and 40%

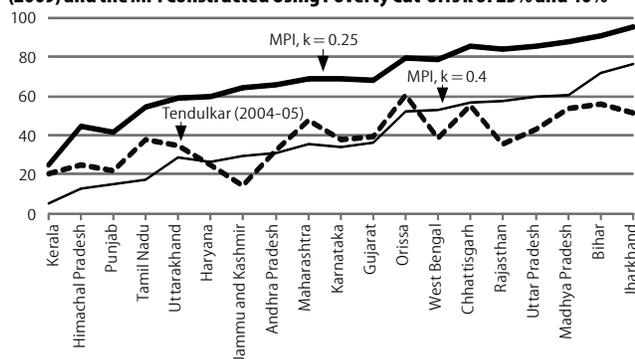


Figure 5 plots the Tendulkar committee's rural expenditure-based poverty headcount ratios for the year 2004-05 and the headcount indices of multidimensional poverty estimated from the NFHS-3 data set for 19 major states of India. The states are ranked by the MPI for $k = 0.4$. It shows us that the state caps differ somewhat between the Tendulkar method and the Alkire-Santos method ($k = 0.4$) with the Kendall's tau rank correlation coefficient being only 0.62. Multidimensional poverty is lower than consumption poverty for least poor states such as Kerala, Himachal Pradesh, Punjab, Tamil Nadu and Uttarakhand, and higher in the poorest states such as Rajasthan, Uttar Pradesh, Madhya Pradesh, Bihar and Jharkhand. A mixed picture is found for the states in the middle, where the expenditure-based poverty headcount ratios jump around the multidimensional poverty headcount ratio. Thus, a measure of direct deprivation may differ from an expenditure-based

poverty measure at the state level. Hence, the poverty caps should also be justified insofar as they prove to be an accurate proxy for measures of direct deprivations that BPL benefits will address, such as undernutrition and poor housing conditions.

6 Conclusions

This paper has shown that apparently small differences in scoring structures and inclusion or exclusion criteria make large differences in identifying BPL households. Using the best feasible matches from NFHS-3 data, we compare Saxena (2009) and an alternative with the SECC 2011 BPL identification method. We find that when 55% to 58% of rural households are identified as BPL by each method, only 41.4% of households are identified as BPL by all three methods. Nearly one-third of rural households – 31.8% – are identified as BPL by some method but not by another. Second, we compare the set of households automatically excluded by three sets of proposed exclusion criteria and find a wide mismatch. Part of this was predictable due to different magnitudes of exclusion. But the surprise is that nearly a quarter of SECC-excluded households would have been included using inclusion or scoring criteria, and more than a quarter of the excluded households were multidimensionally poor. Hence any targeting method including exclusion criteria needs to be carefully justified – and we have proposed an approach by which to calibrate a targeting method (Alkire and Seth 2012).

If a scoring method is used, we note that a 10-item counting approach using SECC variables would reduce the bunching problem. Finally, we observe that if state-level poverty caps are set using a multidimensional poverty measure, which includes malnutrition, child mortality, housing, water, sanitation, and so on, state-level caps differ from caps based on expenditure poverty.

The debates between whether and how to target BPL households or provide universal coverage of certain benefits are long-standing. This paper shows that even if the SECC census data meets high quality standards, and even in the absence of corruption, the methodology used to target BPL households and fix state-level poverty caps matters – different methodologies generate different outcomes. Any final set of targeting criteria – and poverty caps – should therefore be justified carefully, probed extensively, and used self-critically.

NOTES

- 1 For a more detailed discussion on BPL methods for the years 1992 and 1997, see Saxena (2009).
- 2 To test this, we implement an alternative method is similar to that in Mehrotra and Mander (2009). The second author was a member of the Saxena Committee expert group and the first author was a former member (see Datta 2009).
- 3 For example, Jalan and Murgai (2007) use the 2004-05 NSS data set to explore the mismatch between the identification method of the third BPL census to consumption expenditure poverty.
- 4 The final sample used for our analysis is not fully nationally representative. To understand the deprivation status of dropped households, we conducted bias tests by selecting eight indicators that capture direct deprivations among

households – housing conditions, access to electricity, sanitation, clean drinking water, clean cooking fuel, asset ownership, years of schooling, and the status of children in the household (see Alkire and Seth 2012). Deprivations are significantly higher among the households in the dropped sample in housing, electricity, sanitation, clean cooking fuel, asset ownership, and years of schooling. No statistically significant difference was found in access to clean drinking water. Deprivation among children is higher in the retained rather than dropped sample. The primary reason is that the retained sample does not include households headed by old members, which tend to be smaller in size and have fewer children. This difference in the retained sample and the dropped sample will somewhat affect our

results and may under-report elder poverty. However, this does not reduce the meaningfulness of our analysis. Given that we cover 84.5% of rural households, a disagreement over say 10% of rural households in the retained sample implies a disagreement over at least 8.45% rural households in the full sample. This absolute number could not be lower even if information were available for all rural households.

- 5 The Planning Commission appointed a separate Hashim committee expert group to propose a methodology for conducting the SECC in urban areas (GOI 2011a).
- 6 The available health insurance schemes are the employees' state insurance scheme, central government health scheme, community health insurance programme, health insurance through employer, medical reimbursement from

- employer, and privately purchased and community health insurance.
- 7 We consider the bottom two quintiles because the rural income poverty headcount ratio is 41.8 or more than 40% (Tendulkar 2009). Of the 0.4% of rural households that are "destitute" by our match, 55% belong to the poorest quintile and 45% belong to the second poorest quintile.
 - 8 Note that the occupation information is available for those households where there is at least one woman in the age group of 15-49 and at least one man in the age group of 15-54. There is no occupational information for the rest of the household.
 - 9 The education variable should, in our view, be handled with caution. This is because 29.9% of households do not have one adult member (15 years or older instead of above 30 years) who has completed five or more years of education. Thus, 15.6% (45.5%-29.9%) of households would be given an extra point by Saxena (2009) only because they do not have any member older than 30 years finishing five or more years of schooling, although they do have members in the age group of 15-30 who have finished five years or more of schooling.
 - 10 As Himanshu and Murgai show, based on the pilot survey data set for SECC 2011, the proportion of households with the disability criteria would be around 5% to 6%.
 - 11 Even when the three alternative land-exclusion criteria are implemented, the maximum number of BPL poor that can be identified ranges between 52% and 55%.
 - 12 The extent of disagreement with the set of SECC exclusion criteria varies when the alternative land-exclusion criteria are added to the SECC exclusion criteria. When each of the three land-exclusion criteria is added, then all three methods exclude 8.2%, 8% and 7.3% of households, respectively. When the first land-exclusion criterion is added to the set of SECC exclusion criteria, the match between the SECC exclusion criteria and Saxena (2009) exclusion criteria improve dramatically and only 0.6% of households excluded by Saxena (2009) are not excluded by the SECC exclusion criteria. However, when each of the second and the third land-exclusion criteria is added, 1.3% and 2% of households that are excluded by Saxena (2009) are not automatically excluded by the SECC exclusion criteria, respectively. Thus, disagreement exists. However, each of these three land-exclusion criteria is not an accurate match and thus it is not possible to have any conjecture on the true extent of disagreement.
 - 13 GOI (2011b) proposes to solve the bunching problem by using the percentage of SC/ST population in the panchayats concerned.
 - 14 The roof of a house is considered unimproved if it is made of thatch/palm leaves, mud, mud and grass, plastic/polythene sheets, rustic mats, palm/bamboo, raw wood planks/timber, unburnt bricks, and loosely packed stone. Or if there is no roof.
 - 15 The wall of a house is considered unimproved if the wall is made up of cane/palm/trunks, mud, grass/reeds/thatch, bamboo with mud, stone with mud, plywood, cardboard, unburnt brick, and raw/reused wood. Or if there is no wall.
 - 16 A minor is someone who is less than 18 years old. An elderly person is a member of the household who is older than 59 years. Note that our sample does not cover all those households headed by the elderly. Or else, the headcount would have been much higher.
 - 17 A child is any member who is younger than 18 years. An elder is any member who is older than 59 years. The child and elderly to adult ratio is the ratio of the number of children and elderly members to the number of adult members in the age group 16-59 years in the household.

18 Kerala, Tamil Nadu, and other states have moved to a universal rather than targeted public distribution system. See Drèze and Sen (2011).

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Appendix I: Criteria for Identifying BPL Households Recommended by Saxena (2009), Alternative Scoring, and the Socio-Economic Caste Census (2011)

Panel A: Saxena Committee Expert Group Criteria (2009)		
First Stage (Exclusion)	Second Stage (Inclusion)	Third Stage (Scoring)
i. Families who own double the district average of agricultural land per agricultural household if partially or wholly irrigated (3 times if completely un-irrigated).	i. Designated 'Primitive Tribal Groups'	i. SC/ST: 3 points; Denotified Tribes and Designated 'Most Backward Castes': 2 points; Muslim/OBC: 1 point.
ii. Families who have three or four wheeled motorised vehicles, such as jeeps, SUVs, etc.	ii. Designated most discriminated against SC groups, called 'Maha Dalit Groups', if so identified by the state	ii. Landless agricultural worker: 4 points; agricultural labourer (with some land): 3 points; casual workers: 2 points; self-employed artisans or self-employed fisherfolk (including those employed by others in such professions): 2 points.
iii. Families who have at least one piece of mechanised farm equipment, such as a tractor, power tiller, thresher, harvester, etc.	iii. Households headed by single women	iii. No adult (above 35 years of age) has studied up to class 5 in the household: 1 point.
iv. Families who have any person who is drawing a salary of over Rs 10,000 per month in non-government/private organisations or is employed in government (including para-statal) on a regular basis with pensionary or equivalent benefits.	iv. Households with a disabled person as bread-earner	iv. Any member of the household has TB, leprosy, disability, mental illness or HIV-AIDS: 1 point.
v. Income taxpayers.	v. Households headed by a minor	v. Household headed by an old person of age 60 and above: 1 point.
	vi. Destitute households which are dependent predominantly on alms for survival	
	vii. Homeless households	
	viii. Any member of the household is bonded labourer	
Panel B: Alternative Scoring Criteria		
Occupational	Social Group	Vulnerable
i. Destitute/dependent on alms: 4	i. SC/ST: 3	i. Household headed by single woman: 4
ii. Forest gatherer: 4	ii. MBC (Designated Most Backward Castes): 1.5	ii. Disabled worker: 4
iii. Landless worker: 3.5	iii. Muslims: 1.5	iii. Bonded workers (workers or dependent): 4
iv. Tenant/sharecropper: 3	iv. Designated Primitive Tribal Group: 5	iv. Household headed by elderly person: 4
v. Marginal farmer: 3		v. Worker with HIV-AIDS, leprosy, mental illness: 4
vi. Small farmer: 2.5		vi. Worker with TB: 2
vii. Self-employed artisan and worker: 3		vii. Disabled dependent: 2
Panel C: Socio-Economic Caste Census (2011) Criteria		
First Stage (Exclusion)	Second Stage (Inclusion)	Third Stage (Scoring with equal weights)
i. Motorised two/three/four wheeler/ fishing boat	i. Households without shelter	i. Households with only one room, kucha walls and kucha roof
ii. Mechanised three/four wheeler agricultural equipment	ii. Destitute/living on alms	ii. No adult member between the ages of 16 and 59
iii. Kisan credit card with credit limit of Rs 50,000 and above	iii. Manual scavengers	iii. Female-headed households with no adult male member between 16 and 59
iv. Household with any member as a government employee	iv. Primitive tribal groups	iv. Households with a disabled member and no able-bodied adult member
v. Households with non-agricultural enterprises registered with the government	v. Legally released bonded labourers	v. Scheduled caste/scheduled tribe households
vi. Any member of the family earning more than Rs 10,000 per month		vi. Households with no literate adult above 25 years
vii. Paying income tax or professional tax		vii. Landless households deriving a major part of their income from manual casual labour
ix. Three or more rooms with all rooms having pucca walls and roof		
x. Own a refrigerator or a landline phone		
xi. Own 2.5 acres or more of irrigated land with at least one piece of irrigation equipment		
xii. Five acres or more of irrigated land for two or more crop seasons		
xiii. Owning at least 7.5 acres of land or more with at least one piece of irrigation equipment		

Source: Alkire and Seth (2012).

Appendix II: India's Rural Poverty Headcount: MPI with Varying Cut-offs and Tendulkar Estimations 2004-05 and 2009-10 (in %)

State	Official MPI Headcount (Rural) k = 33% (NFHS 2005-06)	MPI Headcount (Rural) if k = 25% (NFHS 2005-06)	MPI Headcount (Rural) k = 40% (NFHS 2005-06)	Tendulkar Rural Poverty Estimate (NSS 2004-05)	Tendulkar Poverty Estimate (NSS 2009-10)
Andhra Pradesh	54.7	65.5	30.7	32.3	22.8
Arunachal Pradesh	58.5	66.5	37.1	33.6	26.2
Assam	67.2	77.5	50.2	36.4	39.9
Bihar	84.9	90.5	72.0	55.7	55.3
Chhattisgarh	80.4	85.6	56.4	55.1	56.1
Goa	29.3	38.7	12.8	28.1	11.5
Gujarat	57.1	67.8	36.6	39.1	26.7
Haryana	47.8	59.8	26.4	24.8	18.6
Himachal Pradesh	32.6	44.8	12.8	25.0	9.1
Jammu and Kashmir	50.8	63.9	29.4	14.1	8.1
Jharkhand	87.8	94.9	76.0	51.6	41.6
Karnataka	57.2	68.6	34.0	37.5	26.1
Kerala	14.8	25.2	5.1	20.2	12.0
Madhya Pradesh	80.2	87.7	60.6	53.6	42.0
Maharashtra	57.8	68.6	35.6	47.9	29.5
Manipur	47.9	56.7	25.6	39.3	47.4
Meghalaya	67.5	75.9	50.8	14.0	15.3
Mizoram	34.2	46.7	19.3	23.0	31.1
Nagaland	59.6	68.8	40.1	10.0	19.3
Orissa	69.5	79.1	52.3	60.8	39.2
Punjab	29.5	41.8	15.2	22.1	14.6
Rajasthan	75.7	84.1	57.5	35.8	26.4
Sikkim	36.7	45.4	19.8	31.8	15.5
Tamil Nadu	40.5	54.3	17.3	37.5	21.2
Tripura	59.0	69.8	36.2	44.5	19.8
Uttar Pradesh	77.2	85.4	59.8	42.7	39.4
Uttarakhand	48.3	59.1	28.3	35.1	14.9
West Bengal	70.8	78.7	52.6	38.2	28.8
India	66.6	75.7	48.0	41.8	33.8