**Comparing Consumption and Multidimensional Measures of Poverty**

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Abstract:

Latest studies have started focusing on the multidimensional measures of measuring poverty as an alternate to the already existing income/consumption based method. Some studies also point out the discrepancy between the number of poor as calculated by the two measures in India. This paper attempts to compare the calculation of poor by both the consumption based method (old) and the multidimensional method (new) using the NSS dataset. If the method of defining the poor is valid, then the new method should identify atleast as many poor as the old method. However, there will be extra households that the new method will define as poor. We make an attempt to exclude these households by analysing their household characteristics that make them different from the ones that are poor by both the consumption and multidimensional methods. We conclude that the new measure does not provide us with extra information to make a case for adopting a new measure for counting the poor.

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1. **Introduction**

The poor are defined as those people whose consumption standards fall short of the norms, or whose income lies below a poverty line. Consumption-based poverty has been used for a long time to determine the number and proportion of poor population below a poverty line. The poverty line is a cut off that separates poor from non poor, given the size distribution of the population by per capita consumption classes[[3]](#footnote-4). This poverty line has changed over years and has been updated over time. However, because of certain limitations, the consumption based poverty measure has been criticised for not identifying poor correctly. The poverty line itself has been questioned on the basis of which the poor are identified. There is another criticism on the recall based consumption items, as well as consumption data being either underreported or over-reported. There are other issues as well. Consumption patterns change over time. The poor consume commodity bundles that are different from that consumed by the non poor. Also, one aggregated price index cannot be used as it is an average of all consumer prices, the weights are also average consumption weights that do not reflect the commodity composition as used by the poor[[4]](#footnote-5).

There are differences over the measure of poverty to be used, such as the headcount ratio or the poverty gap. The main criticism is the calorie norm on which the poverty line is based. It is assumed to be equal for everybody across a household, be it an adult or a child.

So far the poverty line has been anchored around a given calorie norm and the corresponding all India consumption basket for the year 1973-74. The poverty line as estimated for the base year is updated for changes in prices overtime. This involves defining the poverty line in terms of a certain consumption expenditure with which the households, on an average, consumed food that meet the calorie norm together with the non food items as they choose. The poverty line is updated over time to allow for changes in prices with reference to the consumption basket associated with the poverty line in the base year. This method is used in contrast to the method that allows for changes in the consumption basket provided the food norms meet the calorie norm. That is, while the calorie norms remain unchanged, the consumption basket associated with the calorie norm would change[[5]](#footnote-6). However, recent studies have used the updated price indices as per NSS consumption rounds to reflect changes in consumption patterns over time.

Researchers and policy makers have come up with an alternative measure of identifying poor, that of a multidimensional measure, influenced by the writings of Amartya Sen. The idea behind constructing these measures has been to look at direct ways of measuring poverty. This measure looks at the shortfall of a dimension from a cut off defined as poor. The multidimensional measure as defined by Alkire and Foster in their seminal paper “Counting and Multidimensional Poverty Measurement” identifies the poor using two forms of cut-offs. One, a dimension specific cut off, which identifies whether a person is deprived with respect to that dimension. The other is how widely deprived must a person be in order to be considered poor. Their adjusted FGT measures satisfy a range of useful properties such as decomposability, monotonicity, etc.

Hence, a unidimensional method of counting the number of poor looks at the income (consumption) method, where human deprivation is visualised through income as an intermediary of basic needs. A multidimensional measure in contrast looks at shortfalls from minimum levels of basic needs themselves. The multidimensional poverty index is then an aggregation of shortfalls of all individuals.

While estimations of poverty are done by the Planning Commission, a census to identify BPL households is also conducted by the Ministry of Rural Development. The BPL census for the Tenth Plan (2002-07) recommended the methodology of score based ranking of each household indicating their quality of life. Thirteen socio-economic parameters including size of land holding, type of house, availability of clothes, food security, sanitation, literacy, means of livelihood and indebtedness, are identified to get an idea about the level of living of the families. For each question, there are multiple choice answers that are scored. The maximum score is 52 for 13 questions taken together. The cut off for the BPL category is determined by the numbers as given by the Planning Commission’s estimates for the poor in the state concerned. The BPL survey is also multidimensional in a way as defined.

The problem with the multidimensional measure for counting the poor is this. One, it uses a cut off that is subjective in nature. Two, consider an individual who is say, in a vulnerable occupation, such as a construction worker. If there are two of them in a household who earn more than the consumption based poverty line, they will not be consumption-wise poor but the multidimensional measure will call them poor based on their occupation. Also, if a woman who is poor according to the BPL census, but her score increases at the margin, should she stop getting the benefits of the welfare schemes? If one takes the dataset of all rural and urban households, almost the entire population will turn out to be vulnerable in one dimension or the other (as we found out in our study detailed in Section II). If one uses a strict cut off, of say, all those households who are vulnerable in 5 dimensions as being worse off than those in 3 or 4 dimensions, how does one rate the dimensions in their order of importance?

One of the drawbacks quoted in the literature of the income approach is that some attributes (non monetary) cannot be purchased as markets do not exist. There are some public goods such as health and education that cannot be purchased by the poor. The income approach assumes that a market exists for all attributes and prices reflect the utility weights all households assign to these attributes.

This paper argues that the consumption based method of counting the poor captures consumption of households for an exhaustive list of both food and non food items. If properly estimated, it should reflect a household’s food and non food needs, and whether a household is poor or not given the poverty line. In a sense, this should be able to reflect the deprivation status of a household.

The paper is organised as follows. Section II compares the consumption and multidimensional measure of poverty using NSS 61st Employment and Unemployment Round for urban India. We calculate the proportion of multidimensional poor out of the consumption based poor, as well as the extra population that is only multidimensionally poor but not consumption wise poor. We call the consumption wise poor as monthly per capita consumption (mpce) poor from now on. We then study the characteristics of the extra population that is multidimensional poor and make a case for excluding them from the poor population that is defined by the poverty line. This also informs us in a way how far off the conventional poverty mark we are. In Section III, we do the same exercise but with rural population. Section IV summarises the results.

1. **Comparison of Consumption and Multidimensional Measures of Poverty (Urban India)**

**II.A Defining Vulnerable Households**

To find if any two measures (old and new) are comparable, we need to know if we lose any information from the new measure as compared to the old one. In other words, if the new measure (that defines multidimensional poor) is able to capture if not all, most of the poor based on the old measure (those defined as mpce poor), then we can say that the new measure captures most of the poor correctly. As mentioned in the Introduction, multidimensionality will also capture a lot of extra poor who are not mpce poor. If we can show that these extra households are not being captured as the mpce poor due to certain characteristics (household or individual) that make them different from those that are both mpce and multidimensional poor, then we can say that they are not poor, and it is alright to leave these households out of the safety net programmes. If we do find some households from this list of extra poor that are poor due to certain characteristics but are not being captured by the mpce based definition of poor, then we need to calculate how many extra households are getting captured by the new definition that were hitherto not included. This will have cost implications for policy makers of rolling out welfare schemes to the additional people.

We take the NSS 61st employment and unemployment round[[6]](#footnote-7) dataset to calculate if the poor that are been covered by the consumption based measure are also covered by the multidimensional poverty measure. (This round provides us with details of every member’s principal usual activity status, which the consumption round does not provide. This is important since occupation vulnerability is one of the important dimensions for our multidimensional measure, and this information is not available in the consumption round.)

To define multidimensional poor, we use the following variables in the NSS dataset. We first study the urban population. The household is given a 0 or 1 depending on whether the household is below or above the cut off defined. The scores across all dimensions are then added for each household to determine its vulnerability.

1. **Principal occupation**-Principal occupation of a household is an occupation from where 50 percent or more of its earnings come from. For our multidimensional definition, we have used the following occupations -cultivator household, construction worker, agricultural labour, canvasser, delivery man, newspaper boy, ambulance driver, auto rickshaw driver, stone fixer, and mason. Some of these occupations are hazardous such as stone mason, construction worker, etc. and these are also the occupations where bottom 20 percent of the population lies (based on mpce).
2. **Education**-We define an educationally vulnerable household as one where all members of a household who are in the working age group (18-60 years) are educated till middle school and below. Education, or the lack of it, makes one vulnerable, in case the head of the household who is in the working age group loses his/her job.
3. **Widow headed households**-A household where a widow in the working age group is the head of the household is taken as vulnerable.
4. **Vocational education** –Vocational education provides skills to a member, and is an investment for the future. Those households where all members in the age group of 15-29 years have no vocational education are defined as vulnerable.
5. **Numbers of dependents** - Dependents in the household greater than the All-India urban average are considered vulnerable households. Dependents are defined as the non working age group – adults greater than 60 years of age and children less than 18 years of age.

Tables 1 and 2 provide the distribution of multidimensional counts and incidence of dimensions that make a household vulnerable.

**Table 1: Distribution of Multidimensional Counts**

|  |  |  |  |
| --- | --- | --- | --- |
| Multidimensional cut off | Proportion of all Households (HHs) | Proportion of Poor HHs (mpce and multidimensional) | Proportion of Extra poor HHs (mpce non poor but multidimensional poor) |
| 1 | 38.16 | 15.90 | 44.60 |
| 2 | 36.33 | 36.91 | 36.16 |
| 3 | 19.51 | 34.12 | 15.28 |
| 4 | 5.68 | 12.32 | 3.76 |
| 5 | 0.29 | 0.72 | 0.17 |

**Table 2: Incidence of Dimensions that make a Household Vulnerable**

|  |  |  |  |
| --- | --- | --- | --- |
| Vulnerable in following dimensions | Proportion of all Households | Proportion of Poor HHs (mpce and multidimensional) | Proportion of Extra poor HHs (mpce non poor but multidimensional poor) |
| Occupation | 16.95 | 28.91 | 16.10 |
| Education | 43.20 | 71.66 | 41.62 |
| Vocational Education | 55.34 | 63.17 | 61.59 |
| Widow-headed | 10.27 | 12.26 | 11.28 |
| Number of Dependents | 47.18 | 60.04 | 48.12 |

Note that the proportion of poor households (both by mpce and multidimensional definition) in Tables 1 and 2 are worse off in their characteristics of vulnerability than the proportion of extra households. For example, in Table 2, theproportion of households that are occupationally vulnerable are about 29 percent for the poor households using both measures, and about 16 percent for the extra households.

The next task for us is to take this new definition of multidimensionality and calculate how many people who are mpce poor are also multidimensional poor. Tables 3 and 4 provide the absolute number of poor and non-poor by both definitions as well as their proportions in the total households respectively. Table 5 provides the percentage of overlapping households by both mpce based definition and multidimensional definition.

**Table 3**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Number of MPCE and Multidimensional poor households* | | Multidimensional Poor (greater than or equal to one dimension) | | |
| **Poor** | **Non-Poor** | Total |
| MPCE Poor | **Poor** | 10556937.2 | 254390.94 | 10811328.17 |
| **Non-Poor** | 36484182.2 | 5363905.2 | 41848087.33 |
| Total | 47041119.4 | 5618296.1 | 52659415.5 |

**Table 4**

|  |  |  |  |
| --- | --- | --- | --- |
| *MPCE and Multidimensional Poor as Percentage of Total Population* | Multidimensional Poor(greater than or equal to one dimension) | | |
|  | | **Poor** | **Non-Poor** |
| MPCE Poor | **Poor** | 20.05 | 0.48 |
| **Non-Poor** | 69.28 | 10.19 |

**Table 5**

|  |  |  |  |
| --- | --- | --- | --- |
| *Multidimensional Poor/non-Poor as Percentage of the MPCE Poor/non-Poor* | | Multidimensional Poor(greater than or equal to one dimension) | |
|  | | **Poor** | **Non-Poor** |
| MPCE Poor | **Poor** | 97.65 | 2.35 |
| **Non-Poor** | 87.18 | 12.82 |

Note that Tables 4 and 5 are derived from Table 3. While Table 4 provides results as a percentage of total households, Table 5 provides percentages of those that are multidimensionally poor and non poor out of mpce poor as well as multidimensionally poor and non poor out of mpce non poor population. Table 5 shows that 97.65 percent of the mpce poor are identified as multidimensional poor, while the remaining 2.35 percent of the mpce poor are not identified as poor using the multidimensional definition.

Note that since the multidimensional method of estimating the number of poor is used as a proxy for the consumption-based method, the former method has to be analysed independent of the poverty line used for the mpce-based poor. We define a new benchmark and take each household’s distance from the maximum mpce of the population. Note that this is at the All India level (rural or urban as the case maybe). We define the distance on a scale of 0 to 1, 0 being closest to maximum mpce and 1 being farthest from the maximum mpce. A score close to 0 would imply a better off household as compared to one that is close to 1.

At this point it is also important to note that NSS divides data according to three second stage strata (SSS) for both rural and urban sectors. For the urban sector, three second stage strata are defined as follows. SSS 1 are those households with MPCE greater than a cut off A; SSS 2 are those with MPCE equal to or less than the cut off A but equal to or more than a cut off B (i.e. B ≤ MPCE ≤ A); SSS 3 are those with MPCE less than the cut off B. The two cut offs A and B based on MPCE of NSS 55th round are determined at NSS region level in such a way that the top 10 percent households have MPCE less than A and bottom 30 percent have MPCE less than B.

We first examine the characteristics of those mpce poor households that our multidimensional measure is not able to identify, that is, 0.48 percent of the population. They are not vulnerable in any of the dimensions that we have defined but are still below the mpce based poverty line, that is, we are not able to capture them due to some reason.

* If one looks at the distance of these households from the maximum mpce (Figure 1), the range for the population is between 0.78 to 0.97 units, that is, the population is as high as 0.97 units far away from the maximum mpce. Hence, the 0.48 percent of households, if looked at from the maximum mpce distance are relatively worse off than those that are not in this band.

**Figure 1: Distance from Maximum MPCE (0.48 percent of households)**



* A closer look at the data reveals that about 27.21 percent of these households are salary and wage earners (household head in the working age group as salary wage earners). The principal occupations for this population are those of clerks, peons, primary school teacher/headmaster, attendants, boardman comber (textile), handloom weaver, power loom weaver, tailor, coatmaker, pipe fitter, plumber, cycle mechanic, etc. This implies that even though this segment of the population is one where the household head is a salary-wage earner, they seem to be vulnerable in terms of their principal occupations.
* On an average, the household size of mpce poor but multi-dimensionally non poor is higher (5.84) as compared to that of households that are both mpce and multidimensional poor (5.67). This could indicate that even though the population is not multidimensional poor, the same income is required to feed a larger set of members in a household. Also note that about 43 percent of these households are second stage stratum 3, that is, bottom 30 percent of the households.
* We next look at how these numbers are sensitive to a change in the definition of multidimensionality. So far educational vulnerability for a household has been defined as a one where all members in the working age group are educated middle and below. If we now relax the assumption to include those households where more than 50 percent of the members in the working age group are educated middle or below, the over-lapping households (both mpce and multidimensional poor) increase to 20.37 percent and extra households (mpce poor but multidimensional non-poor) reduce to 0.16 percent. However, note that with an increase in the percentage of overlapping households, even the percentage of non overlapping households or the extra households increases.

Overall, we can say that the unidentified 0.48 percent of the poor population according to our multidimensional definition can also be included for safety net programmes if we look at additional characteristics of these households, and look at their distance from the maximum mpce. They are the ones who can be included provided we relax the definitions of multidimensionality a little bit. However, note that these are also the households that are furthest away from the maximum mpce in the entire population of mpce poor. They happen to be not vulnerable according to the strict definition of multidimensionality that we have proposed. However, taking into account their other characteristics they clearly seem to be worse off than their counterparts who were found to be overlapping with the mpce poor population. Note that we are again to some extent relying on mpce as a tool/variable to consider their well being (or the lack of it). Consumption, in a sense, does reflect a household’s or individual’s state of being in poverty or not.

**II.B Characteristics of Population that is MPCE non-poor but Multidimensional Poor**

We next look at characteristics of those households that are multidimensional poor but mpce non poor. There is an extra set of population that our definition defines as poor based on any dimension greater than or equal to one. Of the total population, 69.28 percent are those that are mpce non poor but multidimensionally poor. It is the characteristics of these extra households that will tell us how far away from the mpce poor mark we are. In other words, how many of the poor are we overestimating using the new definition of poverty.

We consider occupation and education to be the two most important indicators of poverty, out of the five multidimensional indicators for the urban population that we have chosen; and these are also the dimensions that help one get out of the intergenerational cycle of poverty. We have defined certain occupations as vulnerable since these are the ones where health and safety concerns are the most. The idea is to explore if there are certain characteristics of these households that make a case for them not to be included as poor. Note that we have used a very liberal cut off for defining multidimensional poor- as those who are vulnerable in any dimension (greater than equal to one).

We now consider characteristics of those households that are mpce non-poor but multidimensionally poor. Recall that we are trying to make a case for as many of these households to be excluded from the list of poor households. These extra households may be vulnerable in one or more of the dimensions as defined by the new measure, but they have the following characteristics.

1. Salary wage earners, especially if those are heads of the household, can be assumed to be better off than those where the heads of the household are not salary/wage earners, as this amounts to a regular flow of income to the household. Of the 69.28 percent households that are extra poor according to the new definition, about 36.81 percent are salary/wage earners, that is, 25.50 percent of the total households.
2. This leaves us with 43.78 percent of the households. We subtract 9.26 percent of the second stage stratum 1 households defined as affluent households by NSS of the extra poor, or about 6.4 percent of the households.
3. This leaves us with 37.37 percent households. 41.25 percent of the extra poor is not occupationally vulnerable (according to our new definition). This constitutes 28.58 percent of the households. This leaves us with 8.79 percent of total households.
4. Of the extra poor, about 4.30 percent is not educationally vulnerable, that is, they have scope for getting better in terms of their standard of living. This constitutes 2.98 percent of the total households.
5. This leaves us with 5.81 percent of households that are educationally and occupationally vulnerable, that does not belong to second stage stratum 1, and are not salary wage earners.

Note that about 3.18 percent of the extra households (or 1.74 percent of the total households) is of household type 3, that is, regular salary wage earner, that is, in such cases, a member of the household who is not the household head is a regular salary wage earner. We take this as less vulnerable than a household where there is no member who is a regular salary/wage earner. This leaves us with 3.18 percent of the households.

Of the extra poor, about 2.5 percent have vocational education (for the age group 15-29 years). This leaves us 1.87 percent of the total population.

In all, we can say that the data describes about 1.87 percent of the households as extra poor, which our definition of poverty defines as poor but they are not multi-dimensionally poor. This means an addition of 9 lakh (0.9 million) households to the already existing 10.8 million households. Note that 50 percent of these remaining households are more than 0.7 units away from the maximum mpce (Figure 2).

**Figure 2**



Table 6: Break up of the Extra Poor Households in Urban India

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Break up of Extra poor | | | | | | | | | | | |
| Total no of households (taking out top 5 percent of the households)-A | Extra poor -B | Total no. of salary & wage earners-C | Net-D (B-C) | Second stage stratum 1(affluent hhs) out of D-E | Net (D-E)-F | Not occupationally vulnerable out of F-G | Net (F-G)-H | Not educationally vulnerable out of H-I | Net (H-G)-J | Household type 3 out of J-K | Net (J-K)-L | Not vocationally vulnerable out of L-M | Net (L-M)-N |
| 52659415.5 | 36484182.2 | 13428694.1 | 23055488 | 3377775.2 | 19677712.8 | 15049664.2 | 4628048.64 | 1570488.2 | 3057560.4 | 1159474.4 | 1898085.97 | 914365.93 | 983720.04 |
| As percentage of total urban population | | | | | | | | | | |  |  |  |
|  | 69.28 | 25.50 | 43.78 | 6.41 | 37.37 | 28.58 | 8.79 | 2.98 | 5.81 | 2.20 | 3.60 | 1.74 | 1.87 |

**II.C Logistic Regression**

To find out the correspondence between each indicator and probability of being poor, we conducted a logistic regression to find the log odds of being poor. The dependent variable is a binary variable with 0 for being non poor and 1 being poor. If the value of the odds ratio is greater than 1, it indicates that as the predictor increases, the odds of the occurrence of the outcome increase, and less than one implies that as the predictor increases, the odds of the occurrence of the outcome decrease.

The results of the logistic regression are given in Table 7 below.

**Table 7**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Odds Ratio | Std. Err. | z | P>z | [95% Conf. Interval] | |
| Occupationally vulnerable | 1.74 | 0.02 | 43.09 | 0 | 1.70 | 1.78 |
| Educationally vulnerable | 3.93 | 0.04 | 128.95 | 0 | 3.85 | 4.01 |
| Vocationally vulnerable | 1.44 | 0.02 | 34.1 | 0 | 1.41 | 1.47 |
| Number of dependents | 2.05 | 0.02 | 65.74 | 0 | 2.01 | 2.10 |
| Widow headed households | 1.37 | 0.02 | 19.15 | 0 | 1.32 | 1.41 |

We see that all parameters are statistically significant with the correct signs. The above regression analysis reveals that there is a positive relationship between households with occupation vulnerability and being poor. For instance, the probability of a household being poor with occupation vulnerability is 1.74 times higher than those with no occupation vulnerability. Similarly, probability of a household being poor that is educationally vulnerable is 3.93 times more than that which is not educationally vulnerable. A widow headed household has a higher probability (1.37 times) than one that is not widow headed, and so on.

1. **Comparison of Consumption and Multidimensional Measures of Poverty (Rural India)**

**III.A Defining Vulnerable Households**

We do the exercise that we did for the urban sector for the rural sector as well. However, there is a difference in the variables chosen as indicators of poverty used in the multidimensional definition given the inherent differences between rural and urban sectors. For example, ownership of land is an important variable in explaining poverty in rural India as compared to urban India as majority of the population work in agriculture in rural India. These indicators are as follows.

1. **Principal Occupation** -We used the following occupation categories-cultivator, agricultural labourer, ploughman, construction bricklayer, brick mason, cycle rickshaw puller, etc. These are also the occupations where bottom 20 percent of the population in terms of mpce lies.
2. **Education**- This defines a household as vulnerable where all members in the working age group are educated primary and below.
3. **Land possessed**-Since land holdings are an important indicator of standard of living in rural areas, those cultivator and agricultural households whose land possessed is less than 1 hectare were considered as vulnerable.
4. **Number of Dependents** – Similar to urban India, if the number of dependents in the household is greater than the average for the All India rural population, we define the household as vulnerable.
5. **Widow headed households**-All households where the head of the household is a widow and in the working age group are defined as vulnerable households.

Tables 8 and 9 provide the distribution of dimension counts and incidence of dimensions that make a household vulnerable.

**Table 8: Distribution of Dimension Counts**

|  |  |  |  |
| --- | --- | --- | --- |
| Multidimensional cut off | Proportion of all Households | Proportion of Poor Households (mpce and multidimensional) | Proportion of Extra Poor (mpce non poor but multidimensional poor) Households |
| 1 | 18.89 | 8.91 | 21.77 |
| 2 | 34.25 | 26.83 | 36.39 |
| 3 | 33.89 | 39.93 | 32.15 |
| 4 | 12.33 | 23.07 | 9.24 |
| 5 | 0.61 | 1.24 | 0.43 |

Table 9: Incidence of Dimensions that make a Household Vulnerable

|  |  |  |  |
| --- | --- | --- | --- |
| Vulnerable in following dimensions | Proportion of all Households | Proportion of Poor (mpce and multidimensional) | Extra poor (mpce non poor but multidimensional poor) |
| Occupation | 66.43 | 70.47 | 66.44 |
| Education | 55.56 | 70.56 | 52.23 |
| Land possessed | 75.84 | 82.63 | 75.22 |
| Widow-headed | 4.73 | 4.08 | 5.00 |
| Number of dependents | 35.66 | 53.16 | 31.25 |

Tables 10, 11 and 12 below present the results of the overlapping households as well as the extra households for rural India.

**Table 10**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Number of MPCE and Multidimensional poor* | | Multidimensional Poor (any dimension) | | total |
|  |  | **Poor** | **Non-Poor** |  |
| MPCE Poor | **Poor** | 30016883 | 160032.8 | 30176915.83 |
| **Non-Poor** | 104212430 | 1681046.1 | 105893475.9 |
|  |  | 134229313 | 1841078.9 | 136070391.7 |

**Table 11**

|  |  |  |  |
| --- | --- | --- | --- |
| *MPCE and Multidimensional Poor as Percentage of Total Population* | Multidimensional Poor (greater than or equal to one dimension) | | |
|  | | **Poor** | **Non-Poor** |
| MPCE Poor | **Poor** | 22.06 | 0.12 |
| **Non-Poor** | 76.59 | 1.24 |

**Table 12**

|  |  |  |  |
| --- | --- | --- | --- |
| *Multidimensional Poor/non-Poor as Percentage of the MPCE Poor/non-Poor* | | Multidimensional Poor(greater than or equal to one dimension) | |
|  | | **Poor** | **Non-Poor** |
| MPCE Poor | **Poor** | 99.47 | 0.53 |
| **Non-Poor** | 98.41 | 1.59 |

Table 12 shows that the new measure of poverty can capture 99.47 percent of the mpce poor while there are almost an equal percentage (98.41) percent of households that are defined as extra poor by the new definition. It is not surprising that the extra poor are similar in number to the overlapping households as a member will be vulnerable in some dimension or the other given our definition for rural India. We can look at different cut offs to see which households can be prioritised over others, or in other words, we can say that a household vulnerable in 3 dimensions should be given priority over a household that is vulnerable in, say, 1 or 2 dimensions.

Let us look at the characteristics of this extra poor population for rural India.

Again, we exclude the bottom 5 percent of the population for outliers, and get the following distribution of mpce for the remaining population (Figure 3).

**Figure 3**



We then take the distance from the maximum mpce (INR 997 in rural areas) of all households. We find the distance of mpce from the maximum mpce for overlapping as well as the extra households on a scale of 0 to 1.

For the overlapping households, the distance from maximum mpce ranges from 0.64 to 0.98 units, while for the extra households it ranges from 0 to 64 units. This indicates that on an average the distance of the overlapping households from the maximum mpce is higher than those that are only multidimensionally poor. This is an indication of the extra households being better off than the overlapping households as far as their mpce is concerned.

Let us look at other characteristics of these extra poor households.

1. Of the total rural households, 76.59 percent are extra poor. About 4 percent belong to second stage stratum[[7]](#footnote-8) 1, that is, affluent of the total households or 5.4 percent of the extra poor. This leaves us with 72.45 percent households.
2. 24.35 percent of the total households are not vulnerable in their occupations as defined by the multidimensional definition. This leaves us with 48.10 percent of the households.
3. 20.99 percent of the total households, or 27.41 percent of the extra poor is not educationally vulnerable. This leaves us with 27.11 percent.
4. About 7 percent of the total households have land greater than 1 hectare and are hence not land-wise vulnerable as per our multidimensional definition. This leaves us with 20.28 percent of the total households.
5. About 14.36 percent of the households are not vulnerable based on the number of dependents in the household. This leaves us with about 6 percent of the total rural households.
6. 2.3 percent of these households are those where all eligible children in the household are in educational institutions, and the household is investing in the next generation to make their lives better. This leaves us with 3 percent households.
7. Out of the remaining households, those that are less than 0.50 or more units away from the maximum mpce are about 1.11. We are left with 2.49 percent extra households.

The above results can be summarised in Table 13 below.

**Table 13**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | Break up of extra poor | | | | | | | | | | | | | |
| Total no. of households (taking out top 5 percent of the population)-A | Extra Poor-B | Second stage stratum 1(affluent hhs)-C | Net (B-C)-D | Occupationally not vulnerable out of D-E | Net (D-E)-F | Educationally not vulnerable out of F-G | Net (E-F)-H | Land wise not vulnerable out of H-I | Net (H-I)-J | Not vulnerable in terms of their dependents out of J-K | Net (J-K)-L | All children studying in educational institutions out of L -M | Net (L-M)-N | Distance from max mpce is less than 50 percent out of N-O | Net (N-O)-P |
| 136070392 | 104212430 | 5632407 | 98580023 | 33126843 | 65453179 | 28562224 | 36890955 | 9295461 | 27595494 | 19544637 | 8050857 | 3158891 | 4891966 | 1509792 | 3382173 |
| As percentage of total households | | | | | | | | | | | | | | |  |
|  | 76.59 | 4.14 | 72.45 | 24.35 | 48.10 | 20.99 | 27.11 | 6.83 | 20.28 | 14.36 | 5.92 | 2.32 | 3.60 | 1.11 | 2.49 |

Hence, we are left with 2.49 percent of extra households (3.3 million) in rural India in addition to the already identified mpce based rural poor of 30 million households.

**III.C Logistic Regression**

The results of the logistic regression are as follows.

**Table 11**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Odds Ratio | Std. Err. | z | P>z | [95% Conf. interval | |
|  |  |  |  |  |  |  |
| Occupation vulnerability | 1.27 | .01 | 26.45 | 0 | 1.25 | 1.30 |
| Education vulnerability | 2.49 | .02 | 100.22 | 0 | 2.45 | 2.54 |
| Land possessed less than 1 hectare | 1.64 | .01 | 47.28 | 0 | 1.61 | 1.68 |
| No of dependents | 1.87 | .01 | 70.57 | 0 | 1.83 | 1.90 |
| Widow headed households | 0.88 | .02 | -4.86 | 0 | 0.84 | 0.93 |

The results show that all the variables are significant. Again, the dependent variable is a binary variable with 0 for being non poor and 1 being poor. If the value of the odds ratio is greater than 1, it indicates that as the predictor increases, the odds of the occurrence of the outcome increase, and less than one implies that as the predictor increases, the odds of the occurrence of the outcome decrease.

For widow headed households, the odds ratio is less than 1. Hence, we cannot say anything about the results for this variable. If we remove the variable of widow headed households from our definition of multidimensionality, we find that we can still explain 99 percent of the mpce poor using the new definition. 96.6 percent are the extra poor that the new definition identifies.

**Conclusion**

The above results show that by using the new definition of poverty in the multidimensional sense, we add about 2 percent vulnerable households in urban India and 3 percent vulnerable households in rural India. The analysis can be extended at the state level to see the disparity amongst states in India using both measures. However, one can also see that the extra poor households are those that are less further away from the maximum mpce than their poor counterparts, if we take distance from the maximum mpce as a criterion to gauge poverty of a household. However, some of these extra poor, both in rural and urban India are at the margin of the poverty line, and any increase in the poverty line will bring them into the fold of the safety net programmes. Consumption based poverty lines have been scientifically calculated with a clear methodology in place using calorific norms. The Task Force appointed in 1979 constituted by the Planning Commission accepted the calorie intake norm according to fourteen age-sex-activity categories. The census based activity pattern, according to age and sex, was super imposed on the projected rural and urban populations. The specific calorie norms were then weighted by the corresponding composition of the rural and urban populations separately, to derive rural and urban average uniform calorie norms. The average per capita quantities of food items consumed within each per capita total expenditure (PCTE) class intervals were converted into calories using appropriate conversion factors. A relationship was thus obtained between average daily calorie consumption per capita and the associated average PCTE was obtained for rural and urban populations[[8]](#footnote-9). These details only show that the consumption based methodology is based on certain defined norms. The norms can be updated over time to reflect changes in lifestyle patterns of individuals.

The above analysis could have been done at a more detailed level by studying their principal occupations or usual principal activity status minutely. However, the analysis in this paper is an indication of the direction in which the results move, especially for the extra poor households that are multidimensionally poor. Also note that the there is a difference between counting the poor and identifying them for various schemes. Our exercise is an attempt in calculating the total number of poor. A multidimensional measure can include income as one of the dimensions alongwith other dimensions such as health and education. The issue is if we use consumption as a measure, then one has to ensure that there is no double counting in these dimensions. For instance, health and education expenditures are already included in the mpce definition in the NSS dataset. Also, once an area is defined as vulnerable/poor, it is then that one can construct a measure that calculates how many are vulnerable in health, education, etc. to provide them with specific benefits. It helps while distributing funds to get an estimate of how much the state will have to spend on health, education, sanitation, etc. The multidimensional measure still has an element of subjectivity in it that provides scope for ambiguity. The measure at best can be taken supplementary to the consumption based method of identifying the poor.

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1. Namrata Ghosh is a Research Fellow at India Development Foundation [↑](#footnote-ref-2)
2. Bhupesh Yadav is a Research Fellow at India Development Foundation [↑](#footnote-ref-3)
3. Report of the Expert Group on Estimation of Proportion and Number of Poor, Planning Commission, July 1993 [↑](#footnote-ref-4)
4. Dubey and Gangopadhayay, 1998 [↑](#footnote-ref-5)
5. Report of the Expert Group on Estimation of Proportion and Number of Poor, Planning Commission, July 1993 [↑](#footnote-ref-6)
6. Rural poverty rate according to NSS 61st Employment and Unemployment round is 24.14 and urban poverty rate is 24.8 percent according to the poverty lines as defined by Planning Commission for 2004-05. [↑](#footnote-ref-7)
7. For rural India, SSS1 consists of relatively affluent households, SS2 consists of the rest-households having principal earning from non agricultural activity, and SS3 consisting of other households. [↑](#footnote-ref-8)
8. Details of the methodology are given in “Counting the Poor”, by Dubey and Gangopadhyay. [↑](#footnote-ref-9)