Measuring Basic Needs Deprivation Using Multi-Dimensional Poverty Index (MPI): A Case Study of Malaysia's Kesedar

Naziruddin Abdullah, PhD
{naziruddin@unikl.edu.my}

Universiti Kuala Lumpur Business School

Abstract. To construct a Multi-dimensional Poverty Index (MPI) for the purpose of measuring the basic needs deprivation of population living in a Regional Development Area (KESEDAR), which comprises of four districts, namely Gua Musang, Jeli, Kuala Krai and Tanah Merah. The four districts are located in the state of Kelantan, Malaysia. The result is in turn compared with the level of basic needs deprivation at the national level. This study employs multistage sampling method to examine data of 2133 respondents whom are all the heads of household. The questionnaires are designed and the index is constructed based on the methods advocated by UNDP and OPHI (2011). The result is based on the analysis of three (3) MPI dimensions, namely education, health and living standard, which involves a total of 10 indicators. The overall result shows that the population in KESEDAR are slightly more deprived than that of the National level, although both are still within tolerable category. Nonetheless, all districts exhibit high intensity of deprivation as it exceeded the cut-off value of 0.333, albeit being slightly lesser than the National level. As the study's data are drawn from a survey conducted in KESEDAR, the result may reflect the degree of basic needs deprivation that is pertinent to the regional area per se. As such, a generalization of the result to other regional development areas in Malaysia must be done with care. The findings suggest that income and basic needs should be fulfilled within minimum acceptable range in order to bring a person out of deprivation so as to mitigate poverty.

Keywords: Poverty Alleviation; MPI; KESEDAR; Cut-off Value; Basic Needs Deprivation

1 Introduction

Authors like Mahbub ul Haq (1995), Townsend (1993), Sen (1993) and Abdullah et al (2015) among others, have argued in favor of the need to define poverty as a multidimensional or multifaceted concept rather than relying on income or consumption expenditures per capita. In fact, measuring the acuteness of poverty using indexes such as Human Development Index (HDI), Quality Life Index and Well-being Index have been quite common in the past. Recently, a new milestone or breakthrough in the measurement of poverty has taken place

with the formulation and application of an index known as Multidimensional Poverty Index, or MPI for brevity. Among many advantages that the MPI had, it's simplicity and handy are the most striking ones. In general, MPI proposes a better way to account for the multidimensionality of poverty by specifying a poverty threshold or cut-off for each dimension of poverty before considering whether or not a household is poor. Specifically, it is built-up on three (3) dimensions with ten (10) indicators. While each of the first and second dimensions, namely Education and Health, has two indicators, the third dimension, Living Standards, has six indicators. Each indicator that belongs to the respective dimension is shown in Figure 1.
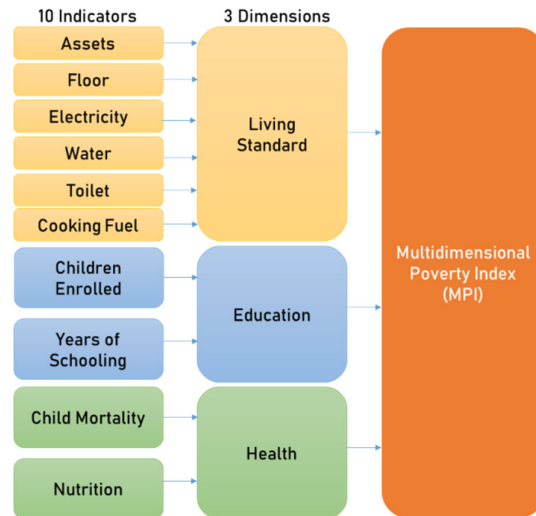

Fig. 1. Dimensions and Indicators of MPI

2   Literature Review

Unlike others, the literature review of this study will just be confined to answering few frequently asked questions that are related to the article's title. The *first* frequently asked question is: how to identify the poor? Perhaps, the answer lies in the way Lipton (1983) looked at it. He, for example, perceives it beyond mere numbers and statistics. According to him, there are several ways to identify the poor, and they are listed below as follows:

a) By their social and economic class - people who lack physical assets, or have assets of only low value, such as landless workers;
b) By residence - the rural poor, the urban poor;
c) By their lack of human capital - people with low educational attainments, stuck in low-paying jobs without access to retraining;
d) By the region in which they live - frequently the South, or the mountains, or areas distant from the capital city;
e) By the stage they have reached in the age cycle - old people or young families with children;
f) By the fact that they suffer from barriers to entry into jobs or capital markets discrimination on grounds of race or sex;

g) By family size - households with many children and other dependents, single-parent, female-headed families and widows;

h) By the season of the year - poverty rising in the rainy season; and finally,

i) By the fact that they are temporarily or chronically handicapped.

The *second* frequently asked question is: what is the best method to measure poverty? Since poverty, as mentioned above, is a sophisticated and multi-facetted phenomenon, two methods to measure it have been suggested by Sen (2001). They are:

a) An identification method, which essentially about identifying a group of people as poor; and,

b) An aggregation method, which boils down to aggregating the characteristics of the set of poor people into an over-all image of poverty.

While the identification exercise presupposes a viable concept of poverty that allows the specification of a poverty line in terms of income (or alternatively individual welfare/individual utility), which subsequently enable us to separate the poor from the non-poor, the aggregation activity requires an indicator of poverty as a measurement device, i.e., a poverty index which is usually conceived as being an increasing function of poverty. The *third* frequently asked question is: is it common to think of poverty in terms of material deprivation or lack of income? Here, it is interesting to note that Sen (2001) has distanced himself from this way of thinking. Instead, he shifted towards thinking of poverty in terms of a failure to meet certain basic needs, or a failure to possess certain basic capabilities. In other works, Sen has asserted that poverty is a "basic capability failure", which points to the fact that poverty is absolute in the space of capabilities but relative in the space of commodities. The *fourth* frequently asked question is: what should be the primary focus in poverty measurement? Must it be on human well-being or the quality of life? According to Townsend (1993), poverty can be thought of in terms of a shortfall of well-being. He opines that "people can be said to be deprived if they fall below standards of living which are attained by a majority of the national population or which are socially accepted or institutionalized". In short, if people are denied the resources required to rise above such standards, they are poor. However, Allegretto (2005 - https://www.epi.org/publication/bp165/) has extended Townsend's focus on poverty measurement by saying that poverty can be thought of in terms of: (1) a lack of basic necessities, these being particular commodities; (2) a failure to satisfy basic needs, where these are not specified in terms of commodities; or (3) a failure to possess basic capabilities.

The *fifth* frequently asked question is: how is one to specify "basic"? Qizilbash (1998) argues that basic is simply a prudential value if its realization is a necessary condition for the pursuit of any good human life. It could come in the form of some level of nourishment, of shelter etc. and must count as necessary for the formulation and pursuit of any conception of the good. That minimal level of "basic" value must be sensitive to cultural, social and historical context. The *sixth* frequently asked question is: how is one to specify "needs"? Needs, as defined by Streeten (1994) are minimum quantities of such things as food, clothing, shelter, water and sanitation, access to basic education and health services and security to prevent ill health, undernourishment, or under- and unemployment. To elaborate, needs in the context of health and nutrition are the sorts of things for which one needs food and medicine. Note that they are not themselves commodities. Rather, certain commodities (like food and medicine) have the characteristic that they nourish us or make us healthy. Each commodity derives its value from some characteristic which promotes a human interest. "Sanitation" and "shelter" come closest to being commodities. In this regard, houses have the characteristic that they protect us and provide shelter, and this makes our lives go better. Meanwhile, a good sewerage system has the characteristic that provides sanitary conditions.

Having said this, poverty is best thought of as a deprivation in terms of the values, realization of which is necessary for the pursuit of well-being. In this sense, poverty is about being short of the means for pursuing a decent well-being. It is worth mentioning here that the MPI, a jointly pioneering work of the United Nations Development Program (UNDP) and the Oxford Poverty and Human Development Initiative (OPHI) at the University of Oxford meets all the criteria required to measure basic needs deprivation, as elaborated above. In fact, in 2019 MPI has been applied to measure basic needs deprivation for 101 countries, covering 76 percent of the global population. The *seventh* and the last question worth asking is: Why KESEDAR is chosen as the case study? Hitherto, a study that measures the basic needs deprivation of Malaysia's KESEDAR is still scanty; not to mention the one using MPI. As such, this study is unique and hence could be regarded as a novel contribution to the discipline of poverty study. Indeed, it is for this reason that the MPI is applied to measure basic needs deprivation of Malaysia's KESEDAR. Briefly, KESEDAR (South Kelantan Regional Development Authority) is part of a land mass belonged to the state of Kelantan; one of 14 states that Malaysia is made up of. KESEDAR takes about 83% of the size of Kelantan and it is an agency for regional development under the Ministry of Rural Development of Malaysia. It was formed on 1 May 1978 under the Act 203, Development Board Act of Southern Kelantan 1978. KESEDAR covers the whole of Southern Kelantan which comprises the districts of Gua Musang, Kuala Krai, Tanah Merah and Jeli.

3   Methodology

In this study a multistage sampling is used. It involves the taking of samples in stages starting from bigger to smaller sampling units at each stage. Although multistage sampling seems to be a complex form of cluster sampling, it is relatively easy to manage as it involves dividing the population into groups (or clusters). It is from the clusters that the respondents are randomly chosen. Specifically, in the context of this study, we started with the biggest sample size (in terms of households/respondents), which is KESEDAR, followed by the four (4) districts that KESEDAR is made-up of, namely Gua Musang, Jeli, Kuala Krai and Tanah Merah, before the smallest sample size, the respondents representing each strata or cluster (like the indigenous people, the oil palm and rubber settlers, and people living in the traditional villages, just to name a few), of the districts are chosen. Among others, the advantages of using the said sampling are: one, it is quite convenient to identify the survey sample, and hence making the survey done speedily; and two, it is cost effective as the target respondents are identified prior to visiting them. Otherwise, it is quite cumbersome for the enumerators to reach the respondents if they were not a priori identified. In this study, 2133 respondents have been chosen and all of them are the heads of household.

Next, to enable us to conduct the survey, a questionnaire was developed. It is used to gather the related information pertaining to MPI from the respondents. The questionnaire that was used to formulate the MPI has four (4) parts, and they are in the following order. First, the demography, which provides the profile of each respondent. Second, the health dimension where nutrition and child mortality are the two indicators as well as about which the questions were being asked. Third, the education dimension where children failed to complete a required five (5) years of education (children enrolled) and at least a child did not go to school (years of schooling) are the two piece of information gathered. Finally, fourth, the living standards dimension of the respondents which consists of six (6)-assets (any one of the electrical appliances and vehicles) and living conditions-

related questions like sanitation, water (drinking water), flooring type (floor), electric connectivity (electricity), and type of fuel used for cooking (cooking fuel), all are shown in Figure 1.

For index formulation purposes, by virtue of MPI has three (3) dimensions, each of it is assigned a value of one-third (1/3). However, while each indicator that belongs to the first two dimensions is assigned a value of one-third (1/3), in the case of the third dimension a value of one-sixth (1/6) is attached to each of them. On another note, a value of zero (0) is assigned to each indicator if any of the respondents gave a negative answer to a question. On the contrary, a value of one (1) is assigned for any affirmative answer given by them. By summing up the values from each dimension will give a maximum value of one (1). For the sake of easiness and to facilitate the understanding as to how the value for each dimension is derived, it is mathematically shown here. For the first dimension, the values must sum up to 0.333 [(1/3 x 1/2) x 2 indicators]. Likewise, owing to them sharing the same elements and characteristics, the second dimension's value must also sum up to 0.333; as in the case of first dimension. But, for the third dimension, because it has six (6) indicators, the step taken to compute the value is slightly different; [(1/3 x 1/6) x 6 indicators]. As such, the maximum value or coefficient of MPI must always be one (1=0.333 (Education)+0.333 (health)+0.333 (Living Standards).

We have three notes in following order. First, the value of MPI ranges from 0-1 where "0" implies no deprivation at all, while "1"signifies absolute deprivation, where, to reiterate, both deprivations are in terms of basic needs. We note further that an MPI value of 0-0.24 0.333 indicates the deprivation is serene, whereas 0.250-0.333 means vulnerable. Next, if MPI is 0.34-0.50, it implies tolerable. Finally, if MPI is 0.51 and above, it means that the state of basic needs deprivation is severe. Second, MPI has two (2) components. The first component is Headcount (*H*), which is derived from the ratio of households whose basic needs deprivation is greater than 0.333 (>0.333), or *k*, to total population sample, or *N*. Simply put, $H = (k/N)$. The second component is Intensity (*A*), which is derived from the ratio of the aggregate value ($\sum_1^x k$) to the number of households (*n*) whose basic needs deprivation is greater than 0.333 (>0.333). Simply put, $A = (\frac{\sum_1^x k)}{n})$. Alternatively, *A* can be perceived as the average value of the households whose basic needs were being deprived. Technically, *MPI* is a product of *H* and *A*, or *MPI = H x A*. Third, the *sui generis* feature of MPI. Each dimension's contribution, namely Health, Education and Living Standards (in terms of percentage), to the value of MPI can be traced. Such feature helps the policy makers to have an idea of how severe is the basic needs deprivation suffered by the deprived households from each dimension. They can subsequently be used to formulate policies to mitigate it.

Finally, it is worth mentioning the four (4) criteria that is used to categorize the severity of basic needs deprivation when measured using MPI.
a) MPI (0 – 0.24) = Serene MP (Multi-dimensional Poverty)
b) MPI (0.25 - 0.33) = Vulnerable MP
c) MPI (0.34 - 0.50) = Tolerable MP
d) MPI (0.51 and above) = Severe MP

4   Results and Discussion

The results of MPI for KESEDAR and National (Malaysia) are shown in Table 1. As evident from the table, the MPI for KESEDAR is slightly higher than that of the National, pointing to the fact that the population in KESEDAR are more deprived in terms of basic needs like education, health and living standard. However, if the figure for intensity (A) is compared between the two, two distinguishable but inter-related interpretations can be made:

a) In both KESEDAR and National, the value of "A" is higher than 0.333, the cut-off or threshold for vulnerable deprivation. As such, necessary measures must be taken to mitigate the situation so that it would not turn from bad to worse.

b) With the "A" values of 0.3727 and 0.3890 (in 2016) registered by KESEDAR and National respectively, the state of deprivation seems to be higher at the latter level than the former, implying that, on average, the population in KESEDAR is less deprived in terms of basic needs than that of the National's population.

Table 1. MPI - KESEDAR and National

Level	H	A	MPI
National (2014)	0.0110	0.3966	0.0044
National (2016)	0.0086	0.3890	0.0033
KESEDAR	0.0338	0.3727	0.0126

Legend:
H = Incidence of poverty
A = Intensity
MPI = Multidimensional Poverty Index

Next, Table 2 shows the contribution of each dimension to MPI for KESEDAR. It is apparent from the table that the highest contributor was Health (51.6%) followed by Education (44.1%) and Living Standards (4.3%). From these figures it becomes obvious that although the MPI is within the Serene criterion, the deprived population in KESEDAR whose MPI was greater than 0.333 were actually being deprived most in terms of health and education. Meanwhile, if combined together, both contributed 96.7% to the basic needs deprivation of KESEDAR population.

Table 2. Contribution of Each Dimension to MPI- KESEDAR

Dimension	Percentage (%)
Health	51.6
Education	44.1
Living Standards	4.3

Table 3 shows the results of MPI by districts in KESEDAR. If a comparion is made between the district's MPI, the best performer is Kuala Krai with 0.0071 followed by Jeli (0.0083), Tanah Merah (0.0149) and Gua Musang (0.0176). However, if our view is shifted to the results showing the "A" value, the order changed significantly. Eventhough Kuala Krai still maintains as the best performer registering a value of 0.3611, Gua Musang is now in the second position (0.3713) followed by Jeli (0.3737) and Tanah Merah (0.3889). Notwithstanding, all Districts shared one common feature in terms of "A" where its value exceeded 0.333, which is the MPI threshold.

Table 3. MPI – By District

District	H	A	MPI
Gua Musang	0.0474	0.3713	0.0176
Jeli	0.0222	0.3737	0.0083
Kuala Krai	0.0195	0.3611	0.0071
Tanah Merah	0.0383	0.3889	0.0149
KESEDAR	0.0338	0.3727	0.0126

To complete the analysis, we now turn to Table 4. It shows the contribution of each MPI's dimensions for all districts. Three (3) observations can be made from the results showed in the table. First, as far as the Health dimension is concerned, Gua Musang with 48.2% is the

district that registered the least percentage, hence the least affected, while Tanah Merah is the highest (60.0%). Second, in the case of Education, Tanah Merah with 34.3% marked the least affected district, as opposed to Gua Musang with 48.2%. Third, given the results of Living Standards for all districts, Kuala Krai seems to be the least affected, while Jeli the most affected.

Table 4. Contribution of Each Dimension to MPI- By District

District/Dimension	Percentage (%) of Each Dimension to MPI			
	Gua Musang	Kuala Krai	Jeli	Tanah Merah
Health	48.2%	50.7%	56.7%	60.0%
Education	48.2%	46.1%	36.5%	34.3%
Living Standards	3.6%	3.2%	6.8%	5.7%

5   Conclusion

It is evident from the results of the study that having recorded an MPI of less than 0.333 alone will not in any way guarantee a better health and education of the deprived population. Breaking it down by component, it seems that the intensity of the deprivations occurred has exceeded the cut-off value of 0.333 which entails that the population may be prone towards increasing level of deprivation in basic needs. As the finding of this study shows, for them to have a more meaningful life, an income above the poverty line has to be coupled with a decently acceptable basic needs. To this end, it is the responsibility of the government (in this case KESEDAR management) to pave the way for more economic activities that will create more job opportunities for the poor so that they will have more disposable income to spend especially on education and health, the most two critical dimensions of MPI.

References

[1]   Abdullah, N., Mat Derus, A. and Al-Malkawi, H.-A.N. (2015), "The effectiveness of zakat in alleviating poverty and inequalities: A measurement using a newly developed technique", *Humanomics*, Vol. 31 No. 3, pp. 314-329

[2]   Allegretto, P. (2005), https://www.epi.org/publication/bp165/), Retrieved June, 2021

[3]   Haq, Mahbub ul (1995), Reflections on Human Development, New York: Oxford University Press.

[4]   Lipton, M. (1983), Poverty, undernutrition, and hunger. World Bank Staff Working Paper No. 597. Washington, DC: World Bank

[5]   Oxford Poverty and Human Development Initiative (OPHI), https://www.ophi.org.uk/wp-content/uploads/Kenya1.pdf?cda6c1, Retrieved June, 2021

[6]   Qizilbash, M. (1998), Poverty: concept and measurement, Research Report No. 12, Sustainable Development Policy Institute, and paper presented at the annual conference of Development Studies Association, University of East Anglia, September 1997.

[7]   Sen, A.K. (1993). Capabilities and well-being. In M. Nussbaum, & A.K. Sen (Eds.), The quality of life. Oxford: Clarendon Press.

[8]   Streeten, P.P. (1994), Strategies for Human Development. Copenhagen: Munksgaard International Publishers.

[9]   Townsend, P (1993), The International Analysis of Poverty, Taylor & Francis