



## **TECHNICAL NOTES ON THE ESTIMATION OF THE MULTIDIMENSIONAL POVERTY INDEX (MPI) BASED ON THE INITIAL METHODOLOGY**

### **I. Background**

In the Philippines, based on Republic Act 8425 or the Social Reform and Poverty Alleviation Act, “poor” refers to individuals and families whose income fall below the poverty threshold as defined by the National Economic and Development Authority (NEDA) and/or cannot afford in a sustained manner to provide their minimum basic needs of food, health, education, housing and other essential amenities of life. Hence, official poverty statistics being released by the Philippine Statistics Authority (PSA) are estimated based on income collected in the Family Income and Expenditure Survey (FIES).

It is recognized, however, that aside from income poverty, individuals or families may be experiencing deprivations on some of the basic needs, which may not simply be addressed by increasing income. As may be noted in one of the Development Issues of UN Department of Economic and Social Affairs (UN DESA), while an increase in purchasing power through increase in income allows the poor to better achieve their basic needs, the market for some basic needs may not always exist<sup>1</sup>. An individual who may be categorized as non-income poor, could actually be experiencing deprivation in terms of his/her health, or even peace/security. It is therefore deemed that information on the various deprivations can serve as useful inputs to complement income-based official poverty statistics in identifying priority programs that needs to be implemented to ensure poverty eradication in all its dimensions.

The Multidimensional Poverty Index (MPI) is a measure that intends to capture deprivations in various dimensions. This measure can be broken down to reveal the incidence and contribution of each indicator to the overall deprivation, thus, providing a clearer picture for the design and implementation of poverty reduction programs and policies.

### **II. Proposed Methodology**

#### **A. Data Source**

The initial MPI methodology developed by PSA, in consultation with the Interagency Committee on Poverty Statistics (IAC PovStat), uses the merged dataset of the 2016 and 2017 Annual Poverty Indicators Survey (APIS) and Labor Force Survey (LFS) conducted by PSA. The merged datasets have 5,324 families for 2016 and 4,202 for 2017. As a result of the merging of the two datasets, weights were adjusted correspondingly.

<sup>1</sup> Multidimensional Poverty, Development Issues No. 3, 31 October 2015, UN Department of Economic and Social Affairs





The MPI methodology used by PSA was adopted from the Human Development Report Office's measure of multidimensional poverty. This methodology was authored by the Oxford Poverty and Human Development Initiative (OPHI) Director Sabina Alkire and Dr. James Foster of the Washington University. This was commonly referred to as the Alkire Foster or AF method.

## B. Concepts and Definitions

**Headcount Ratio (H)** – Proportion of the population who are multidimensionally poor  
or

$$H = q/n$$

Where  $q$  = the number of people who are multidimensionally poor  
 $n$  = total population

**Intensity of Deprivation (A)** – Average deprivation score of people in multidimensional poverty or

$$A = \frac{\sum_i^q c_i}{q}$$

Where  $q$  = the number of people who are multidimensionally poor  
 $c_i$  = deprivation score that the  $i$ th person experiences  
= can be expressed as the sum of the weights associated with each indicator in which person  $i$  is deprived

**Multidimensional Poverty Index (MPI)** – Proportion of the population who are multidimensionally poor, adjusted by the intensity of deprivation among poor or

$$MPI = H \times A$$

**Share of Dimension to MPI** – Contribution of dimension  $k$  to multidimensional poverty, which can be expressed as

$$\text{Contrib}_k = \frac{\sum_{j \in k} \sum_i^q c_{ij}}{n} / MPI$$

**Incidence of Deprivation Among Families Per Indicator (I)** – Proportion of families who are deprived on  $j$ th indicator

$$I_j = d_j/n$$

Where  $d_j$  = the number of families who are deprived on  $j$ th indicator  
 $n$  = total families



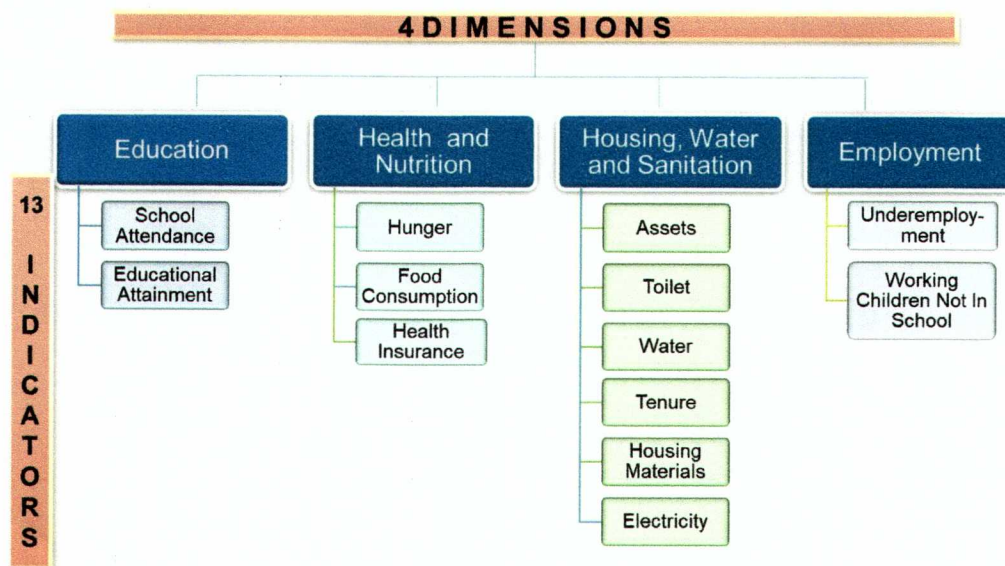
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### C. Dimensions and Indicators

In the selection of the domains and indicators, those that were adopted in the global MPI, as well as those used in other countries and studies made by Dr. Arsenio Balisacan and Dr. Gaurav Datt were initially considered.

Ultimately, however, the main consideration in the development of this initial methodology on MPI is the availability of data from the merged dataset of the APIS and LFS. Hence, the following dimensions and indicators were considered:



Below are the indicators and their corresponding weights similar to the practice in the global MPI as well as those used in many other countries. Nested uniform weights was adopted.

| Dimension | Indicator         | Weights | Description   | Rationale  |
|-----------|-------------------|---------|---|--|
| Education | School attendance | 0.125   | If any child in the family aged 5 to 17 years old is not currently attending school | A family with a school-age child not attending school is deemed deprived of the basic need for education. School attendance may not capture the quality of schooling, the level of knowledge attained or skills but it is a robust indicator that provides information that the individual is being empowered. |





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| Dimension            | Indicator              | Weights | Description  | Rationale   |
|----------------------|------------------------|---------|--|---|
|                      | Educational attainment | 0.125   | If any family member aged 18 years and over did not complete high school   | As in Alkire and Santos (2010), a family is deprived of education if not one member of the family has completed basic education (elementary and high school) which may affect the economic capacity of the family. (SDG Target 4.6)   |
| Health and Nutrition | Hunger                 | 0.083   | If at least one family member experienced hunger because there was no food to eat at least once in each week during the previous quarter | As reflected in Sustainable Development Goal 2 (SDG 2), one of the greatest challenges the world faces is how to ensure that a growing global population - projected to rise to around 10 billion by 2050 - has enough food to meet their nutritional needs. Hunger was identified as a proxy indicator to malnutrition since APIS does not currently collect anthropometric information. |
|                      | Food consumption       | 0.083   | If cost of food consumption is less than the food threshold  | This is used as a proxy indicator for malnutrition as it is assumed that families not having enough purchasing power to meet the official food thresholds are deemed to be subsistence poor and may not be able to consume the minimum nutrient requirements.   |
|                      | Health Insurance       | 0.083   | If no family member is a beneficiary/ member/ dependent of health insurance program (e.g., PhilHealth, private insurances, etc.)         | Coverage of essential health services (SDG 3.8.1) captures the impact of health spending paid "out-of-pocket" on family's budget which could imply for some families having   |



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| Dimension                     | Indicator         | Weights | Description  | Rationale  |
|-------------------------------|-------------------|---------|--|--|
|                               |                   |         |  | to choose between health and other essentials like food, and education.  |
| Housing, Water and Sanitation | Assets            | 0.042   | If it does not own: a) at least one each of the communication assets and durables; or b) at least one mobility asset                           | Asset ownership is better long-term welfare indicator than income as assets can serve as safety nets against unforeseen events like job loss, illness among families, separation between spouses, natural disasters and other possible hardships.                          |
|                               | Toilet            | 0.042   | If family does not use:<br>a) own flush toilet; or<br>b) closed pit toilet which is not shared with other families                             | Access to improved sanitation facilities prioritizes human health and stewardship towards the environment. (SDG Indicator 6.2.1)   |
|                               | Water             | 0.042   | If source of water supply is not piped into dwelling, yard/plot or protected well  | Access to safe water are considered core socio-economic and health indicators, and key determinants of child survival, maternal, and children's health, family wellbeing, and economic productivity. (SDG Target 6.1)  |
|                               | Tenure            | 0.042   | If the family resides in a:<br>a) rent-free house and lot without consent of owner; or<br>b) own house, rent-free lot without consent of owner | Security of tenure of shelter is considered as one of the basic needs in the Minimum Basic Needs (MBN) as well as in the Kilos Sambayanan of the National Anti-Poverty Commission (NAPC). It may also be recalled that this is included in the MDGs and still in the SDGs. |
|                               | Housing Materials | 0.042   | If roof and wall of the housing unit are made of salvaged or light materials   | Similar to tenure, access to a shelter that is secured is considered as part of the basic needs of an individual as may be   |



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| Dimension  | Indicator                                      | Weights | Description   | Rationale   |
|------------|--|---------|---|---|
|            | Electricity                                    | 0.042   | If there is no electricity in the housing unit  | noted in the MBN and Kilos Sambayanan<br>Reliable and affordable access to electricity saves and improves lives. Among its many benefits, electricity powers computers in schools, charges phones, keeps food cold and businesses and essential infrastructure functioning. (SDG Indicator 7.1.1) |
| Employment | Underemployment (Based on official definition) | 0.125   | If more than 50% of family members who are 18 to 65 years old, employed but express the desire to have additional hours of work in their present job or an additional job, or to have a new job with longer working hours | Employment may also be considered an independent dimension as it represents more than just a means to earning a living. The linkage of employment with life satisfaction, happiness, self-esteem, social status, mental and physical health and well-being has also been widely documented.       |
|            | Working children who are not in school         | 0.125   | If any family member aged 5 to 17 years old is working and not currently attending school   | This indicates deprivation of the child to be empowered to prepare for his/her future and the opportunity to earn and meet his/her basic needs.   |

**D. Methodology**

The Alkire Foster Method can be constructed thru the following 12 steps:

- Step 1: Choose the purpose of the measure and identify the institutional framework
- Step 2: Choose a unit of analysis (e.g. person, family, community)
- Step 3: Choose the dimensions
- Step 4: Choose indicators for each dimension
- Step 5: Set deprivation cut-offs for each indicator
- Step 6: Set and apply weights for each indicator
- Step 7: Sum the share of weighted deprivations for each unit of analysis
- Step 8: Set and apply the poverty cut-off
- Step 9: Calculate the percentage of people identified as deprived



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- Step 10: Calculate the intensity of poverty (i.e. add up all poor people's share of weighted deprivations and divide by the number of poor people)
- Step 11: Calculate the multidimensional poverty index (MPI).
- Step 12: Calculate the consistent indices: headcount ratios for each indicator, percentage contributions of each indicator to overall poverty, standard errors and coefficients of variation.

In summary, the initial methodology for the Philippine MPI has the following key elements:

|   |  |
|---|--|
| <b>1. Dimensions and Indicators</b>                 | 4 Dimensions and 13 indicators   |
| <b>2. Weights</b>                                   | Nested uniform weights<br>(Uniform weights across dimensions and uniform weights across indicators within a dimension) |
| <b>3. Identification of multidimensionally poor</b> | Poor if the deprivation score (sum of the weighted deprivation) $\geq$ poverty cutoff (k)                              |
| <b>4. Poverty Cut-off (k)</b>                       | $k = 1/3$  |
| <b>5. Aggregation</b>                               | Alkire and Foster Method   |
| <b>6. Unit of Analysis</b>                          | Family   |
| <b>7. Source of Data</b>                            | Merged APIS and LFS  |

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