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RESEARCH ARTICLE

Monitoring Child Poverty and Exclusion through the Community-Based Monitoring System (CBMS)

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This paper aims to apply the Community-Based Monitoring System (CBMS) methodology for analyzing multidimensional poverty among children. The child multidimensional poverty measured using CBMS data examines the nature and extent of deprivations of children in terms of nine (9) dimensions covering non-income and income measures of poverty. Aside from generating a child MPI using CBMS indicators at the local level, geospatial data is generated to show how the CBMS-MPI methodology can facilitate analysis of situation of children across sub-locations and how it can be used for more informed planning of appropriate interventions, and better targeted program implementation.

Using CBMS data for 1 site in the Philippines, this study demonstrates how local level data and relevant disaggregation of poverty indicators can facilitate better monitoring and diagnosis of situation of poor children and guide local planning and program action for more comprehensive analysis and targeted interventions. The study shows how CBMS data can provide additional insights and information on the nature and extent of child poverty by age, sex, income class, sub-location, and by characteristics of the households in which they belong to. CBMS poverty indicators supplement use of aggregate measure of child poverty such as MPI and enable more in depth analysis of specificities of deprivation and vulnerabilities experienced by children. The study provides insights and local evidence to research questions on who are the children living in poverty? What are the extent and nature of deprivations that poor children experience?

Limitations in the national statistical system to generate the necessary disaggregated and timely data for local planning is a major challenge in addressing child poverty and exclusion. The adoption and use of CBMS can provide the necessary data to fill in existing information gaps for monitoring child poverty, ensuring the protection of child rights, and that the needs of children are not excluded in achieving sustainable development.

Keywords: Multidimensional poverty, child poverty, community-based monitoring system (CBMS), sustainable development goals (SDGs)

JEL Codes: I32, C81, J13

Addressing child poverty in all its forms continues to be one of the emerging challenges across the world and is one of the targets of the sustainable development goals (SDGs) to which countries including the Philippines have committed to achieve. While nations commit towards the alleviation of poverty, limitations in availability of timely and necessary disaggregated data to measure, operationalize, comprehensively analyze and monitor development conditions at a given point in time, and to assess program impacts and outcomes over time remain to be a big challenge. The importance of more granular data for development planning and needs assessment becomes even more critical in the midst of limited and depleting resources, particularly in developing countries, that can be used to address poverty and inequality while at the same time managing risks and impacts of various shocks. Monitoring deprivation or poverty in all of its dimensions and ensuring that no one is excluded in the pursuit of sustainable development requires a regular source of needed data that can be used to set targets, measure achievements (gaps), and track progress.

According to the Philippine Statistics Authority (2018), better monitoring of the country's millions of Filipino children from poverty is restricted with statistics on child poverty only collected every three years. The need for a national database that includes the child well-being and deprivation indicators has been pointed out by earlier studies (Casimiro et.al, 2013) to ensure more targeted child-protection programs and a more efficient use of limited government resources.

The concept of multidimensional nature of poverty and the lack of necessary disaggregated data to measure different poverty dimensions has long been recognized (Reyes and Alba, 1994; Bibi, 2005; Asselin, 2009). The community-based monitoring system (CBMS) developed by Reyes (1994) under the Micro Impacts of Macro Adjustment Policies (MIMAP) Program aims to address information gaps for policymaking and program implementation. It was designed to generate a core set of multidimensional poverty indicators composed of income and non-income measures that can be tracked at the micro level. The CBMS, pilot tested in the Philippines in 1995, is as an organized process of collecting, processing, validation and use of data for planning and program implementation. It was developed with the necessary tools that can be adopted by local governments to generate necessary disaggregated data to (1) examine and understand the nature and extent of poverty at the household level, (2) identify priority needs for program action, (3) design appropriate policies and interventions, and (4) monitor impacts of programs and policy shocks overtime. CBMS generated data informs who and where the poor are and facilitate greater understanding of the needs to be addressed for policy and program action.

This study aims to demonstrate the application of the CBMS methodology for measurement of multidimensional child poverty. It will show how CBMS data can be used to generate multidimensional poverty index (MPI) covering additional dimensions and corresponding data disaggregation. It intends to show how child poverty indicators, generated and examined using CBMS data, can help local governments and communities better understand and address the needs of poor children in the context of protecting children's rights and meeting the SDGs. The CBMS-child poverty indicators to be generated are intended to serve as inputs in the preparation of local plans and budgets, and in the design and implementation of appropriate programs that are geared towards improving and protecting the welfare of children.

Defining Child Poverty and Exclusion

Child poverty is regarded as a complex, multidimensional and highly relational phenomenon that varies across place, time and culture and changes face across stages of childhood (Roelen, 2015). Poverty and social exclusion can be examined in the context of three major approaches (Redmond 2014): poverty as a lack of material resources (including income or consumption and material deprivation), poverty and human development (capabilities and human rights), and poverty as a social relation (relationship between people who are poor and the rest of the society). An assessment of Muniji (2005) notes that child poverty being defined as a multidimensional phenomenon requires direct policy intervention and finds that in such case, human rights principles are important factors in shaping child poverty definitions and action plans.

Child poverty and multidimensional child disadvantage can be analyzed by tackling "data exclusion" and building up the quantitative evidence base on missing and invisible children, and by highlighting importance of identifying groups of children at high risk of child poverty and multidimensional disadvantage with a view to improving measurement

and informing national monitoring excises and better-targeted policy development and practice interventions (Vizard, P. et al, 2018).

Exclusion in the context of addressing child poverty refers to the state of being deprived of opportunities and means to escape poverty and to achieve a better quality of life. This study draws from the concept of social exclusion wherein people are deprived of choices to escape from poverty and denies them of voice to claim their rights. Men, women and children who are discriminated against, for instance, often end up excluded from society, the economy and political participation and are more likely to be poor (DFID, 2005).

State of Child Poverty

About 385 million children are estimated to be living in extreme poverty globally and are concentrated in certain parts of the developing world (UNICEF and World Bank, 2016). While significant progress has been reported in reducing poverty globally, many children are still found to being left behind. An estimation of multidimensional poverty among children in 103 countries by Alkire et al (2017) found that 48% half of multidimensional poor people are children and that two out of every five children are multidimensional poor translating to about 689 million children living in multidimensional poverty; 87% of these 689 million poor children are growing up in South Asia and in Sub-Saharan Africa. Global MPI estimates also show higher MPI for children than for adults for all 103 countries. Children are also found to be deprived in more indicators at the same time.

Children are among the population sub-groups that are found to be disproportionately affected by poverty and whose poverty incidence is noted with considerable variation across countries (World Bank, 2018). An earlier study (Minujin, A., et al., 2013) examined poverty in East Asia and the Pacific and revealed the widespread and severe deprivation being faced by children in some countries like Cambodia, Lao PDR and Mongolia while other countries such as the Philippines, Thailand, Vanuatu and Viet Nam are confronted with pockets of deprived child populations and the issue of less severe deprivation.

Disparities, by location, age-groups and sex, in conditions of children have also been evident in terms of trends in health and education indicators. For instance, while there was a marked global progress in terms of reduction in under-five mortality, almost 5.4 million children under-five who died in 2017 was found mostly in sub-Saharan Africa. According to the World Health Organization, children in sub-Saharan Africa are more than 15 times more likely to die before the age of 5 than children in high income countries. Neonatal mortality was reported to be highest in sub-Saharan Africa and South Asia. In terms of educational status, while 91% of primary-school-age children globally were reported to be enrolled in school in 2015, 1 out of 5 children in secondary school age are not enrolled in school. From 2000 to 2015, the number of out-of-school children of lower secondary school age declined from 97 million to 62 million. On the other hand, of an estimated of 61 million children of primary school age were out of school of which 53% are girls. On the other hand, the lack of access to digital technology and innovation of millions of children, most of whom coming from the most deprived, was pointed out to further limit the capacities of children to gain skills and knowledge that can help them fulfill their potentials and help break intergenerational disadvantage and poverty (UNICEF, 2017).

In the Philippines, latest poverty statistics show that 31.4 percent of children belongs to poor families (PSA & UNICEF, 2015). Poverty incidence in the country has been consistently higher among children compared to adults since 2006 to 2015 with noted disparities across regions and across characteristics of heads of families. Children belonging to families with income below the poverty threshold were among the 5 of the 9 basic sectors to post the highest poverty incidence at 31.4 percent. While there was a marked decline in poverty incidence among children overtime, this sector had consistently been reported as among the top 3 basic sectors with the highest poverty incidence in 2006, 2009 and 2012 alongside farmers and fishermen.

An earlier study on child poverty in the Philippines (Reyes et al, 2014) pointed out wide variations in both income and non-income dimensions of poverty across regions, and that many children suffer from multiple and overlapping deprivations. Income-poverty among children in rural areas was found to be twice as that of children in the urban areas. There were also noted variations in severity of deprivations particularly in terms of shelter, sanitation and water across regions. The advent of economic crises and natural calamities meanwhile adds further risks for greater poverty among the young ones due to their vulnerability. On

the other hand, while there was a marked progress in reducing child mortality in the country, CORAM International (2018) reported significant variations of conditions in urban and rural areas, particularly in Autonomous Region of Muslim Mindanao (ARMM). Child immunization rates are also found to be low and in some cases declining with significant marked disparity in immunization coverage across the country. In the area of education, an estimated 39.2 million Filipinos aged 6 to 24 years old were found to be out-of-school children and youth (OSCY) (Philippine Statistics Authority, 2018). Of the 3.6 million OSCYs, 83.1% were 16 to 24 years old, 11.2% percent were 12 to 15 years old and 5.7% were 6 to 11 years old. The proportion of OSCYs was found to be higher among females (63.3%) than males (36.7%). About one-half of OSCYs belong to families whose income fall at the bottom 30 percent based on their per capita income.

Measuring Multidimensional Poverty

While there have been established methodologies i.e. the MPI (Multidimensional Poverty Index) that are being used to capture the multidimensional poverty globally, many countries still face limitation in data availability, coverage, and disaggregation that constraints a more comprehensive poverty analysis and more informed needs assessment, identification, and prioritization, and more appropriate and targeted interventions . Since there are countries without data are not included in global reports (see for example UNICEF and World Bank Group, 2016; World Bank, 2018), extent of poverty could be even higher and its nature in some regions or sub-locations and among or across population sub-groups more severe. Better information, in terms of granularity and regularity, are still needed for greater efficiency in decision making, to point out how or where to specifically accelerate efforts, or measure the success (gaps) of efforts in addressing poverty.

Wasswa (2015) examined multidimensional child poverty and its determinants using data from Uganda to generate MPI and noted that the definition of multidimensional child poverty is limited by availability of data at the local context wherein case, there is a lack of data on some child-specific indicators and dimensions, and that different datasets and indicators of multidimensional poverty were used for different age groups thus the results obtained for the groups of children are not directly comparable. A study in Bhutan (Alkire, Dorji, Gyeltshen, & Minten, 2016) on multidimensional poverty measurement using MPI and data from the Bhutan Multiple Indicator Survey, for instance, found that while it was able to generate estimates of multi-dimensionally poor children, measure the percentage of deprivation areas (in %) in which they are deprived of, and their intensity of poverty, the study recognized that the research findings could not be generalized due to limitations in data coverage. The Philippine Statistics Authority (PSA) has adopted the Alkire-Foster Method for initially developing a multidimensional poverty index using available data generated from existing PSA surveys (i.e. annual poverty indicator survey among others). The initial methodology developed by PSA identified 13 indicators across four dimensions which include (1) education, (2) health and nutrition, (3) housing, water and sanitation, (4) employment dimension.

The community-based monitoring system (CBMS) (Reyes, Mandap, Quilitis, Bancolita, et. Al, 2014) is being implemented by many local government units (LGUs) in the Philippines since 2000 up to the present as a tool for local planning, needs identification, prioritization, and program implementation. It is an organized and LGU-based process of data collection, data processing and database building using structured tools and training modules. The system monitors a core set of multi-dimensional poverty indicators covering health and nutrition, education, income, employment, access to safe water and sanitation, shelter and peace and order. The CBMS generates household and individual level data that can be disaggregated by sub-location/geo-political unit, household/individual socioeconomic characteristics (i.e. gender, age-group, ethnicity, income-class, disability status, and access to programs among others). Aside from the Philippines, the use of CBMS methodology for multidimensional poverty analysis (Reyes & Due, 2009) and to examine other thematic issues have also been developed and pilot tested in over 20 countries in Asia, Africa, Latin America and North America. Its use for developing and generating local level SDG indicators including MPI and for SDG profiling of communities have been tested in the Philippines, Botswana, Burundi, Ethiopia, Ghana, Kenya, Togo, Uganda, and Nicaragua[1].

The use of CBMS data for developing composite indices for multidimensional poverty analysis was first done by Reyes, Valencia, Ilarde and Bancolita (2004). Two methods were explored by the study to

generate a composite index. One, a simple scoring method- wherein weights are arbitrarily identified and require simpler statistical procedure, and the other, a categorically weighted composite indicator which derives weights from multiple correspondence analysis (MCA). Using a simple scoring method, the CBMS composite index (CCI) was developed which allows ranking of nature and extent deprivation of households in a particular village, city, municipality or province. The CCI, which combines a core set of multidimensional poverty indicators generated from CBMS data, can further be disaggregated and examined across sub-population groups (i.e. age, gender, ethnicity, income class, urban/rural and others). This allows for identification of priority areas, and facilitates more focused targeting and implementation of needed interventions.

Protecting the Child's Rights and the Role of Local Governments

As part of the Philippine Government's commitment to implement the provisions on the Convention of the Rights of Children, a National Plan of Action for Children through the Council for Welfare for Children (CWC) has been formulated since 1991[2]. The Philippine Action Plan for Children (PAPC) was later followed by the formulation of Child21, a 25-year strategic framework for planning programs and interventions on the rights of Filipino Children. Under Executive Order No. 310 issued in November 2000, local government units (LGUs) are enjoined to integrate Child 21 in their local development plans and budgets.

The LGUs, in a decentralized structure like the Philippines, are the front liners in the fight against poverty and in mainstreaming national development priorities and commitments at the local level. In particular, LGUs are mandated to assume the primary responsibility for the provision of basic services and facilities and the improvement of the quality of life of their constituents. With the limitations in availability and accessibility of data from national statistical system, LGUs in the country invest resources in the adoption of the community-based monitoring system (CBMS) since 2000 to present for purposes of preparation of local plans (including local poverty reduction action plans among others), resource allocation and implementing programs relating to various thematic concerns including poverty reduction, gender and development, migration and development, monitoring child labor, disaster risk reduction and management, and localizing the MDGs (now the SDGs) among others.

Some Key Issues and Developments in Local Planning

Official statistics are reliable down to the regional and provincial levels only. While the national statistical system in the Philippines generates some local level data through conduct of surveys, the sampling design of many of these surveys provide estimates of variables only at the provincial level. Moreover, the collection of data is few and far in between, and data processing adds a few more years so that its usefulness for policy and program design diminishes.

On the other hand, available data comes from different surveys, censuses and administrative records of line agencies and in most instances collected with different reference periods, methodologies and indicators. Given these, it is not possible to come up with a comprehensive picture of the different dimensions of poverty for a particular household or groups of population at a given point in time.

Since 2000 to present, LGUs in 78 of the 82 provinces (33 of which have implemented Province-wide) covering at least 1099 (of the 1400) municipalities, 11 cities and about 31,070 barangays (villages) have adopted CBMS as a tool for local planning and governance and in filling in data requirements for poverty reduction, gender and development, migration and development, disaster-risk reduction management and climate change adaptation, and localizing/monitoring the MDGs among others. The implementation of CBMS by LGUs at the local level provides local planners and authorities with household and individual level data that can be used to compute for measures of extent and nature of multidimensional poverty at the local level. Moreover, CBMS data facilitates a more comprehensive analysis of the development status of each of the subgroups of population and households at a given point in time based on the different measures of poverty since data is collected at the same reference period. With CBMS data, individuals or households across localities and subpopulation groups can be categorized as (1) health poor, (2) nutrition poor, (3) housing poor, (4) water poor, (5) sanitation poor, (6) education poor, (7) income poor, (8) job poor, and (9) security poor. This enables the design of needed programs and more focused

targeting given a better and more comprehensive understanding of the nature and extent of poverty of households/individuals across relevant disaggregation of identified poverty measures.

Methodology and Data Sources

This study aims to contribute in monitoring and analyzing child poverty by applying the CBMS methodology to capture multidimensional poverty of children covering more dimensions of deprivations and generating further data disaggregation that can be used by local planners for identification of specific needs for priority action and program intervention. The global MPI relies on existing national data sets, which are mostly and often generated from sample surveys, the CBMS-MPI generated by this study uses data gathered from a household census administered by trained LGU/ community personnel at a given point in time and can be monitored at the local level overtime.

The Community-Based Monitoring System

The key features of the CBMS are as follows: (1) It is LGU-based, (2) It taps existing LGU personnel as monitors, (3) It has a core set of indicators that monitors multidimensional poverty taking into account specificities of communities (local context), (4) It establishes local level database at each geopolitical level, and (5) It uses freeware.

Data, generated from the implementation of the CBMS, is collected and processed by trained local enumerators and data processors using a structured set of tools and instruments. Data is collected through a household census where information on each and every member of the household within a community is gathered. Aside from demographic data, the CBMS gathers and monitors information on a core set of multidimensional poverty indicators which cover income and livelihood, health and nutrition, education, access to safe water and sanitation, housing and security.

CBMS Indicators

The CBMS was designed to monitor a core set of multidimensional poverty indicators- comprised of outcome and impact indicators- covering 9 dimensions: (1) health, (2) nutrition, (3) access to water and (4) access to sanitation. (5) education, (6) income, (7) employment, (8) housing and (9) security. These CBMS indicators, and their corresponding disaggregation, are generated using household and individual level data collected from the conduct of a CBMS household census. The CBMS indicators can be combined to generate a composite index, based on the multi-dimensional concept that is being measured (Bancolita & Alvarado, 2006; CBMS Network Team, 2009).

Table 1. *CBMS Data on Children*

Dimension	Global Child Rights Indicators	CBMS Data
Child Survival	Under-five mortality rate/ Number of Deaths Under Five/Infant Mortality Rate/ Number of Infant Deaths Number of Infant deaths	Number and Proportion of children who died by age, cause of death and household characteristics
Child Health	Pneumonia/Diarrhea/Acute Respiratory Infection as a cause of death under five	Number and Proportion of children who died by age, cause of death and household characteristics
Child Nutrition	Malnutrition Rate	Number and Proportion of Children who are malnourished by age, sex, ethnicity, PWDs, income class and other household characteristics
Maternal Health	Maternal Mortality	Number and proportion of women who died due to pregnancy related causes
Water and Sanitation	Access to Safe Drinking Water	Number and Proportion of Children in Households with Access to Safe Drinking Water by age group, sex, sub-location, ethnicity, PWDs, source of water supply and other household/individual level characteristics
	Access to Safely Managed Sanitation Facilities	Children in Households with Access to Sanitary Toilet Facilities by age group, sex, ethnicity, sub-location and other household/individual level characteristics

Education	School Participation/Enrolment/Survival Ratios by Educational Level/Literacy rate	Children who are attending school by level of education, age group, sex, ethnicity, PWDs, income-class, sub-location and other individual/household level characteristics
		Children who are literate by age group, sex, ethnicity, PWDs, sub-location, income-class, and other individual/ household level characteristics
Adolescents	Proportion of Adolescents aged 10-19 in the global population	Population aged 10-19 by sex, ethnicity, PWD, sub-location, income class and other household characteristics
Early Child Bearing		Girls under 18 years old who have children by sub-location, ethnicity, educational status, income class and other individual/household characteristics
Child Disability		Number and Proportion of Children who have disability by type of disability, age, sex, ethnicity, educational status, income class and other individual/household characteristics.
Child Protection		
Birth Registration	Percentage of children age 5 whose births are registered by sex, place of residence and household wealth quintile	Number and Proportion of children whose births are registered by age group, sex, ethnicity, disability, sub (geopolitical)-location, income class, and other household characteristics.
Child Labour	Percentage of children aged 5-14 years engaged in child labour (by sex, place of residence, and household wealth quintile)	Number and Proportion of working children by age group, sex, status and sector of employment, occupation, and ethnicity, disability, educational status, sub (geopolitical)-location, income class, and other household characteristics.
Child Marriage	Percentage of Women Aged 20 to 24 years who were first married or in union before ages 15 and 18	Number and Proportion of Population below 18 by civil status

CBMS Data on Children

The CBMS collects several data on the different dimensions and indicators of children's rights that can be disaggregated by age, sex, ethnicity, and other socioeconomic characteristics. Moreover, since household and individual level data is collected at the same point in time, situation of children can further be understood in the context of their household characteristics and environment.

Measuring Multidimensional Poverty Among Children: CBMS Approach

Generating CBMS-Child MPI

Composite indices provide a useful statistical measure of overall performance over time and across countries. It can be used to rank and prioritize localities and groups. On the other hand, composite indices such as the MPI have limited use for policy response. One needs simple indicators to know what the specific deprivations are. These indicators can also be generated using CBMS data. Indicators can be further disaggregated and analyzed across sub-population groups and/or household/individual characteristics with CBMS data for a given point in time. Improvements (deterioration) in specific areas of deprivation by individuals/households can also be monitored since CBMS generates panel data.

A multidimensional poverty index (MPI) for children was calculated using relevant data from 2 CBMS census rounds in one city in the Philippines. Supplemented with the relevant CBMS data disaggregation for each dimension of poverty, the computed city level-CBMS-Child MPI provides more in depth poverty diagnosis and would guide local decision makers in identifying appropriate and more targeted program actions.

Table 2. *CBMS Indicators for Generating Child MPI*

Dimension	CBMS Indicators	Weights
Health	Children in households with children under 5 years old who died	1/9
Nutrition	Malnourished children 0-5 years old	1/18
	Children who experienced food shortage	1/18
Housing	Children in households living in makeshift housing	1/18
	Children in households who are informal settlers	1/18
Water	Children in households without access to safe water supply	1/9
Sanitation	Children in households without access to sanitary toilet facility	1/9
Education	Children 6-15 years old not attending school	1/9
Income	Children in households with income below food threshold	1/9
Employment	Working Children	1/9
Security	Victims of crime	1/9

An MPI for children, with age 0-17 years old, was computed and examined by the study taking into account indicators across nine dimensions of poverty. For selected indicators i.e. housing, access to water and sanitation and income where data is collected at the household level, the study assumes that the members of the households have the same conditions as that of the household in which they belong. The CBMS-Child MPI covers nine dimensions wherein a child can be categorized if he/she is:

- **Health Poor**: If a child belongs to a household with at least 1 child who died
- **Nutrition Poor**: If a child is malnourished and/or have experienced hunger/food shortage
- **Housing Poor**: If a child is living in makeshift housing and/or belongs to an informal settler household
- **Sanitation Poor**: If a child belongs to a household that does not have access to sanitary toilet facilities
- **Water Poor**: If a child belongs to a household that does not have access to safe water
- **Education Poor**: If a child is not attending school
- **Income Poor:** If a child belongs to a household with income below the food threshold
- **Job Poor:** If the child is working
- **Security Poor:** If a child has been a victim of crime

Identifying Deprivations in Each Dimension and Assigning Weights/Deprivation Scores

To identify the multi-dimensionally poor, deprivation scores are assigned to each indicator of each dimension. Poverty (or deprivation) among children is identified across 9 dimensions: health, nutrition, housing, water, sanitation, education, income, employment and security using 11 CBMS indicators. Children who experience deprivation in more than one ninth of these weighted indicators fall into the category of multi-dimensionally poor. Each of the dimensions receives an equal weight of 1/9 (0.1111).

Calculating the CBMS-Child MPI

Table 3 shows how MPI is computed using CBMS data. Assume that there are six households with children (household members with age 17 years old and below), and the number of members per household is shown in the table below. Household size is included to take into account its effect on the child poverty indicators. Assume also that Household No. 5 has no children 5 years old and below.

Step 1. Identify the deprived households and assign weights

Households deprived in each indicator are assigned the corresponding weights of each indicator discussed earlier. If there are no eligible household members for an indicator, for instance: there are no children 0-5 years old to measure data on nutrition, then the

Table 3. *Hypothetical example in the computation of MPI Using CBMS data*

Indicators	Household					
	1	2	3	4	5	6
Household size	4	7	5	4	3	8
Health						
Children in households with children under 5 years old who died	0.0000	0.1111	0.0000	0.0000	0.0000	0.0000
Nutrition						
Malnourished children 0-5 years old	0.0556	0.0000	0.0000	0.0000	.	0.0000
Children who experienced food shortage	0.0000	0.0000	0.0000	0.0556	0.1111	0.0000
Housing						
Children in households living in makeshift housing	0.0000	0.0556	0.0000	0.0000	0.0000	0.0000
Children in households who are informal settlers	0.0000	0.0000	0.0000	0.0000	0.0556	0.0000
Water						
Children in households without access to safe water supply	0.0000	0.1111	0.0000	0.0000	0.0000	0.1111
Sanitation						
Children in households without access to sanitary toilet facility	0.0000	0.0000	0.0000	0.0000	0.0000	0.1111
Education						
Children 6-15 years old not attending school	0.0000	0.0000	0.0000	0.0000	0.0000	0.1111
Income						
Children in households with income below food threshold	0.0000	0.0000	0.1111	0.0000	0.0000	0.0000
Employment						
Working Children $H = \frac{q}{n}$	0.0000	0.1111	0.0000	0.0000	0.0000	0.1111
Security						
Victims of crime	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Household Deprivation Score	0.0556	0.3889	0.1111	0.0556	0.1667	0.4444
Censored Deprivation Score	0.0000	0.3889	0.0000	0.0000	0.1667	0.4444

Source: Author's sample computation

indicator weight will be readjusted accordingly, such that the other indicator on nutrition is given a weight of 1/9 to represent the nutrition dimension. For Household No. 5 with no eligible members to measure nutrition indicator, the household was assigned the weight 'missing' (.) and the child weight indicator received the full weight of 1/9 (0.1111).

Note that the maximum deprivation score is 1, which is the sum of all the equal weights of each dimensions, 0.1111.

Step 2. Get the deprivation score

Deprivation score refers to the sum of the weights of each indicator per household. A deprivation score above 1/9 indicates that the household is multidimensionally poor.

Step 3. Get the censored deprivation score

A household with deprivation score below or equal to 1/9 is not considered multidimensionally poor. This is true with Households 1 and 4. Censored deprivation score for these households is set to 0. The censored

deprivation vector is only obtained from the households who are multidimensionally poor.

Step 4. Compute the headcount ratio (H) and intensity of poverty (A)

Headcount ratio refers to the proportion of the multidimensionally poor in the population. It is calculated as the ratio of the number of people who are multidimensionally poor to the total population:

$$H = \frac{q}{n}$$

Where:

H= headcount ratio
q = population who are multidimensionally poor
n = total population

Note that if the household is deprived, then all the members in that household are also deprived. The headcount ratio, in the case of this study, is the proportion of children living in poverty in all its dimensions.

The intensity of poverty refers to the average deprivation score of those who are poor. This is computed as:

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

Where: A= intensity of poverty
c_i = censored deprivation score that the i^{th} poor individual is experiencing
q = population who are multi-dimensionally poor

In the above example, the headcount ratio is (7+3+8)/31=0.58 or 58%. On the other hand, the intensity of poverty is (0.3889*7 + 0.1667*3 + 0.4444*8)/18=0.37653 or 37.65%. Censored deprivation scores of the Households 1, 3 and 4 are excluded in the computed because these households are considered as non-poor based on their total deprivation scores. Note that intensity of poverty is only computed for those households classified as poor.

Step 5. Compute for the MPI

The MPI is computed as the product of the headcount ratio and intensity of poverty. From the example presented, the MPI value is 0.21839 or 21.8%.

Research Results

Table 4 shows the computed CBMS-Child MPI derived from the CBMS census 2010-2012, and 2015-2016 rounds of a city with about 39,152 households and a population of 156,385 where least 58,769 (37.6%) are children. Based on the latest data of the locality, about 31.16 % of children are multi-dimensionally poor. The situation has slightly improved by .04% since 2010-2012.

In terms of intensity of poverty, on the average, latest CBMS data shows that a poor child is deprived in 22.73 % of the weighted indicators. Intensity of poverty experienced by children has slightly decreased since 2010-2012, wherein average deprivation is marked at 23.57%.

CBMS data for 2015-2016 in the study site (Table 5) reveal that 43.87% of poor children are deprived in at least 1 dimension, while about 27.18% are poor in at least 2 dimensions. About 2039 poor children are deprived in at least 3 dimensions. There were 220 children who are deprived in at least 4 dimensions of poverty.

From 2010-2012 to 2015-2016, children who did not experience deprivation has increased from 19.38% to 24.97%. There was an observed decline in the proportion of poor children who are deprived in more than 2 dimensions. Poor children who have experienced deprivations in 3 dimensions have declined by 2.69% while those who are deprived in 4 dimensions decreased by .64%. Similarly, there was a marked decline in poor children that are deprived in at least 5 dimensions. There were no poor children in the locality who are deprived in more than 6 dimensions. On the other hand, latest data from the locality show that the poor children who are deprived in 2 dimensions has increased by 2.74%.

Data on children in the CBMS site showed improvements in the development situation in the areas of education, housing, sanitation, employment, and security (Table 6). The proportion of water poor-children has declined by 10.78 %. Similarly, there was a marked reduction in sanitation poor children from 4.89 to 2.58 %. Education poor children had also decreased from 4.58 to 1.8 percent.

On the other hand, CBMS data reveal an increase in the proportion of income-poor and health-poor children in the locality. Based on the CBMS data for 2015-2016 across all villages in the locality, the

Table 4

Multi-dimensionally Poor Children in 2010-2012 and 2015-2016

Dimension	Indicators	2010-2012					2015-2016				
		Weights	Censored Headcount (CH)	CH Ratio	Weight X CH Ratio	Contribution	Weights	Censored Headcount (CH)	CH Ratio	Weight X CH Ratio	Contribution
Health	Children in households with children under 5 years old who died	0.1111	33	0.0006	0.0001	0.0009	0.1111	46	0.0008	0.0001	0.0013
Nutrition	Malnourished children 0-5 years old	0.0556	140	0.0026	0.0001	0.0019	0.0556	237	0.0042	0.0002	0.0033
	Children who experienced food shortage	0.0556	611	0.0113	0.0006	0.0084	0.0556	262	0.0046	0.0003	0.0036
Housing	Children in households living in makeshift housing	0.0556	2912	0.0539	0.0030	0.0399	0.0556	1240	0.0219	0.0012	0.0171
	Children in households who are informal settlers	0.0556	2141	0.0396	0.0022	0.0294	0.0556	1948	0.0343	0.0019	0.0269
Water	Children in households without access to safe water supply	0.1111	14362	0.2657	0.0295	0.3939	0.1111	16035	0.2826	0.0314	0.4426
Sanitation	Children in households without access to sanitary toilet facility	0.1111	2277	0.0421	0.0047	0.0624	0.1111	1308	0.0230	0.0026	0.0361
Education	Children 6-15 years old not attending school	0.1111	2178	0.0403	0.0045	0.0597	0.1111	893	0.0157	0.0017	0.0247
Income	Children in households with income below food threshold	0.1111	13894	0.2570	0.0286	0.3810	0.1111	15462	0.2725	0.0303	0.4268
Employment	Working Children	0.1111	471	0.0087	0.0010	0.0129	0.1111	347	0.0061	0.0007	0.0096
Security	Victims of crime	0.1111	135	0.0025	0.0003	0.0037	0.1111	22	0.0004	0.0000	0.0006
	Total	1.0000	39154	0.7242	0.0745	0.9942	1.0000	37800	0.6661	0.0704	0.9926
	Total children population	54062		17685			56748				
	MPI poor children population	17189		**0.3116**							
	headcount ratio	0.3179		**0.2276**							
	Intensity (A)	0.2357		**0.0709**							
	MPI	0.0749									

Source of Basic Data: CBMS Census 2010-2012 and 2015-2016, CBMS site, Philippines

Table 5. M*agnitude and Proportion of Deprivations Among Children*

No. of Deprivations	2010-2012			2015-2016		
	Magnitude	Proportion	Average Deprived Children	Magnitude	Proportion	Average Deprived Children
0	10,475	19.38		14,168	24.97	
1	26,389	48.81		24,895	43.87	
2	13,214	24.44	0.49	15,426	27.18	0.54
3	3,396	6.28	0.19	2,039	3.59	0.11
4	537	0.99	0.04	196	0.35	0.01
5	48	0.09	0.00	23	0.04	0.00
6	3	0.01	0.00	1	0	0.00
7	0	0	0.00	0	0	0.00
8	0	0	0.00	0	0	0.00
9	0	0	0.00	0	0	0.00
Total	**54,062**	**100**	**0.72**	**56,748**	**100**	0.67

Table 6. *Magnitude and Proportion of Children who are Poor by Dimension*

Dimensions	2010-2012		2015-2016	
	Magnitude	Proportion	Magnitude	Proportion
Health	39	0.07	51	0.09
Nutrition	812	1.50	574	1.01
Housing	5,517	10.20	3,661	6.45
Water	33,491	61.95	29,037	51.17
Sanitation	2,644	4.89	1,466	2.58
Income	19,681	36.40	26,482	46.67
Livelihood	568	1.05	448	0.79
Education	2,478	4.58	1,020	1.80
Security	181	0.33	30	0.05

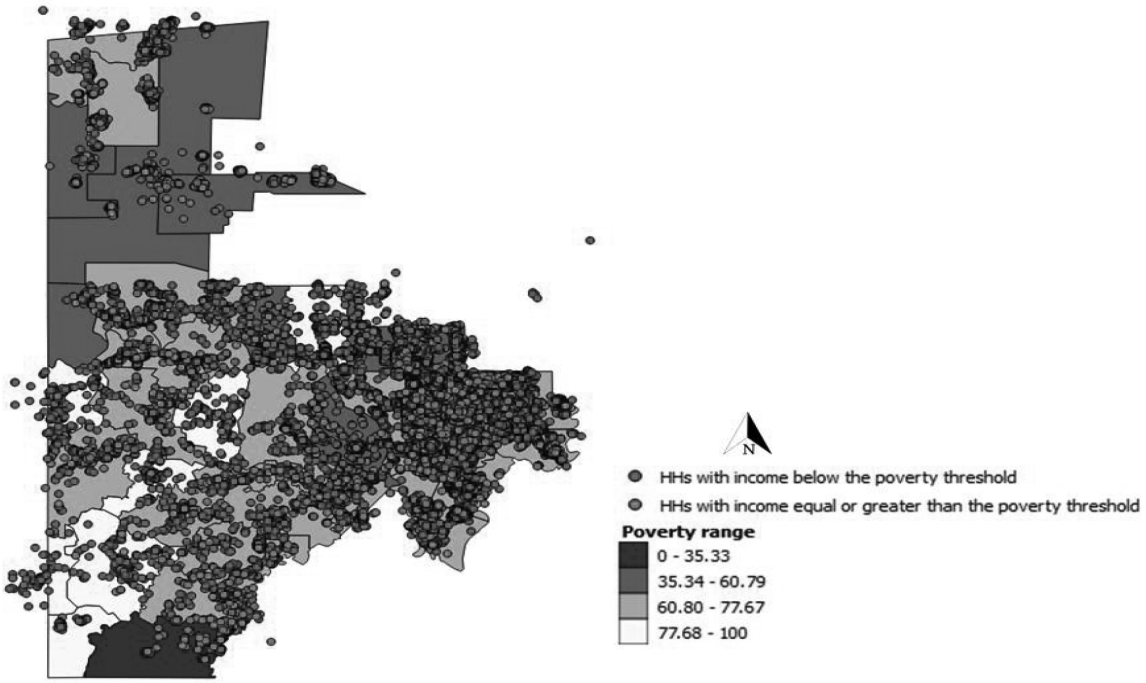
proportion of income poor children has increased by 10.27 percent while health poor children slightly went up by .02 percent. The income poor children belong to households who have insufficient incomes to cover basic food needs. Income poverty among children using CBMS data is measured by computing for the proportion of households, with children 0-17 years, whose household income is below the food threshold (benchmark was the provincial food threshold).

Location of income poor children may further be identified using geospatial data that are also collected simultaneously from the conduct of the CBMS census during the period (as shown in Figure 1). Analysis of the data indicate that the highest proportion of income poor households with children whose income is below the food threshold are found in 3 of the 40 barangays (villages) in the locality wherein Barangay 1 has 94.6% income poor children, Barangay 2 has 89.1%), and Barangay 3 has 89.03% income poor children. Similar poverty maps may also be generated using CBMS data to further show the location of poor children who have experienced in multiple or overlapping deprivations at a given point in time.

For instance, further processing of CBMS data as shown in Figure 2 reveal that 62.5 percent of households with at least 1 child, 0-4 years old, who died, are also identified as income poor. Aside from the actual geographical location of households with

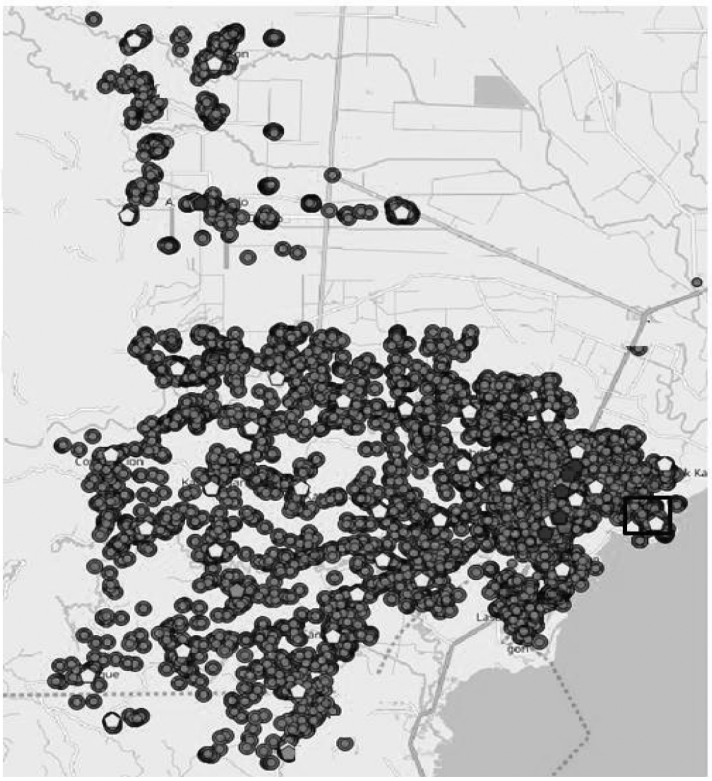
Table 7. *Proportion of Households with Income below the Food Threshold by Barangay*

Barangay	Proportion of households with income below food threshold	Barangay	Proportion of households with income below food threshold
1	45.5	23	59.7
2	64.9	24	55.0
3	73.1	25	67.4
4	78.2	26	58.9
5	67.4	27	53.7
6	89.0	28	50.1
7	38.0	29	50.2
9	54.5	30	75.7
10	64.0	31	87.2
11	62.2	32	61.8
12	71.2	33	9.9
13	94.6	34	44.2
14	71.0	35	68.3
15	62.4	36	51.6
16	57.2	37	72.0
17	74.7	38	54.7
18	89.1	39	74.2
19	62.7	40	86.6
20	69.8	41	61.0
Total	**60.79**	Total	60.79

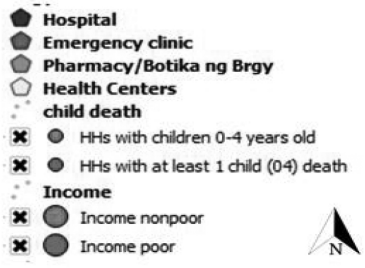


Source of Basic Data: CBMS Census 2015-2016. Selected site, Philippines.

Figure 1. Income poor children in selected CBMS site



Crosstabulation		Poverty status		
Death of children 0-4		Nonpoor	Poor	Total
HHs with children 0-4 years old	Magnitude	4,239	7,966	12,205
	Proportion	35	65.27	100
HHs with at least 1 child (0-4) death	Magnitude	9	15	24
	Proportion	37.5	62.5	100
Total	Magnitude	4,248	7,981	12,229
	Proportion	34.74	65.26	100



Source of Basic Data: CBMS Census 2015-2016. Selected site, Philippines

Figure 2. Income Poor and Health Poor Children in Selected CBMS site

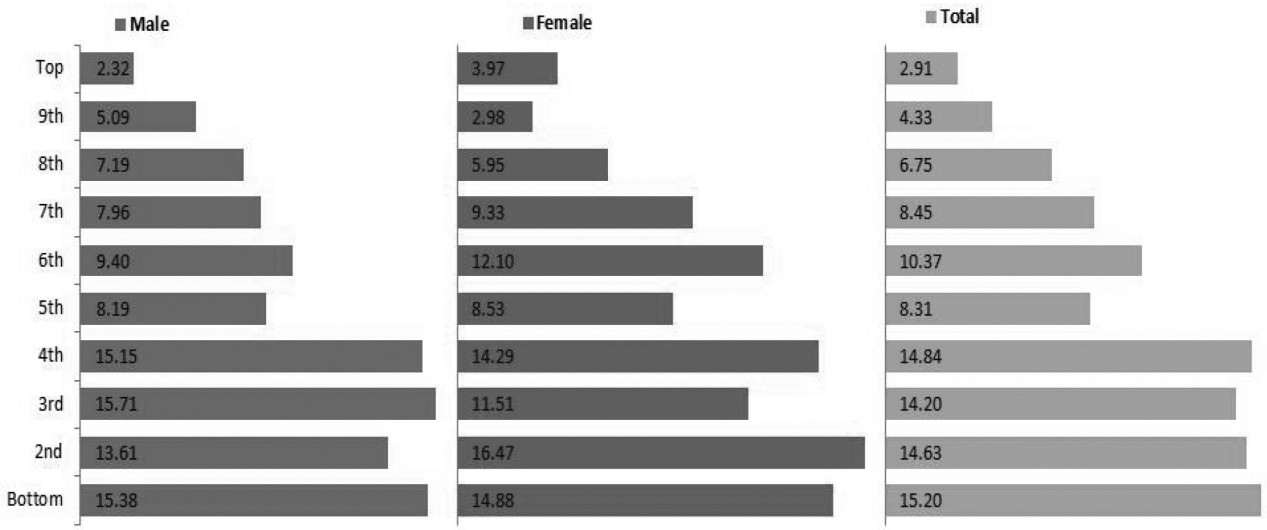


Figure 3. Children not Attending School, by Income Decile, 2015-2016

children who were identified as both income poor, and health poor, the map shown in Figure 2 also shows the location of health facilities in the locality. One would note the efforts of the local government to provide necessary health service infrastructures across the villages. In spite of proximity to health facilities, there are still households with children who are health poor. In line with this, further analysis of the reasons for child deaths as well as of the quality of available service facilities may be necessary to enhance existing health program initiatives in the locality.

Figure 3 shows CBMS data that points out to disparities in the condition of children in the study site in terms of educational status across sex and income class. Among female children, the highest percentage of children not attending school belong to the 2nd income decile (16.47%). On the other hand, the highest percentage of children not attending school among male children belong to the 3rd decile (15.71%). Proportion of female children not attending school is higher compared to that of males, for children who belong to the top, 7th, 6th, 5th, and 2nd income deciles.

Key Findings and Recommendations

Limitations in the availability of disaggregated data from national statistical system as well as differences in reference periods and methodologies of existing administrative records of line agencies pose restrictions for monitoring and assessing child poverty and social exclusion and identification of priority needs at a given point in time. This in turn has crucial implications in the design and implementation of appropriate plans and programs and allocation of resources geared towards implementing programs that are responsive to the needs of children and other vulnerable population.

While a single measure such as a composite index like MPI is useful for comparing and ranking of general situation of children across countries, it is equally important to examine specific indicators for each area of deprivation for more informed policy and program decisions. The global MPI methodology looks at 3 dimensions of poverty including health, education and living standards. It generates MPI from available data generated by national statistical system that are mostly collected from sample surveys thus have limitations in terms of more comprehensive analysis of the nature and extent of poverty that can be used for program design, targeting and needs prioritization.

The CBMS-MPI methodology, on the other hand, allows for the examination of additional/ other dimensions and indicators of poverty that are equally important for a more comprehensive poverty analysis and better understanding of the development situation of sub-groups of population including children. The CBMS-MPI, which uses socioeconomic and demographic data generated from a household census, can facilitate identification of specific areas of deprivation and needs of sub-groups of population for priority program action. Since it utilizes data from a household census, it allows for measurement of simultaneous and/or different deprivations being experienced by particular groups of population, in this case children (and their households) at a given point in time. Moreover, with the CBMS-Child MPI methodology, additional dimensions and child poverty data can be generated and examined at the lowest administrative level, and thus be very useful for policy and program implementation for monitoring improvements in child poverty and ensuring protection of children's rights overtime.

Notes

[1] Implemented by CBMS partner institutions in these countries with technical support from the CBMS Network Office based in Manila, Philippines

[2] The CWC is the highest policymaking body in the country mandated to formulate long range programs for the welfare and best interest of children.

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