METHODOLOGY

2.1 Alkire-Foster approach to multidimensional poverty measurement

The Alkire-Foster approach is a widely used method for measuring multidimensional poverty. It provides a framework for capturing poverty by considering multiple dimensions simultaneously, rather than relying solely on income or consumption-based measures. It first identifies who is poor, by summing up the deprivations each person experiences in a weighted deprivation score, and then aggregates this information into a headline and associated information platform for a given population. This methodology for multidimensional poverty measurement has come to be widely used because it's a simple, yet specific approach. There are three key features for any Multidimensional Poverty Index (MPI):

- **Incidence or headcount ratio (H)** is the proportion of the population who are multidimensionally poor.
- **Intensity (A)** refers to the severity or depth of poverty experienced by individuals or households.
- **MPI or adjusted headcount ratio** is the multidimensional poverty index, which is the product of incidence and intensity (MPI = H × A).

The MPI can be equivalently computed as the weighted sum of censored headcount ratios – which shows the percentage of people who are identified as poor and are also deprived in an indicator. The MPI is always broken down by indicator to show the composition of multidimensional poverty. This feature of dimensional detail brings added policy relevance to the analysis. In addition, the MPI can be disaggregated by different population groups, such as, urban or rural areas, age groups, and employment characteristics.

The AF method allows for the structure of an MPI - dimensions, indicators, weights, and cut offs to be adapted to the specific purposes and contexts. The structure of Ghana's district MPI is presented below.

2.2 Properties of the Multidimensional Poverty Index

In addition to being intuitive and simple to compute, the Alkire-Foster poverty measure, Mo possesses useful properties for policy analysis. The first is that Mo is sensitive to both the prevalence (and incidence) of poverty (H) and to its breadth or intensity (A) since it can be expressed as a product of the two measures (Alkire et al., 2015a) as:

$$M_0 = H \times A = \frac{q}{n} \times \frac{\sum_{i=1}^{n} c_i(k)}{qd}$$

The second feature of Mo is that it can be broken down by different mutually exclusive and collectively exhaustive population subgroups such as rural or urban areas, regions or socio-demographic groups of people. To illustrate this feature, suppose, there are population subgroups whose achievement matrix is X. Let s= 1, 2...m denote ns people in the subgroup s such that, $\sum_{s=1}^{m}$ ns=n and Xs is an nsxd matrix of achievements of all people in the subgroup. Then, Mo can be expressed as a weighted average of the subgroup adjusted headcount ratios,

$$\sum_{s=1}^{m}\left[\left(\frac{n_s}{n}\right)M_0^s(X_s)\right]$$

where the weight is the population share $(\frac{n_s}{n})$. The contribution of each subgroup to the overall poverty measure Mo is given by:

$$C_s = \frac{\left[\left(\frac{n_s}{n}\right)M_0^s\right]}{M_0}$$

This feature is also known as subgroup decomposability and is useful for understanding the contribution of different subgroups to overall poverty levels. Note that the contribution of a subgroup to the overall poverty depends both on the poverty level of that subgroup and that subgroup's population share. Whenever the contribution to poverty of any subgroup widely exceeds its population share, this suggests an unequal distribution of poverty, implying that the subgroup is bearing a disproportionate share of poverty (Alkire and Santos, 2011).

The third feature of is that, once it has been computed and the deprivations of the non-poor have been censored, one can look at the Censored Headcount (CH) ratios for each indicator. The Censored Headcount ratio of an indicator is the proportion of the population that is multidimensionally poor and deprived in that indicator at the same time. It is calculated by simply adding up the number of people who are poor and deprived in that indicator and dividing by the total population.

2.3 Alkire-Foster methodology applied to Ghana District MPI analysis.

The District MPI for Ghana applies a set of dimensions, indicators and cut-offs that reflect its priorities expressed as a consensus from the District MPI Steering Committee comprising Ministries, Departments and Agencies (MDAs) and development partners, and that can

be implemented using the Ghana 2021 Population and Housing Census (2021 PHC) dataset. The section also describes the choice of these parameters.

2.4 Unit of identification and analysis

The unit of identification refers to the entity that is identified as poor or non-poor – usually the individual or the household. In the case of Ghana's MPI, the unit of identification is the household, which considers information of all household members. This acknowledges intra-household caring and sharing – for example, if school non-attendance is a deprivation (i.e., children between the ages of 4 and 15 not attending school), then it is assumed that this deprivation affects not only the child who is not attending school, but also the entire household. This means that all other individuals living in this household are considered deprived with respect to this dimension/indicator (school attendance). One of the main reasons for making this assumption is that a household-based multidimensional poverty measure is arguably more consistent with the traditional poverty measures based on household consumption expenditure.

The unit of analysis which refers to how the results are reported and analysed is the individual person. It forms the basis of the analysis and subsequently informs the reporting of results, as is customary for monetary poverty statistics. This means that, for instance, the headcount ratio is the percentage of people (not households) who are identified as multidimensionally poor.

2.5 Dimensions, indicators, indicator cut-offs and weights

Justification of selected dimensions of poverty measurement

Globally, the MPI uses ten indicators coming from three dimensions: education, health and living standards. The ten indicators are two for health, two for education and six for living standards. These indicators were selected after a thorough consultation process involving experts in all three dimensions. During this process, the ideal set of indicators had to be reconciled with the data that are available and are appropriate for cross-country comparison. The intrinsic and instrumental values of these indicators are presented in Alkire and Santos (2010).

The selection of the dimensions for the Ghana multidimensional poverty measure is guided by the Sustainable Development Goals (SDGs) and national development plans with some restrictions due to data availability. In general, the MPI indicators are related or identical to the SDG indictors. Therefore, the selected deprivation cut-offs for each indicator are backed by international consensus as they follow the SDG indicators as closely as data permits. Table 2.1 summarizes the dimensions, indicators, cutoffs, and

weights used in the MPI. Ten of the thirteen indicators are connected to SDG indicators. The other three provide some indication of Ghana's development plans.

In the following, detailed explanation is provided for the four dimensions and the thirteen indicators for the MPI:

Education

Education has been identified as the most important tool in providing people with the basic knowledge, skills, and the competencies to improve their quality of life at all levels of development (GSS 2007).

Under the education dimension, three indicators that complement each other are used: number of completed years of schooling of household members, school lag and the other assesses whether children are attending school. Years of schooling acts as a proxy for the level of knowledge and understanding of household members. Even though both years of schooling and school attendance are imperfect proxies, as they do not capture the quality of schooling and the level of knowledge attained or skills, yet both are robust indicators, which are widely available. The two indicators of household education provide the closest feasible approximation to levels of education for household members. The third indicator, school lag variable captures pupils who are two or more years behind the grade they should be in, based on their age.

In terms of deprivation cut-offs for this dimension, the MPI requires that at least one person in the household has completed at least nine years of schooling and that all children of school age are attending primary school or have completed primary education and are progressing steadily.

It is important to note that because of the nature of the MPI indicators, someone living in a household where there is at least one member with nine years of schooling is considered non-deprived, even though she may not be educated. Analogously, someone living in a household where there is at least one child not attending school or is two years behind is considered deprived in these indicators, even though she may have completed schooling. Households with no school-aged children are considered non-deprived in this indicator. Hence the incidence of deprivation in this indicator will reflect the demographic structure of the household and country, as well as the educational attainments.

Health

The health status of people determines their quality of life, level of productivity and longevity, and this is directly linked to the general state of development of a country (GSS 2007). Two health indicators: nutrition and child mortality are used for the health

dimension globally. However, the 2021 PHC did not collect information on nutrition. In its place, the mortality indicator is used in addition to health insurance.

The first indicator uses data on death of any child under 5 years or maternal mortality in the household. Most, although not all, child deaths are preventable, being caused by infectious disease or diarrhoea. Child malnutrition also contributes to child death. In the MPI all household members are deprived if there has been at least one observed child death (under 5 years) in the household during the past 12 months preceding the 2021 PHC. Maternal mortality on the other hand, considers a household as deprived if there is at least one female aged 12-54 years who died pregnant, during delivery or within 6 weeks after the end of a pregnancy or childbirth in the past 12 months.

The second indicator, health insurance uses data on health insurance coverage. A household suffers in bearing the medical bills if a single member is not covered. Studies revealed that, ill or injured people are not consulting a doctor as in previous years and since 2005, there has been a continual decline in those who consulted a chemist or pharmacist (GSS, 2018). The foregoing justifies the essence of the 'affordability factor' and the implementation of a national health insurance scheme which ensures that people can access minimum health care services despite their economic background. Hence, the health insurance indicator is currently a critical measure of multidimensional poverty in Ghana. A household is considered deprived if anyone in the household is not covered by the national health insurance scheme.

Living standards

The standard of living dimension uses seven indicators, four of which are standard SDG indicators with three of them relating to health and living standards, and which particularly affect women: clean drinking water, improved sanitation, and the use of clean cooking fuel. The fourth being access to electricity. The justification for these indicators is adequately presented in the SDG literature. It also includes three non-SDG indicators: housing, household assets and overcrowding.

The housing indicator is included in the MPI because it reflects an important dimension of housing quality, health, well-being, and economic conditions. It provides insights into the living conditions of individuals and households and can help policymakers identify areas where interventions are needed to improve housing quality and reduce multidimensional poverty.

On household assets, Alkire and Santos (2010) defines these to include radio, television, telephone, bicycle, motorbike, car, truck, and refrigerator. Households are classified as poor if they do not own more than one of these assets (i.e., radio, television, telephone, bicycle, motorbike, car, truck and refrigerator). The 2021 PHC has enough information on household assets such as radio, television, bicycle, motorbike, car, truck and refrigerator.

The study also used a key UN-Habitat measure or definition of adequate housing indicator, overcrowding. Per the UN-Habitat internationally accepted definition, overcrowding is defined as more than three persons per room (UN-Habitat 2009, p. 9). Overcrowding measured by the number of household members per room is a good indicator of the adequacy of the basic human need for shelter. Adequacy of room and sleeping place is often associated with certain categories of health risks and provides rudimentary indication of the quality of housing and general standard of living of a household (UN-Habitat 2009).

Wage employment

This indicator considered engagement in wage employment as it provides the key linkage between economic development and poverty reduction and is one of the vehicles for reducing poverty (ILO, 2012). Target 8.5 of SDG 8 aims to achieve full and productive employment and decent work for all women and men by 2030. A household is considered deprived if no member 15 years and older in the household is employed.

Employment data, such as labour force participation and employment status, are commonly collected in censuses, making it a practical and widely available indicator for inclusion in the MPI. The inclusion of an employment indicator in the MPI is key because it reflects a fundamental dimension of economic well-being, income generation, access to basic services, and overall quality of life. It complements other indicators in the MPI and provides a more comprehensive understanding of multidimensional poverty, allowing policymakers to design targeted interventions to improve employment opportunities and reduce poverty effectively.

TABLE 2. 1: GHANA'S NATIONAL MPI – INDICATORS, DEPRIVATION CUT-OFFS AND WEIGHTS

Dimension	Indicator	Deprivation cut-off definition	Indicator Weights	Dimension Weight
Living Standards	Cooking fuel	Deprived if household uses solid fuels and cooking is not done outside the house or in the open/ or cooking is undertaken in enclosed spaces	1/28	1/4
	Water	Deprived if a household's drinking water is from an unclean source (tanker supply/vendor provided; unprotected well; unprotected spring; river/stream; dugout/pond/lake/dam/canal; other) or a round trip distance to collect water takes 30 minutes or more	1/28	
	Assets	Deprived if household does not have more than one small asset (radio, TV, telephone, bike, motorbike, refrigerator, or computer) and does not own a car	1/28	

	Housing	Deprived if household uses inadequate flooring (earth/mud, other) or walls (earth/mud, palm leaves/thatch (grass/raffia), other)	1/28	
	Overcrowding	Deprived if household has more than 3 people per sleeping room, on average	1/28	
	Electricity	Deprived if household does not have electric power	1/28	
	Toilet	Deprived if household has no toilet facilities, uses bucket/pan, public toilet, shared toilet outside the house, other	1/28	
Education	School attendance	Deprived if any school-age child (4-15years) in the household is not attending school	1/12	1/4
	School attainment	Deprived if no household member has received an at least 9 years of schooling	1/12	
	School lag	Deprived if household has any member who is 2 or more years behind in school	1/12	
Health	Mortality	A household is deprived if either a child (<5 years) or a pregnant mother died in the household	1/8	1/4
	Health insurance	Deprived if anyone in the household is not covered by the national health insurance scheme	1/8	
Wage Employment	Employment	Deprived if no member 15 years and older in the household is employed	1/4	1/4

2.6 Weights

The weighting system adopted for Ghana's MPI is the 'nested weights' approach, implying that each of the four dimensions is equally weighted—a quarter of the total weight is assigned to living standards, education, health, and employment—and each component indicator is equally weighted within its dimension. For each dimension, there is a possible variation in the number of indicators. Subsequently, indicators in the living standards indicators are given a weight of 1/28, each education indicator has a weight of 1/12, health dimension receive a weight of 1/8, and employment dimension and indicator received 1/4 each. Overall, the weights add up to 100 percent. The deprivation score is the sum of the weights of the indicators in which the person is deprived and shows the percentage of total possible deprivations that the person experiences.

2.7 Poverty cut-off (k)

For Ghana's MPI the cut-off is specified at one-third of the indicators; that is, a person whose deprivation constitute at least 33.3 percent of the weighted indicators is identified as multidimensionally poor. The chosen cut-off reflects the global MPI, which suggests that a person must be deprived in at least one full dimension's worth of indicators to be considered multidimensionally poor. A person deprived in 20-33.3 percent of the

weighted indicators is considered 'vulnerable to poverty' and a person deprived in at least 50 percent of the weighted indicators is identified as being in severe poverty.

2.8 Data description

This report draws on the household population data from the 2021 Population and Housing Census (2021 PHC). In the 2021 PHC, 27th June 2021 was designated as the Census Night (the reference point to which all enumeration questions relate), with activities organised in all the 272 Statistical Districts to usher in the enumeration. Enumeration involved a face-to-face collection of information by Field Officers using different sets of instruments to cover different population groups and housing units throughout the country. On the Census Night, information was collected on all homeless households, people in transit (long-distance travellers), institutions (boarding), outdoor sleepers, hotels, guest houses and other lodging places, police cells, hospitals (in-patients) with the household and institutional enumeration beginning the following day. The 14-day period for the enumeration started on the 28th of June and ended on 11th July 2021. Subsequently, a mop-up exercise was conducted for one week and up to three weeks in selected areas to ensure the complete coverage.