MONETARY AND NON-MONETARY POVERTY MEASURES FROM A LIVING INCOME PERSPECTIVE

Author: Johannes von Engelhardt
Contributors: Molly Leavens, Stephanie Daniels

Photo: ©2019 CIAT/Georgina Smith

Date: September, 2023

Prepared for: The Living Income Community of Practice

www.living-income.com

Table of Contents

About the Authors

Johannes von Engelhardt

Johannes von Engelhardt, Ph.D., is an independent researcher and evaluation consultant working on M&E and research assignments in different parts of the Global South, with a focus on Sub-Saharan Africa. He also teaches statistics and research methods at the University of Amsterdam (PPLE College).

Molly Leavens

Molly Leavens is a Program Manager at the Sustainable Food Lab, where she partners with multinational food companies, NGOs, and governmental agencies to improve smallholder farmer income, livelihoods, and climate resiliency.

Stephanie Daniels

Stephanie Daniels is a Senior Program Director at the Sustainable Food Lab, where she manages the impact and learning partnerships focused on living income. Her expertise is in responsible sourcing from smallholders in developing countries, with a focus on cocoa.

GLOSSARY

Anker methodology	A robust and widely accepted methodology for developing Living Wage benchmarks and assessing the gap with actual wages. The Anker methodology can also be used for developing Living Income benchmarks, as both Living Wage and Living Income benchmarks are based on the cost of a basic but decent standard of living for a family.
Basic but decent standard of living	A basic but decent standard of living means being able to afford a low-cost and nutritious diet, basic healthy housing, and other essential expenses, including adequate healthcare and education of children through secondary school, and not being at risk of poverty or unaffordable debt due to occasional or unplanned events (marriages, funerals, illnesses, etc.).
DHS Wealth Index	The Demographic and Health Surveys Program (DHS) Wealth Index assesses a household's relative socioeconomic position by looking at ownership of assets and access to amenities (e.g., clean and safe drinking water). Rather than considering what someone *earns* (monetary approach), or how poverty is *manifested* in their daily live (multidimensional approach), the DHS Wealth Index focuses exclusively on what people *own*.
Living income	The net annual income required for a family in a particular place to afford a decent standard of living for all members of that family. Elements of a decent standard of living include: food, water, housing, education, healthcare, transport, clothing, and other essential needs including provision for unexpected events.
MPI	The Multidimensional Poverty Index (MPI), is a measure of non-monetary poverty that considers concrete manifestations of poverty that people face in their everyday lives, called deprivations. The MPI focuses on deprivations in the areas of education, health and living conditions. Households that face a certain number of deprivations are categorized as multidimensionally poor.
Net annual family income	The total amount of income earned by family members over the course of a year – including cash and non-cash income (e.g. food produced by family members for their own consumption) – minus the costs associated with earning that income. It includes income from all sources, including remittances and social protection transfers.
PPI	The Poverty Probability Index (PPI®) is a methodology of estimating the probability of a household living in monetary poverty. The index uses a list of ten simple yes/no questions that can be answered by any adult member of the household. Based on the response to these questions, a probability is estimated that the surveyed household lives below a given poverty line.

INTRODUCTION

This paper compares the methodology, both conceptually and operationally, of a living income gap assessment (i.e., the measure of how actual income of a household compares to a living income benchmark), to well-known poverty measures based on evaluation of non-monetary factors, such as physical assets and access to social services. This comparison will enable organizations working on living income to additionally consider the multiple dimensions of wealth and poverty that impact people's standard of living and resilience to shocks.

At the end of each section, further readings and resources are offered to the reader. See the summary slides that accompany this paper here.

Paper purpose

This paper is meant as a starting point for a discussion among LICOP partners on the added value of complementing a living income approach with other perspectives on welfare that are not (exclusively) monetary. It offers an introduction to some of these alternative perspectives on poverty – specially, the Multidimensional Poverty Index, the DLH Wealth Index, and the Progress out of Poverty Index – including practical implementation and thoughts on how they might complement and enrich the living income perspective.

LICOP has advanced considerably in its effort to bring together agricultural sectors to align on the core definition of living income, and the approaches to compare actual incomes to a living income benchmark. Numerous organizations, companies and private public initiatives are underway with living income as a goal, a key performance indicator, and/or a framework for supply chain engagement. However, we know that achieving a living income (as currently defined by the Anker methodology) is only a steppingstone towards economic resilience of smallholder farmers and not an indicator of broader prosperity. Even before the COVID-19 pandemic and the current cost-of-living crisis are accounted for, data from UNDP showed that 1.2 billion people in 111 developing countries lived in acute multidimensional poverty. This is nearly double the number who are seen as poor when poverty is defined using a traditional monetary target such as the World Bank's $1.90 per day. This simple comparison suggests that although income-based measures are necessary for understanding the economic situation of a family or individual, looking at assets and access to services (and lack thereof) are important when we want to understand and measure material well-being and social exclusion. Methodologies to provide this broader picture of poverty – that consider multiple dimensions of wellbeing beyond monetary poverty – are being used globally, and LICOP would like to start exploring the links and complementarity between monetary based measure and the living income approach.

Living income concept

Living income and living wage benchmarks establish normative thresholds of decency for the critical aspects of wellbeing (e.g., food, housing, education, and a margin for savings) in order to calculate the costs of affording these aspects of a decent standard of living. They are not a measure of poverty or wealth but rather a measure of the cost of a decent standard of living. This cost estimate, established in the Anker methodology, allows for governments, companies, workers unions, civil society, and farmers to compare these costs with prevailing wages and incomes to understand the gaps.

A 'living income gap assessment' assess the gap between actual incomes and a living income benchmark. It is this combined approach – of measuring the revenues and costs of a household's income then comparing it to a local benchmark – that is best compared to the multidimensional or asset-based measures that evaluate a household's situation against a defined threshold. This paper will use the term 'living income gap

assessment' with recognition that there is a range of methods to measure actual incomes, from proxy calculations to in-depth, survey-based household economic analyses.

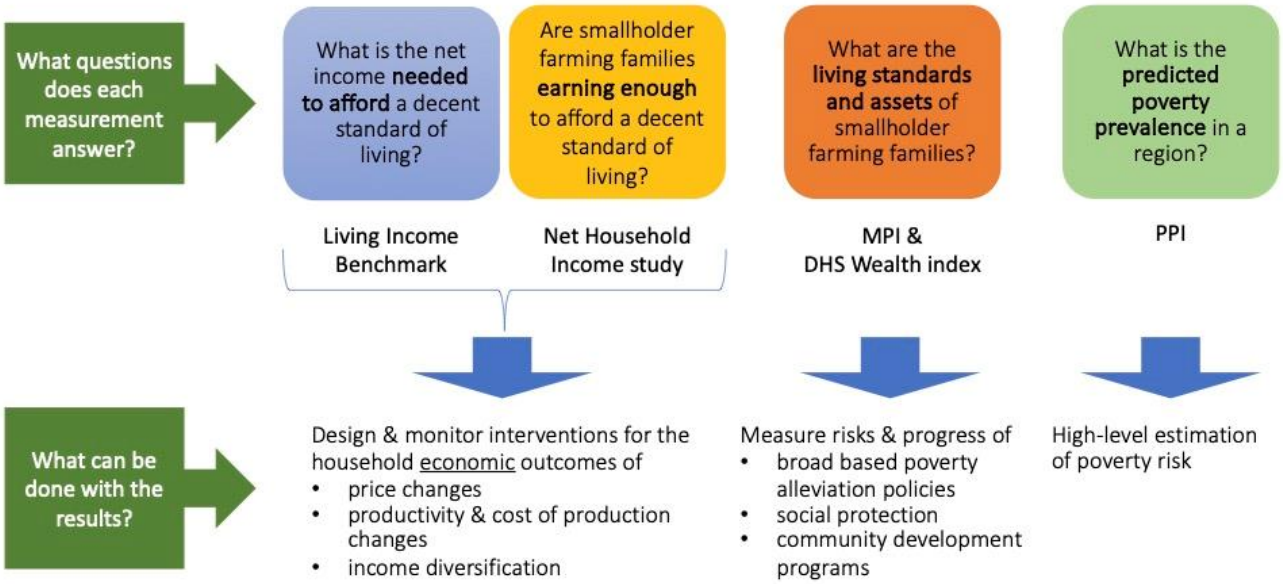
The concept of living income most commonly refers to independent farmers, and it is typically used to assess the conditions in a commercial supply chain or market to assess whether employers or buyers are providing the remuneration and investment needed to enable a farming family to earn enough to reach or exceed the living income benchmark. The concept does not measure what the family does with their earnings nor whether they have access to quality food, housing, education, or health care. Consequently, other types of poverty measures could offer considerable value in situations where both the market and the livelihoods status of farming families are being assessed.

Why living income

The living income concept can be helpful to assess the economic situation (and the associated risks) of any supply chain. Most critically, the living income and living wage concepts, as opposed to other poverty measures, allow a robust and quantifiable discussion on prices and wages paid between market actors. Prices and wages are typically obscured in the dialogue on sustainability programs or markets when measures of sustainable livelihoods, for example, are used. As opposed to the challenges of determining whether the price of a commodity (e.g., coffee) could enable families to have a sustainable livelihood, it is a straightforward measure to assess whether the farming families could make a living income or are receiving a living wage.

This paper does not argue for the application of one poverty measure over another. Rather, it outlines the differing use cases between measures.

Graphic 1: Differing use cases for monetary and non-monetary measures



THE MULTIDIMENSIONAL POVERTY INDEX

A non-monetary approach to poverty

The Multidimensional Poverty Index (MPI) was developed in 2010 by the Oxford Poverty and Human Development Initiative at Oxford University in cooperation with the United Nations Development Programme (UNDP). Since its inception, the index has become one of the best known and most widely used non-monetary poverty measures and features prominently in UNDP's annual flagship publication, the *Human Development Report*.

The MPI comes out of a tradition of scholars and practitioners who challenge the notion that wellbeing and poverty can be adequately understood by looking at income alone.[1] Instead, the multidimensional approach directs our attention to concrete manifestations of poverty that people face in their everyday lives. In multidimensional terminology, these are called 'deprivations'. The MPI focuses on deprivations in the areas of education, health and living conditions. Households that face a certain number of deprivations are categorized as multidimensionally poor (see below for details on MPI method).

By taking deprivations as its vantage point, the MPI aims to assess whether households are capable of fulfilling a set of basic human needs. This deprivation-focused approach thus employs a much lower threshold than the living income perspective, which is concerned with whether a household's income would be enough to live a *decent* life.

In addition, the proponents of multidimensional approaches such as the MPI challenge the assumption that a given increase in income can always result in a certain decrease in deprivations that people face. For example, it is undisputed that access to education is essential to human welfare and that families living in (extreme) poverty oftentimes find themselves unable to send their children to school. If only considering monetary wealth, an increase in household income is assumed to eventually do away with the various manifestations of poverty, including this one. In fact, the calculation of many income-based threshold values – like the Anker method for calculating living income benchmarks – include estimations of the (average) cost of sending a household's children to school.

In practice, however, household income might be only one of the obstacles to education. For example, the current security situation can make it impossible for children to reach their school safely; the absence of a functioning school in the area might mean that access to education is simply not available to the children in the community; and existing cultural norms may prevent girls from attending schools.

None of these barriers to education can be overcome by a household through (modest) increases in income. For the MPI, however, all of the above scenarios would be considered deprivations of access to education. Analogous arguments can be made for other public goods such as health care, clean drinking water or electricity.

On an individual level, the MPI's emphasis on lived manifestations of poverty also takes into account the fact that the amount of money required to overcome a set of given deprivations will vary considerably from person to person, as a function of different individual and contextual factors. Issues such as health problems, physical disabilities, climate factors, and ethnic or class discrimination can substantially affect the amount

[1] While the MPI popularized the multidimensional approach to poverty assessment, the idea that poverty should not be seen as purely monetary had not been a new one. Most notably, UNDP's multidimensional Human Development Index (HDI) was developed already in 1990. In contrast to the MPI, however, the HDI is an aggregate measure that is calculated on country level.

of income that is needed to live a decent life. For those arguing for a multidimensional approach, an exclusive focus on income is thus seen as insufficient when trying to accurately understand and assess welfare and poverty in a given community.

A Framework, not a Fixed Instrument

The MPI instrument described here is the global MPI. While the global MPI has established itself as a useful and internationally comparable measure of multidimensional poverty, its creators explicitly encourage users to rework the index to fit their specific purpose. This might mean adding dimensions or indicators, while adapting or dropping others. One example of this is the World Bank's Multidimensional Poverty Measure that is discussed below. It is for this reason that the MPI approach should be understood more as a methodological framework than a fixed instrument.

In fact, several countries in the Global South have started to develop national versions of the MPI to report on multidimensional poverty alongside monetary statistics.[1] For example, the Ugandan national MPI comprises seven of the ten indicators discussed below, but also includes deprivations such as child labour, lacking access to health care, and inadequate size of dwelling (three or more people per room). Based on this conceptualization of multidimensional poverty, the Uganda Bureau of Statistics estimates the national 2022 MPI headcount ratio to be 42.1%.[2]

Another illustrative example of how the MPI methodology has been used to construct context-specific indicators of multidimensional poverty is the Rural Multidimensional Poverty Index (R-MPI), developed by The Food and Agriculture Organization of the United Nations in cooperation with the Oxford Poverty and Human Development Initiative. The R-MPI was created in response to concerns that the global MPI fails to adequately capture the realities of rural poverty. Specifically, the index accounts for the fact that low-income households in rural areas differ from their urban counterparts with respect to their source of livelihood, the resources they require to stay out of poverty and the risks they face. The R-MPI consists of five dimensions comprising a total of 18 deprivations, some of which are specific to poverty in rural settings. These include deprivations such as lacking agricultural assets, lacking access to extension services, and vulnerability to climate shocks.[3]

Measuring the MPI

As mentioned above, the MPI considers a household's deprivations in three life domains, or dimensions: heath, education and living standard. Measuring the MPI within a given sample requires data about ten binary indicators, each falling into one of these three dimensions (see *Table 1*). While some of these indicators rely on only a single question (e.g., type of cooking fuel used), others draw on a series of questions in the questionnaire (e.g., construction materials).

In practice, a 'minimal' questionnaire to measure the MPI consists of:

- a household roster, gathering information about each household member's age, number of years of schooling completed and whether they currently attend school (for school-aged children)

[2] The full report can be found on the website of the Ugandan Bureau of Statistics: www.ubos.org

[3] Detailed documentation of the R-MPI methodology and findings can be found on the FAO website: https://www.fao.org/documents/card/en/c/cb8269en/

- seven multiple-choice questions on construction materials of the household dwelling, type of cooking fuel and access to water and sanitation; a question on how long it takes to fetch drinking water; a list of twelve assets from which to select those currently owned by the household
- and a module to measure height and weight of each household member, to assess undernourishment (by calculating the Body Mass Index).

Based on their responses, households are either considered 'deprived' or 'not deprived' on each of the ten indicators. The total number of deprivations determines whether a household is considered MPI poor or not. For this, indicators first need to be weighted. This step is necessary as the three dimensions are considered equally important for contributing to multidimensional poverty, but the number of indicators per dimension differ (see Table 1). Once indicators have been weighted, they are summed to calculate a household's deprivation score. A household is considered MPI poor if its deprivation score is 0.33 or higher – i.e., if its members face deprivations on at least one third of the weighted indicators.[4]

To get a more intuitive sense of what this means in practice, consider a household without adequate access to clean drinking water and with at least one school-aged child not attending school. Assuming this household is not deprived on any other MPI indicator, it would not be considered MPI-poor, as the weighted sum of its deprivations is 1/6 + 1/18 = 0.22. However, if the dwelling of this household is constructed out of rudimentary materials such as dried mud, the deprivation score would reach the critical threshold of 0.33. The same household would then be categorized as MPI-poor.

After households have been identified as MPI poor or nonpoor, a number of summary measures are typically computed to describe the prevalence and intensity of MPI poverty in the sample.

Firstly, and most evidently, the proportion of the MPI poor in the sample is calculated. This summary figure represents the *incidence* of MPI poverty. It is equivalent to the monetary-based *headcount ratios* of those above a given poverty line / living income benchmark.

The second summary measure that can be computed using MPI data expresses the *intensity*, or depth, of MPI poverty in the sample. For this purpose, the average number of weighted deprivations faced by the MPI poor is calculated. The measure thus quantifies the discrepancy between the current situation and an acceptable welfare level of the target community. In that sense, the depth of MPI poverty is similar to the living income gap for those living below the local living income benchmark. For this comparison, however, it is important to remember that the bar of the MPI (not being deprived of basic human needs) lies considerably lower than that of the living income approach (enjoying a decent standard of living).

Lastly, the MPI methodology allows for the construction of a single summary figure that carries information of both *incidence* and *intensity* of MPI poverty. This so call 'adjusted poverty headcount ratio', is calculated by multiplying the percentage of those who are MPI-poor (incidence) by the average weighted deprivations experienced by that group (intensity). While this summary statistic is certainly the least intuitive of the three, it carries the advantage of registering differences – either across groups or time – both in incidence and intensity of MPI poverty simultaneously. No common equivalent exists within the living income approach. However, as one of the primary purposes of living income measurement is to offer buyers precise targets for pricing and wages, an unintuitive summary figure would not serve the intended purpose of living income measurement.

[4] In addition to this binary classification of poor / non-poor, the MPI methodology describes two additional categories: vulnerable to MPI poverty (between 0.2 and 0.33) and severely MPI poor (above 0.5).

Table 1: MPI dimensions and indicators

Dimension	*Indicator*	*Deprived if…*	*Weight*	*SDG area*
Health (1/3)	*Nutrition*	*Any person under 70 years of age for whom there is nutritional information is **undernourished**.*	*1/6*	*SDG 2: Zero Hunger*
	Child mortality	*A child **under 18** has **died** in the household in the five-year period preceding the survey.*	*1/6*	*SDG 3: Health and Well-being*
Education (1/3)	*Years of schooling*	*__No__ eligible household member has completed **six years of schooling**.*	*1/6*	*SDG 4: Quality Education*
	School attendance	*Any school-aged child is **not attending** school **up to** the age at which he/she would complete **class 8**.*	*1/6*	*SDG 4: Quality Education*
Living Standards (1/3)	*Cooking fuel*	*A household cooks using **solid fuel**, such as dung, agricultural crop, shrubs, wood, charcoal, or coal.*	*1/18*	*SDG 7: Affordable and Clean Energy*
	Sanitation	*The household has **unimproved** or **no** sanitation **facility** or it is improved but **shared** with other households.*	*1/18*	*SDG 6: Clean Water and Sanitation*
	Drinking water	*The household's source of **drinking water** is **not safe** or safe drinking water is a **30-minute** or **longer walk** from home, roundtrip.*	*1/18*	*SDG 6: Clean Water and Sanitation*
	Electricity	*The household has **no electricity**.*	*1/18*	*SDG 7: Affordable and Clean Energy*
	Housing	*The household has **inadequate** housing materials in **any** of the three components: **floor**, **roof**, or **walls**.*	*1/18*	*SDG 11: Sustainable Cities and Communities*
	Assets	*The household does **not own more than one** of these **assets**: radio, TV, telephone, computer, animal cart, bicycle, motorbike, or refrigerator, and does not own a car or truck.*	*1/18*	*SDG 1: No Poverty*

Source: Alkire, S., Kanagaratnam, U. and Suppa, N. (2020). 'The global Multidimensional Poverty Index (MPI): 2020 revision', OPHI MPI Methodological Note 49, Oxford Poverty and Human Development Initiative, University of Oxford.

Tony's Chocolonely: an MPI user story

Tony's Chocolonely is a Dutch Fair Trade certified chocolate brand. The company sources its cocoa beans from Ghana and Côte d'Ivoire, following a set of ethical and sustainable principles. These include long-term contracts with producer coops and paying a Living Income Reference Price.

In 2019, Tony's Chocolonely started conducting annual MPI assessments in all of its partner coops. Since then, the company's impact team has been using MPI findings to monitor changes in the wellbeing of farmers across time and to examine differences between coops in deprivations and MPI headcount ratios.[5]

Pavithra Ram – the company's 'Impact Navigator' – explains that the role of the MPI for the company's mission has evolved across time: "We initially introduced the MPI as our main instrument to measure the impact of our sourcing principles on the living conditions in our partner coops." Since then, the company has increased their efforts to also gather more detailed information about farmers' financial situations to allow for living income analyses.

Ram explains how Tony's Chocolonely now uses data on living income and the MPI in unison: "While our main impact goal has now shifted to reducing the living income gap, the insights we get from the MPI analyses remain immensely valuable. Poverty is not just a matter of income. Without an enabling environment where families have access to basic services, the real-life effects of earning a living income will actually be limited. The MPI helps us to see the bigger picture. But this is of course not a one-way street. Each year, we look at the coop-level findings together with coop representatives to better understand the various challenges faced by their farmers and to discuss what would be needed to address them."

MPI and living income

Adding a MPI measurement to an existing living income framework can help to develop a fuller understanding of welfare and poverty in a target community. Particularly, stakeholders with a stated commitment to the SDGs should consider integrating the MPI in their assessment and reporting, as its indicators relate directly to seven out of the 17 goals to be achieved by 2030.[6] Living income has clear links to four of the SDGs.[7]

At the same time, it is important to appreciate that the MPI is not a suitable instrument to *validate* living income data, as it is explicitly not a proxy of monetary wellbeing (in contrast to the PPI, see section 5). The potential added value of the MPI lies in complementing and enriching existing monetary-based welfare assessments.

[5] See https://tonyschocolonely.com/int/en/our-story/news/unwrapping-the-true-cost-of-poverty
In Tony's MPI assessment, the BMI-based nutrition indicator is replaced by a standardized survey instrument to measure food insecurity (HFIAS scale). This decision is driven by the considerable logistical efforts required to accurately measure height and weight of each household member during a single field visit. A similar strategy is followed by the Rural Multidimensional Poverty Index (see box above).

[6] In fact, a number of 2018 revisions to some of its indicators aligned the MPI more closely with the SDGs, so that its findings speak more directly to current debates on global poverty.

[7] https://www.living-income.com/sdg-s-and-living-income

This also means that empirical results of monetary and multidimensional assessments will only partially coincide, as it is quite possible for a household that lives above a monetary threshold such as a living income benchmark to be classified as multidimensionally poor, and vice versa.

A recent survey-based study explored in some detail the extent of this overlap for the case of Rwanda. Using 2013/2014 household surveys, the researchers found that no more than 60.4% of those classified as monetary poor were also considered multidimensionally poor. Conversely, out of the MPI-poor households, 51.7% were also categorized as poor in a monetary sense. While these figures will vary considerably from context to context and for different monetary benchmarks, they illustrate that monetary poor and multidimensionally poor households should be seen as two distinct, albeit overlapping, groups.

A large-scale 2018 study by the Dutch Royal Tropic Institute offers additional insight into the relationship between multidimensional poverty and living income among cocoa farmers in Ghana and Côte d'Ivoire.[8] While the authors do not calculate the actual MPI, most of its ten indicators were included in the questionnaire. As the report of the study shows, a number of these indicators – such as building materials and access to electricity – vary in the predicted manner between farmers below and above the living income benchmark.

As we have seen above, the MPI methodology allows for the calculation of summary figures of incidence and intensity. These aggregate statistics can be used to monitor progress or to identify and target the most vulnerable in a community. Since country-level MPI figures are available for most of the countries in the Global South,[9] the level of welfare in a specific community can also be compared to national averages. This is similar to using living income aggregate statistics to compare between groups or across time. However, within the living income approach, comparisons to the overall country are currently hindered by the absence of country-level living income gap estimates.

The MPI also allows the user to disaggregate results to better understand the specific deprivations faced by those living in poverty. This can help to shed light on community-specific clusters of deprivations and their relationship to known living income figures. For example, MPI data from two communities with similar living income gaps might reveal meaningful differences in the lived experiences of poverty: citizens in the one could be facing deprivations mostly in the areas of education and health, while those in the other might suffer more acutely from lacking public services and asset poverty. Such disaggregated MPI results can then also be used to measure the impact that projects or living income initiates have on people's everyday lives.

[8] https://www.kit.nl/project/demystifying-cocoa-sector/

[9] See https://ophi.org.uk/multidimensional-poverty-index/mpi-country-briefings/

The World Banks' Multidimensional Poverty Measure

In 2018, the World Bank presented its own multidimensional approach to poverty, the Multidimensional Poverty Measure (MPM). Since then, the measure has featured prominently in the World Bank's bi-annual Poverty Shared Prosperity reports on global developments in (multidimensional) poverty.

Methodologically, the MPM is modelled closely on the MPI, also measuring poverty through the sum of specific deprivations that a household might face. Just like the MPI, it considers deprivations in access to education, safe drinking water, adequate sanitation and electricity (the last three grouped under the dimension 'infrastructure'). In contrast to the MPI, the MPM does not include deprivations in assets, housing materials, cooking fuel, child mortality and nutrition.

The most substantial discrepancy between the two measures is that the MPM integrates monetary poverty as one of the three dimensions of the measure. Households that live below the international poverty line of $2.15/p/day are considered deprived on monetary poverty, and thus multidimensionally poor. By doing so, the MPM acknowledges that poverty is inherently multidimensional, while not giving up on the premise that it should be measured, at least partially, by looking at household income.

Global MPM results are reported bi-annually in the World Bank's NAMETK reports and are presented visually on an interactive website.[10] However, since calculating the MPM requires household-level data on income or expenditure, which is costly to collect, it is not widely used outside of the World Bank.

Selected MPI resources

Oxford Poverty and Human Development Initiative Website. Available at https://ophi.org.uk

Salecker, L., Ahmadov, A.K. & Karimli, L. (2020). **Contrasting Monetary and Multidimensional Poverty Measures in a Low-Income Sub-Saharan African Country.** Social Indicators Research (151). Available at https://doi.org/10.1007/s11205-020-02382-z

Evans, M. Nogales, R. and Robson, M. (2020). **Monetary and multidimensional poverty: Correlations, mismatches, and joint distributions** (OPHI Working Paper 133). Available at https://ophi.org.uk/wp133/

FAO and OPHI (2022) **Measuring rural poverty with a multidimensional approach: The Rural Multidimensional Poverty Index.** FAO Statistical Development Series (19). Available at *https://doi.org/10.4060/cb8269en*

[10] https://www.worldbank.org/en/topic/poverty/brief/multidimensional-poverty-measure

THE DHS WEALTH INDEX

Poverty as material scarcity

The DHS Wealth Index was first introduced in the late 1990s as an alternative to monetary-based poverty assessments in the Global South. Originally, the index was developed by researchers interested in the relationship between poverty and health measures, in situations where no income data was available. The index is now widely used by academics, NGOs and other practitioners.

The basic idea behind the DSH Wealth Index and related indices is that a household's relative socioeconomic position can be determined reliably by asking about assets (e.g., a radio or fridge) and amenities (e.g., clean and safe drinking water). Rather than considering what someone *earns* (monetary approach), or how poverty is *manifested* in their daily live (multidimensional approach), the DHS Wealth Index thus focuses exclusively at what people *own*.

The construction of the DHS Wealth Index considers a limited set of assets and amenities to distinguish between different levels of material wealth. To illustrate, Table 2 lists the items currently used for constructing the DHS Wealth Index for Ghana.[11]

Table 2: DHS Wealth Index items for Ghana

source of drinking water	television	refrigerator	animal-drawn cart
type of toilet facility	telephone (non-mobile)	freezer	car, bus or truck
type of cooking fuel	camera	generator	boat with a motor
electricity	video/dvd/vcd	washing machine	boat without a motor
material of floor	sewing machine	cabinet	bank account
material of roof	bed	wrist watch	number of household members per bedroom
material of wall	table	mobile telephone	
land	chair	bicycle	
radio	computer	motorcycle or scooter	

Before taking a closer look at the construction of the index and its relationship to living income, it is useful to point to two defining characteristics that distinguish it from both the monetary and multidimensional approaches to poverty discussed elsewhere in this paper.

First, the DHS Wealth Index is a measure of *relative* wealth. As its methodology is not based on normative prescriptions about 'decent' or 'minimally acceptable' levels of material wealth, no statements can be made about the proportion of households living below/above a specific wealth threshold. As we will see below, a

[11] While most of the items on this list are universal, the DHS methodology allows for the inclusion of country-specific items.

DHS Wealth Index assessment instead enables the user to make meaningful comparisons across time, across groups, as well as within a country's population as a whole.

Second, rather than a measure of a household's current economic situation, the index is a measure of a household's *cumulative* living standard. Asset ownership in the Global South is known to be considerably more stable across time than income or consumption levels. As a consequence, any asset-based index is considerably less responsive to short- or mid-term fluctuations of a household's economic situation. This is also true for shocks that can have dramatic impacts on people's lives such as crop failure, natural disaster or illness. If such events register at all on the DHS Wealth Index, they will do so with substantial delays, and only in situations where households are unable to recover and are eventually forced into selling assets in order to meet their subsistence needs. While the index is thus a considerably stable – and thus reliable – measure of a household's longer-term economic wellbeing, it also carries the risk of obscuring real and impactful changes in people's living standards.

Measuring the DHS Wealth Index

Surveys to gather the household-level data needed to calculate the DHS Wealth Index are relatively straightforward and typically take under 30 minutes to complete. This is considerably shorter than the 1-1.5 hours that are typically needed for a full household income survey, which is most often required for living income gap assessments.

Since all the questions of the index are about concrete and material aspects of a household's current living condition, the DHS survey is much less prone to the various systematic and random measurement errors that are common in income or expenditure interviews. For most of the survey items, the respondent is simply asked to indicate whether the household owns a given asset or has access to a given amenity. For other questions – e.g., source of drinking water or type of construction materials – a list of predefined options is given.

After data collection, a relative wealth score is calculated for each household. Notably, and maybe surprisingly, this is achieved without assigning monetary values to each of the items in the questionnaire. Instead, the DHS publishes the relative weights of each asset and amenity per country on its website.[12] For example, while ownership of a television set and of a motorized four-wheeled vehicle are both considered meaningful indicators of wealth, the latter contributes substantially more to a household's overall wealth score. In the case of Ghana (see Table 2), the weight of owning a motorized vehicle is therefore more than twice of that of owning a television set.

Once households have been indexed based on their responses, they can be placed into one of five country-level wealth quintile groups. This allows for comparisons of wealth distributions between groups, as well as across time. In addition, since the index defines quintile cut-off values on a national level, it enables comparison between the level of material wealth in any given group and the level of material wealth

[12] Using the weight values calculated by the DHS program (rather than computing them oneself) assumes a scenario where households are to be placed into country-level quintile groups. The relative weights of assets and amenities for the DHS Wealth Index are derived through a statistical procedure call Principal Component Analysis. Underlying this technique is the assumption that a household's economic status is a latent variable that – while not measurable directly – affects the likelihood of owning specific assets and having access to specific amenities. For each asset and amenity, the statistical procedure then estimates how strongly it is correlated with this latent variable, or 'component'. This results in relative weights for each item. Applying these weights to one's data then allows for the calculation of a continuous variable that reflects a household's relative level of economic status. This process of constructing weights for the DHS Wealth Index and using them to score households according to their economic status is thus entirely data-driven and not based on assigning monetary value to assets and amenities.

nationally. For example, a given household might have been categorized into the lowest wealth quintile group, based on the information provided about its assets and amenities. This means that this household belongs to the bottom 20% of the given country in terms of material wealth.

DHS Wealth Index and living income

Similar to the MPI, the DHS Wealth Index can offer additional insights into the living situation of a target group that go beyond their income situation. As discussed above, given its relative irresponsiveness to short and mid-term fluctuations, the index is particularly useful when assessing (differences in) households' longer-term socioeconomic status. This can become acutely relevant when working in farming communities with high income seasonality. As a household's assets and amenities are less volatile than its income situation, results will be less dependent on the time of the year when data gathering takes place.

It should be clear that, just like the MPI, the DHS Wealth Index is not a measure or proxy of monetary wellbeing, and as such cannot be used to validate findings of a living income assessment. However, as a measure of cumulative living conditions, the index can help to identify those more likely to have lived below living income benchmarks for sustained periods of time. In that sense, the index can be seen as a proxy of financial resilience, helping to identify households that are particularly vulnerable to shocks.

Given the above, it will not come as a surprise that monetary poverty and material wealth assessed by the DHS Wealth Index are empirically related. Once more, findings from the previously cited 2018 KIT study of cocoa farmers in Ghana and Côte d'Ivoire offer valuable insights. Results show that, among male-headed households, those above the living income benchmark also scored higher on the DHS Wealth Index.[13] This finding was consistent and statistically significant for both typical and large households. Unfortunately, no results on the relationship between the two measures were reported for female-headed households.

Selected DHS resources

DHS Wealth Index website. Available at https://dhsprogram.com/topics/wealth-index/Wealth-Index-Construction.cfm

Foreit, K., Schreiner, M. (2011). **Comparing Alternative Measures of Poverty: Assets-Based Wealth Index vs. Expenditures-Based Poverty Score.** Available at https://www.measureevaluation.org/resources/publications/wp-11-123.html

Hackman, J. (2021). **An Agricultural Wealth Index for Multidimensional Wealth Assessments.** Population and Development Review 47(10). Available at https://onlinelibrary.wiley.com/share/9ENHFKBCBCZD8WPUYSDI?target=10.1111/padr.12367

13

THE POVERTY PROBABILITY INDEX

Predicting probabilities of monetary poverty

The Poverty Probability Index (PPI) was developed by the US-based non-profit research organization Innovations for Poverty Actions (IPA). The PPI responded to the need of organizations working in the Global South to assess and monitor monetary poverty levels in their target populations in a cost effective and simple manner.

As mentioned above, reliably determining whether a household's annual income lies above or below a given poverty line is immensely costly, time-consuming, and tedious, and many organizations lack the resources necessary to gather such primary income data. The PPI intends to address this challenge by offering a simple and low-cost method to estimate the probability that a household lives below a monetary poverty line, without having to gather data on household income.

The index consists of ten simple surveys items that any member of the house can answer. The lists of PPI questions are country-specific. For illustration purposes, Table 3 shows the PPI surveys questions for Malawi.

A first glance of this list might suggest that the PPI methodology is similar to both the MPI and the DHS Wealth Index. Like these two approaches, the PPI's ten country-specific indicators also document non-monetary, material aspects of people's everyday lives.

However, the rationale that underlies the construction of a country's PPI indicator set differs fundamentally from those of the MPI and DHS Wealth Index. The PPI neither measures specific meaningful manifestations of lived poverty (multidimensional approach) nor reliably estimates a household's level of material wealth (assets approach). Rather, IPA selects PPI indicators primarily because of their statistical properties as useful predictors of monetary poverty.

Drawing on pre-existing, nationally-representative household surveys which – among other things –include detailed assessments of household income, the researchers at IPA use statistical techniques to identify ten questions that, as a whole, can best predict whether a household lives below a certain poverty line. This process aims to find specific non-monetary household properties that, if no information about income had been available, would allow for a decent prediction of whether the household currently lives in monetary poverty.

For example, as is the case in most countries, households in Malawi that live in certain regions show, on average, substantially higher risks of monetary poverty than those living elsewhere. For that reason, the district where a household lives is one of the questions used for the Malawi PPI to estimate the risk of living below a given poverty line. Similarly, IPA's analyses of household surveys in Guatemala show that if a household head did not have a spouse or partner, the statistical probability of that household living below $2.15/p/day was higher by up to 10%. The PPI questionnaire for Guatemala therefore includes a question on the relationship status of the household head.[14]

As these two country examples show, PPI indicators are chosen primarily because of their statistical, rather their theoretical, relationship to poverty. At the same time, many of the PPI indicators used in different countries have a more intuitive relationship to poverty. For example, many PPI questionnaires include questions on building materials and access to sanitation and clean drinking water. Crucially, though, the

[14] IPA reports that besides items' correlation to monetary poverty, secondary selection criteria include the ease with which data can be collected and assumed sensitivity to changes in a household's economic situation.

choice of including or excluding a PPI indicator for any given country is based first and foremost on the strength of its correlation with monetary poverty, as opposed to whether it alone captures a meaningful aspect of poverty in that country. In contrast to both the multidimensional and the asset-based approach, whose methodologies are informed by theoretical representations of poverty, the PPI is a data-driven effort as its constituent indicators are used merely as statistical predictors of monetary poverty.[15]

Table 3: PPI survey questions Malawi

1. In which district does the household live? *[multiple options]*	**6. What is the main source of cooking fuel in your household?** o Purchased firewood, Paraffin, Electricity, Gas, Charcoal, Saw Dust o Collected firewood, Crop residue, Other
2. How many household members live in the household? o 1 or 2 o 3 to 5 o 6 or more	**7. Does your household own a bed?** o Yes o No
3. Is the household head able to read and write in English? o Yes o No	**8. Does your household own a table?** o Yes o No
4. The roof of the main dwelling is predominantly made of what material? o Grass, Concrete, Plastic sheeting o Iron sheets, Clay tiles, Other	**9. Does your household own an iron (for pressing clothes)?** o Yes o No
5. The floor of the main dwelling is predominantly made of what material? o Sand, Smoothed mud o Smooth cement, Wood, Tiles, Other	**10 Over the past one week (7 days), did you or other in your household consume any sugar?** o Yes o No

Using the PPI to estimate monetary poverty levels

Even relatively inexperienced enumerators can easily administer the country-specific PPI questionnaires. Most of the ten items are simple yes/no questions that any adult member of the household can typically answer. Country-specific scoring sheets (provided by IPA) detail how to calculate a household's estimated probability of living below a given poverty line from the ten question responses. First, the PPI user choses the national and international poverty lines for which to calculate the probability. After probability scores have been calculated for each household, they are averaged to estimate the poverty headcount ratio within the sample as a whole.

To illustrate, let us assume that a household in Malawi has been interviewed, using the PPI questionnaire shown in Table 3. The household head can read and write in English and lives with his wife and two children in a house with a grass roof and cement floor. They typically use charcoal for cooking, own a bed, own a table, but don't own an iron. In the seven days prior to the interview, they have not consumed any sugar. Based on these responses, the PPI methodology estimates that there exists a 71% likelihood that members of this household live on less than $1.90/day.

With its ambitious aim of offering a simple shortcut to estimating monetary poverty rates, the PPI is not without shortcomings.

Firstly, it remains unclear to what extent the PPI can reliably predict monetary poverty within specific target groups. As mentioned above, nationally-representative household surveys underpin the statistical analyses that inform the construction of PPI questionnaires in each country. Based on these analyses, IPA selects a set of items that show a strong relationship to monetary poverty and constructs the PPI scoring cards from the strengths of these relationships. However, it is highly unlikely that these PPI prediction models work equally well across different sub-groups (e.g., cocoa farmers) and locations in a country. It should be noted that this fundamental problem of the PPI is acknowledged by IPA as a 'out of group bias' that is inevitable in most contexts and may cause estimation errors of unknown direction and magnitude.[16]

Secondly, it is doubtful to what extent the PPI can and should be used for monitoring and evaluation purposes. For the index to pick up changes in monetary poverty levels, these changes would also have to affect the PPI indicators in the predicted direction and strength. In other words, the relationship between monetary poverty and the PPI indicators would have to remain constant across time. In addition, certain shocks or developments that are not related to household income can affect PPI scores. For example, for the case of Malawi (see Table 3), a sudden drop in sugar prices would lead to a higher proportion of households having recently consumed sugar, and thus, to a much lower estimate of monetary poverty. For the example household presented above, the predicted likelihood of living below $1.90/day would drop from 71% to 46% if a household member had recently eaten any sugar. Changes in some of the PPI indicators might thus easily be affected by factors other than economic wellbeing. In reverse, a PPI indicator such as the district where a household lives – while useful to predict monetary poverty on a national level – is unlikely to directly respond to changes in household income.

The PPI and living income

Due to the simplicity and low cost of the tool, organizations working in agricultural supply chains have used the PPI in the field.[17] For example, a large-scale sustainable cocoa programme implemented in Indonesia has relied on PPI poverty estimates for both targeting and evaluation.

As the PPI sets out to target the same single (monetary) dimension as living income, the two should expectedly be closely related. However, since the PPI is typically employed in situations where no household income data is available, few studies have been able to explore this relationship empirically and test the validity of the PPI measure.

One exception is the KIT study that has already been cited several times. The authors compared the cocoa farmers' PPI-estimated likelihoods to live below the national poverty lines for those above the living income benchmark versus those below the living income benchmark. For the case of Côte d'Ivoire, no significant differences were found. In other words, according to the PPI estimates, these two groups – farmers above the living income benchmark and farmers below the living income benchmark – did not differ in their risk of

[16] API states that the "PPI scorecard is based on data from a nationally representative group of households. When you apply the survey to a group of households that are not nationally representative – such as a group of farmers or a group of women – there will be 'out of group bias'. […] Most organizations cannot avoid this bias, and since the bias will be different in every case, we cannot predict the bias ahead of time. Those responsible for analyzing PPI results and making strategic decisions based on those analyses should consider how their unique context may affect PPI results." (https://www.povertyindex.org/faq-page)

[17] https://www.sustainablefoodlab.org/wp-content/uploads/2016/02/Sustainable_Food_Lab-PPI_in_Ag_Value_Chains_Study-Kenya_Tea_1.pdf

living in poverty. While more research is necessary, these findings cast doubt on the usefulness of the PPI to reliably estimate monetary poverty in these communities. For Ghana, statistically significant differences were found, with farmers above the living income benchmark having lower estimated probability of living in monetary poverty.

Selected PPI resources

Poverty Probability Index Website. Available at https://www.povertyindex.org

LICOP Webinar with IPA's Director Julie Peachey on uses of PPI: **Measuring income - What income? For what purpose?** Available at https://www.living-income.com/webinars

Interview with Swisscontact on their usage of PPI for evaluation of cocoa development programme in Indonesia. Available at https://www.povertyindex.org/blog/swisscontact-cocoa-program-leverages-ppi-data-online-application

Desiere S., Vellema W. & D'Haese M. (2015). **A validity assessment of the Progress out of Poverty Index (PPI)™**. Evaluation and Program Planning, 49(10-8). Available at https://pubmed.ncbi.nlm.nih.gov/25462937/

Committee on Sustainability Assessment (COSA) (2015). **Testing the Progress out of Poverty Index (PPI)**. Available at https://thecosa.org/publications/

Pape, U. (2019). **Why measuring poverty impacts is more difficult than simply using score cards.** World Bank Blogs. Available at https://blogs.worldbank.org/developmenttalk/why-measuring-poverty-impacts-more-difficult-simply-using-score-cards

CONCLUSION

As this paper has demonstrated, a range of conceptualizations of and measurements for poverty and wealth in the Global South currently coexists. While the monetary approach of poverty lines and living income benchmarks remains a dominant one, other ways of understanding and measuring poverty and wealth have gained increasing traction in the last few decades. Rather than seeing non-monetary approaches in opposition, this paper aims to present them as potentially complementary. From a living income vantage point, adding different conceptualizations of poverty and wealth can add value in at least three domains: gaining a more granular understanding of the livelihoods of a target group; targeting of vulnerable sub-groups; and monitoring and evaluation.

Firstly, looking at poverty and wealth from a non-monetary perspective can offer a more complete and richer understanding of a target population's livelihood, that goes beyond the presence and depth of the living income gap. Here, the MPI can be employed to explore poverty-related limitations and difficulties that households face in their everyday lives. This allows for the identification of poverty-related risks, such as child labor, and the improvement and streamlining of resource allocation. Disaggregating MPI results can also highlight critical disparities between communities that might not have been detected by examining differences in living income gaps. In situations where there is a need to look beyond current income levels and acute poverty, assets-based measures such as the DHS Wealth Index should be considered.

Secondly, non-monetary approaches can play a valuable role for identification and targeting of vulnerable sub-groups. The MPI offers a relatively simple and straightforward manner of identifying households currently facing the most severe levels of deprivation in their day-to-day lives. Disaggregated MPI results also enable programs to focus on those who suffer from deprivations that are regarded as most pressing. These could be access to clean drinking water, access to electricity or school attendance – given its relationship to child labour. Additionally, asset-based approaches can improve identification and targeting. Given their limited responsiveness to recent fluctuations in household income, measures such as the DHS Wealth Index are particularly suited to identify the structurally and long-term vulnerable within a given community.

Thirdly, non-monetary measures can inform monitoring and evaluation systems. As we have seen above, disaggregated MPI results can play a meaningful role in strengthening and enriching the evaluation of most interventions or projects. While not all MPI indicators are susceptible to change across time (e.g., past child mortality and education levels of adult household members), MPI aggregate statistics can be used to track changes in living standards. For example, a recent study on palm and cocoa smallholder farmers in Ghana examined the relationship between certification and MPI-poverty.[18] In contrast, asset-based indices such as the DHS Wealth Index are less suitable to assess short- and mid-term impacts of interventions.

The PPI, like a living income gap assessment, is a monetary-based poverty assessment. The PPI 10-question household questionnaire aims to estimate the likelihood that a household reaches a defined poverty line and is appealing for its low-cost and implementation ease. However, it adds very little value to a living income gap assessment. This is because PPI estimates neither enrich the understanding of a household's experience with poverty – like non-monetary assessments could – nor offer program implementers (companies, governments, NGOs) insight into the potential impact of livelihood interventions – like a living income gap assessment could. In addition to offering a rigorous household income estimate, which calculates the living income gap when matched to a living income benchmark, a detailed household income

[18] Among other things, the researchers found that certified palm oil farmers were less likely to face deprivations in sanitation and cooking fuel than their uncertified colleagues (Rako, Richard & Alexandros, 2020).

survey offers insight into key income levers such as farm productivity and cost of production, crop farmgate prices, and off-farm income. With an understanding of these key income levers, programs can tailor interventions to farmer segmentations based on the most significant barriers that different groups face in improving their income (e.g., high input costs versus minimal income diversification). Furthermore, PPI surveys do not allow for ongoing monitoring and evaluation of program components that target specific deprivations (as an MPI or DHS Wealth index survey could) or target specific income levers such as productivity and price (as a living income gap assessment could).

Most importantly, as crop price is a direct input into household income calculations, the living income approach offers market actors a clear and quantifiable pathway to improve producer livelihoods in their supply chains. None of the other measures discussed in this paper offer guidance on how companies can most effectively leverage trade to improve livelihoods. Private companies have minimal control over broad-based poverty outcomes in their supply chains, such as access to roads, electricity, and other infrastructure. As such, companies should first assess their trading practices before investing in broader social monitoring. This once again drives home the point that all poverty measures come with their specific advantages and shortcomings and should be chosen based on a thorough understanding of the specific data needs at hand. While the MPI is most often used by governments, development agencies, and NGOs, companies that have already advanced sustainability through their trading practices can also draw on non-monetary measures to better understand risks and the impact of community development programs.

Lastly, it is important to note that all the measures discussed in this paper are assessed on household level and therefore, by definition, do not offer insight into intra-household discrepancies.[19] Relying on these measures to assess and monitor poverty can thus easily obscure gendered inequities between members of the same household. This potential blind spot should be well understood by users of any household-level poverty measures.

[19] For an example of a promising attempt to measure the MPI on individual level, see: Lekobane, K.R. Leaving No One Behind: An Individual-Level Approach to Measuring Multidimensional Poverty in Botswana. Soc Indic Res 162, 179–208 (2022). https://doi.org/10.1007/s11205-021-02824-2