Perceptions of poverty: Evaluating Multidimensional Poverty Assessment Tool derived rankings and global development indicators in five African nations

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Perceptions of poverty: Evaluating Multidimensional Poverty Assessment Tool derived rankings and global development indicators in five African nations

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Abstract

This study assessed an array of indicators for rural poverty assessments and evaluated use of the Multidimensional Poverty Assessment Tool (MPAT) as a proxy for commonly used indicators, such as the Human Development Index, Gross National Income, Global Hunger Index, and the Gender Inequality Index. MPAT data from 5322 rural households across five countries in Africa were analyzed. While MPAT aligned well with development indicators for Kenya, Lesotho, and Tanzania, this was not the case for Eswatini and Zimbabwe. Overall, MPAT-based rankings correlated well with hunger, food security, and gender equality indicators. Our findings highlight the use of MPAT-derived indices as valuable supplements for commonly used development indicators.

KEYWORDS
development metrics, food security, multidimensional poverty, poverty indicators, rural poverty, sub-Saharan Africa

1 | INTRODUCTION

Smallholders (managing farms <2 ha) account for 84% of all farms worldwide (Lowder et al., 2021) and constitute the majority of the world's poor and hungry (Von Grebmer et al., 2019). Within the context of sustainable development, initiatives that support smallholder production and wellbeing are central and urgent.

Poverty assessments can help inform and develop sustainable development strategies, and the targeting, design, monitoring and evaluation of development projects, particularly in the face of climate change which negatively impacts rural livelihoods. Indicators and composite indicators are commonly used to inform development initiatives, both for policy-making and for communicating performance (Singh et al., 2009). Poverty indicators, although highly useful for standardized assessments and comparisons, often present a significant drawback in that they tend to (over)simplify the complexity of poverty. Existing research demonstrates that poverty manifests itself in multiple dimensions and measuring poverty using more than one or two indicators provides more accurate results (Yang & Paudel, 2023). While there is a general consensus that poverty and wellbeing are multidimensional and that deprivations and achievements go beyond income (Alkire, 2007; Barrett, 2005; Bourguignon & Chakravarty, 2003; Sen, 1985), there remains debate as to whether various dimensions of poverty can be, or should be, aggregated into a single, multidimensional index in a meaningful way (Cohen, 2009; Lustig, 2011).

Indicator systems have long been criticized for their poor ability to speak to cause-effect relationships (Pissourios, 2013) and their redundant representation of certain aspects, depending on the indicator selection (Patten, 2006). The value of an indicator depends on the quality of the data used to construct it, its ability to describe a context, and the caution with which it is used to inform programmes and policies (Cohen, 2010). Indicator selection and usage in the context of poverty reduction programmes and sustainable development assessments requires well-defined criteria, otherwise, the analysis can be compromised by the availability of multiple indicators from several sectors (da Silva et al., 2020). Rural poverty assessments tend to either produce 'narrow' data that is useful for sector-specific interventions or are so in-depth that the surveys become very expensive and time-consuming and result in datasets that end up being unmanageable (Cohen, 2010). As a result, there is a need to find a balance between standardizing assessments (in order to compare countries and regions) and catering for contextualization so as to adequately measure the dimensions of poverty at a meaningful resolution and to act commensurately.

Central to successful rural poverty alleviation at a local level is an enhanced understanding of what constitutes destitution, what challenges exist, and what aspirations look like for the rural poor themselves. The choice of research method for this study was guided by the desire to capture perceptions of the rural poor. The selection of indicators to inform policy-making and development plans can influence the status attributed to a country, an individual, a community and so forth. As a result, caution is central to the selection of indicators to inform targeting. This study proposes an innovative combination of more rigorous and generalizable assessments (e.g. GHI) with quicker, cheaper and more participatory methods (e.g. Multidimensional Poverty Assessment Tool [MPAT]) to better inform targeting and project management in a specific area.

The MPAT, a rural poverty-focused tool, was designed in part to try and find this balance (Cohen, 2010). MPAT measures 11 core dimensions of rural poverty by collecting data general enough to be relevant across various contexts, yet specific enough to serve the needs of researchers, beneficiaries, investors, project managers, policymakers and others. Specifically, the core dimensions (components) of MPAT are (i) food and nutrition security; (ii) domestic water supply; (iii) health and health care; (iv) sanitation and hygiene; (v) housing, clothing and energy; (vi) education; (vii) farm assets; (viii) non-farm assets; (ix) exposure and resilience to shocks; (x) gender and social equality; and (xi) adaptation to climate change (Figure 1) (IFAD, 2014).

MPAT was developed via an initiative led by the United Nations International Fund for Agricultural Development (IFAD) and was iteratively refined and tested in cooperation with government partners, international NGOs, academic institutions and local partners. Financial support for MPAT's initial development in China and India (2008–2009) (Cohen, 2009) and refinement in Bangladesh and Mozambique (2012–2013) (IFAD, 2014) was primarily provided by IFAD, the United Kingdom's Department for International Development (DFID) and in-kind contributions

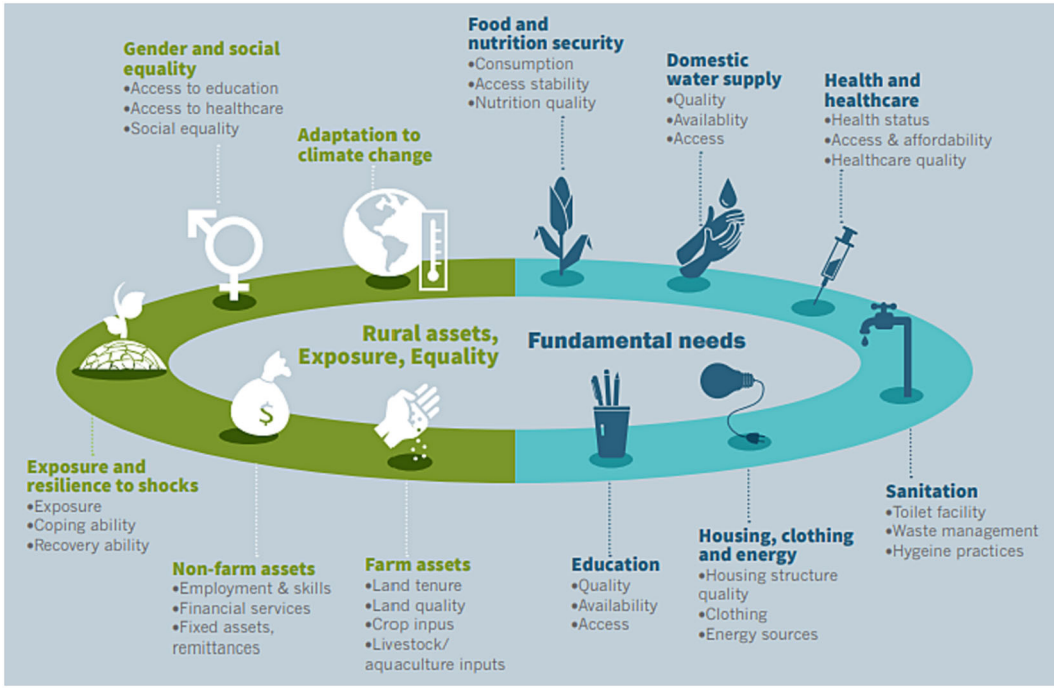

FIGURE 1 Overview of the Multidimensional Poverty Assessment Tool (MPAT)'s 11 components. Figure source: Reproduced from (IFAD & World Agroforestry, 2019). [Colour figure can be viewed at wileyonlinelibrary.com]

from various government partners and others. MPAT data are collected primarily via administered household-level surveys, and additional data for some components (education, health, gender) are also collected from village-level administrators, educators and healthcare staff. Since its release in 2010, MPAT has been used in various countries in Asia and Africa as a data collection tool for development programmes as well as research projects. Although MPAT has been used in other sub-Saharan countries such as Mali and Burkina Faso, that data was not used for the purpose of this paper for two reasons: Firstly, the lead author was not directly involved in the data collection and cleaning process and, secondly, only MPAT data from the latest version of MPAT (i.e. with the 11th component) were used in these analyses (for consistency).

Rather than defining and measuring the quality of life that the rural poor may strive to obtain, MPAT assesses the overall environment within which people live, their access to information, support, and services, and their general state of wellbeing across a number of dimensions. MPAT theoretical rationale is based largely on the basic needs framework (Streeten & Burki, 1978), as well as Sen's work on the importance of enabling people as both the means and the ends of 'development' (Sen, 2000, 2005), and findings from other poverty-focused researchers (Narayan et al., 2009). Central to MPAT's development is the idea that income (or economic growth), even if accurately measured, does not provide a reliable proxy measure of poverty and that a multidimensional assessment is needed (Bourguignon & Chakravarty, 2003; Cohen, 2010; Hicks & Streeten, 1979; IFAD, 2014). Each of MPAT's subcomponents includes an analysis of the level of quality and reliability (or availability) of the dimension, as well as people's access to it. MPAT's intention is not to rank households, regions or countries but rather to capture the perceptions of respondents and identify which dimensions of poverty are more likely to require attention.

Each of MPAT's 11 components is itself a composite indicator composed of three or four subcomponents. The subcomponents are in turn composed of multiple survey items from the MPAT household survey. Thus, while MPAT components themselves are composite indicators, MPAT is a thematic indicator overall because all 11 component scores stand alone and are not combined or averaged together.

Numerous well-known indicators are currently used to inform needs assessments and policy-making in the area of development and poverty reduction. Indicators such as the Human Development Index (HDI), Gross National Income (GNI), Global Hunger Index (GHI) scores and the UNDP Gender Inequality Index (GII) are also the products of significant conceptualization by experts in respective fields and have been subject to much reflection, revision, criticism and adjustments.

This paper examines tradeoffs between the depth of information and the practicality of obtaining it by exploring whether MPAT can be employed as a sufficiently useful complement to existing global indices. We also assess whether participatory and perception-based data from MPAT offers a means to interpret results and rankings from commonly used global development indices, while at the same time using those global indices to assess the potential generalizability of MPAT data. In this paper, we first present an overview of how rural households in five countries across East and Southern Africa (Eswatini, Kenya, Lesotho, Tanzania and Zimbabwe) report various aspects of their wellbeing and access to services based on MPAT's 11 components. With acknowledgement of the different intended uses and designs of other indicators, we then examine which thematic combinations of MPAT components and sub-components could potentially supplement the HDI, GNI, GHI and GII indicators. Our overarching goal is not to add to the extensive body of literature on the shortcomings of development indicators (e.g. see Kovacevic, 2010 for a compendium of critiques on the HDI), but rather to compare commonly used existing global indicators with values and country rankings derived from MPAT data collected in five countries in East and Southern Africa.

2 | MATERIALS AND METHODS

2.1 | Data collection

MPAT survey data were collected from 5322 households across five East and Southern African countries from 2017 to 2019: Eswatini, Lesotho, Kenya, Tanzania and Zimbabwe (Table 1). Data collection was conducted by local enumerators who were trained in ethical considerations. Surveys were conducted using computer-aided personal interviewing on tablet devices. Villages and households were selected using a two-stage sampling methodology (IFAD, 2014): (i) Villages were selected in each cluster and (ii) Households within selected villages were randomly sampled.

Locally hired translators translated the survey questionnaire into respective local languages and dialects (Kiswahili, Sesotho, etc.), which were then checked using reverse translation. Enumerator training and piloting phases in each respective country allowed for the validation of surveys to ensure that no question was inadvertently culturally inappropriate. Completed interviews were uploaded to a server daily and a thorough data quality checking process was conducted by the lead author to screen responses. Outliers, errors and other questionable responses were flagged to enumerators for clarification or corrections prior to each new day of data collection. The rights of

TABLE 1 Data collection overview information by country.

Country	Country population (World Bank, 2023)	% of population rural (World Bank, 2023)	Year data collected	No. of households	Sampling approach
Kenya	49 million	73.4%	2017	996	Subnational (3 out of 8 provinces)
Lesotho	2 million	72%	2017	1292	National
Eswatini	1 million	76%	2018	1198	National
Zimbabwe	15 million	68%	2018	990	Subnational (4 out of 10 provinces)
Tanzania	60 million	65.5%	2019	846	Subnational (5 out of 31 regions)

interviewees were prioritized, including obtaining informed consent, data protection and confidentiality and making clear that participants had the right to withdraw at any time.

2.2 | Data analysis

The open-source MPAT toolkit (IFAD, 2014) includes an Excel analysis tool for importing and automatically analysing survey data. Raw data were downloaded on a daily basis in tabular format from the server and aggregated in a spreadsheet after any necessary data cleaning or corrections were made. The raw data were then transformed to match the paper version results (i.e. when the MPAT survey was digitized, a number of questions were separated as compared to the paper versions) and entered into the automated MPAT spreadsheet. The MPAT Excel tool then automatically assigns standardized response values as well as weights to aggregate survey items into subcomponents, and subcomponents into components, all ranging in scores from 10 (*lowest*, *worst*) to 100 (*highest*, *best*) at household, village and project scales.

Statistical analyses were conducted using R (version 4.1.2) and Microsoft Excel. We used violin plots to help visualize distributions of MPAT component scores as well as the peaks in the data, to depict both summary statistics and score densities for each component across all countries in our study. Bar plots were also generated to compare subcomponent scores of the MPAT Food and Nutrition Security (i.e. nutrition quality, consumption and access stability) across countries with the GHI, after inverting GHI country scores to better facilitate comparison (i.e. 100 - GHI), as well as to compare the MPAT Gender and Social Equality subcomponent scores (i.e. access to education, access to health care and social equality) across countries with the GII. Mean values were calculated for each subcomponent score by country using R, and missing values were excluded from the analysis. Calculated mean values were then exported from R to an Excel file, and the respective indices (i.e. 100 - GHI and GII) were added to create the bar plots.

2.3 | Comparing MPAT with other indices

To assess the extent to which MPAT subcomponent and component data reflect findings from indicators such as UNDP's HDI and the World Bank's GDP per capita, we compared the ranking of the countries in our sample. Values for the HDI, GNI, GHI and GII were obtained for the same year/s that MPAT surveys were completed in each country. Table 2 presents an overview of the global indices and what components and subcomponents (see Figure 1) we used from MPAT to facilitate comparisons based on the nature of the indicators compared against, as described below.

2.3.1 | The Human Development Index (HDI)

The HDI (UNDP, 2023b) is a widely used tool for quantifying development; the HDI emphasizes that people and their capabilities are the ultimate criteria for assessing development, rather than focusing solely on economic growth. The HDI is composed of normalized indices for each of three dimensions: (i) Health—assessed by life expectancy at birth; (ii) Education—measured by mean of years of schooling for adults above 25 years and expected years of schooling for children of school entering age; and (iii) Standard of living—measured by GNI per capita. These three indices are then aggregated into a composite index using a geometric mean.

Reflecting on these three building blocks we created a comparable MPAT indicator to HDI by aggregating four MPAT components: Farm Assets, Non-farm Assets, Education, and Health and Health Care. Each of the four MPAT components is composed of subcomponents. For Farm Assets, this includes (i) Land Tenure, (ii) Land Quality, (iii) Crop Inputs and (iv) Livestock/Aquaculture inputs. For Non-Farm Assets, this includes (i) Employment and Skills,

TABLE 2 MPAT components used to construct indices for comparison with global indicators.

Comparison indicator	MPAT components used for comparison
Human Development Index (HDI)	
% of population under poverty line	Average of Farm Assets and Non-Farm Assets components
% of population with access to a health centre within x amount of km	Health and Health Care sub-component score 3.2 Access and Affordability
Food security levels (stunting and wasting)	Health and Health Care sub-component score sub-component score 3.1 Health status
% of population considered vulnerable (<19 and >64 years)	Health and Health Care sub-component score sub-component score 3.3 Health-care quality
Access to basic education	Education component
Gross National Income (GNI)	Average of Farm Assets and Non-Farm Assets components
Global Hunger Index (GHI)	Food and Nutrition Security component
Gender Inequality Index (GII)	Gender and Social Equality component

Abbreviation: MPAT, Multidimensional Poverty Assessment Tool.

(ii) Financial Services and (iii) Fixed Assets and Remittances. The Education component is composed of (i) Quality of, (ii) Availability of and (iii) Access to Education. The Health and Health Care subcomponents include (i) Health Status, (ii) Access and Affordability and (iii) Healthcare Quality. Within this calculation, the Assets and Non-Farm Assets components were combined into one score to represent a proxy for the standard of living, similar to that of the GNI. The choice of these components was inspired by the three dimensions of human development (income, health and education) presented in the HDI.

2.3.2 | The Gross National Income (GNI)

The gross domestic product (GDP) (the monetary value of final goods and services produced in a country in a given period of time) is typically the most commonly accepted measure of a country's economic performance. However, increasing importance is given to the GNI as a better measure of the financial resources available to a country's population (Capelli & Vaggi, 2013).

It is now more widely recognized that material living standards are more closely associated with national income (GNI) rather than with national production (GDP) (in times of depreciation, for example, production can expand while income decreases) (Stiglitz et al., 2009). Moreover, the GNI is considered a better indicator as it captures the incomes related to the mobility of factors of production (e.g. wages earned by cross-border workers) (Capelli & Vaggi, 2013). The GNI is calculated by taking a country's GDP, adding net receipts from abroad and subtracting subsidies on production.

As discussed above, we created a comparable MPAT indicator to GNI by aggregating the Farm Assets and Non-Farm Asset component scores as a proxy to represent income. These two components include the following subcomponents: Farm Assets (i) Land Tenure, (ii) Land Quality, (iii) Crop Inputs and (iv) Livestock/Aquaculture inputs and Non-Farm Assets (i) Employment and Skills, (ii) Financial Services and (iii) Fixed Assets and Remittances.

2.3.3 | The Global Hunger Index (GHI)

The GHI, developed by the International Food Policy Research Institute (IFPRI), is a composite index formed by aggregating three equally weighted indicators: (i) proportion of population undernourished as a percentage of the

population; (ii) prevalence of underweight children under 5 years of age; and (iii) under-five mortality rate (Wiesmann, 2006).

Data for the child mortality and undernourishment components come from the United Nations International Children's Emergency Fund (UNICEF) and the Food and Agriculture Organisation (FAO), respectively. The child underweight component of the index originates from three sources: (i) The World Health Organisation (WHO) global database on child growth and malnutrition; (ii) Demographic and health survey data; and (iii) UNICEF's multiple indicator cluster survey reports. Countries are ranked on a 100-point scale, categorized from 'low' to 'extremely alarming' hunger. GHI scores above 10 are considered serious, scores greater than 20 are alarming and scores beyond 30 are extremely alarming (GHI, 2023).

We used the MPAT Food and Nutrition Security component to compare with the Hunger Index Scores. MPAT's Food and Nutrition Security component is composed of three subcomponents: (i) Consumption; (ii) Access Stability; and (iii) Nutrition Quality.

2.3.4 | The UNDP Gender Inequality Index (GII)

The GII, developed by the United Nations Development Programme (UNDP, 2023a), is a composite measure of gender-based disadvantage in three dimensions: (i) Reproductive health; (ii) Female empowerment and (iii) Labour market participation (UNDP, 2023a). GII's purpose is to provide a measure of the human development costs of gender equality. The higher the index value, the greater the disparity between women and men and therefore the greater the losses to human development (Barnat et al., 2019).

In order to compare with UNDP GII scores, we used the MPAT Gender and Social Equality component, which is composed of three gender-focused subcomponents: (i) Access to education; (ii) Access to health care; and (iii) Social Equality.

3 | RESULTS

3.1 | MPAT scores by component

The distributional characteristics of the MPAT components across all five countries, as well as the range of scores, are displayed in Figure 2. The width of the 'violins' in the figure corresponds to the count of households that share the same score. The widest section of the violin graphically illustrates the highest frequency of households attaining the given score. Positioned centrally within the violin is a delineating line that represents the median of the scores. Concurrently, the uppermost line on the violin signifies the third quartile of the scores, whereas the lowermost line denotes the first quartile of these scores. Figure 2 reveals that the components with the highest MPAT scores (i.e. most optimal) across all five countries were 'Food and Nutrition Security' and 'Gender and Social Equality'. While both of these components display the highest medians and interquartile ranges out of all 11 components, they also show evidence of high variability over the range of scores.

The two MPAT components with lower overall scores were the 'Exposure and Resilience to Shocks' and 'Adaptation to Climate Change' (i.e. overall, households in all five countries perceive themselves to be highly exposed to shocks and stresses and to have low resilience and adaptive capacities to adapt to a changing climate). The component on 'Exposure and Resilience Shocks' presents the lowest median score out of all 11 components. It is noteworthy that these indicators are not assessed by any of the four comparison indices in our study: HDI, GNI, GHI or GII.

Households across all five countries perceive themselves to have low ownership of 'Non-farm Assets' (TV, radio, etc.) This was also the component with the lowest degree of variability and the third lowest median score (after the components on resilience and adaptation).

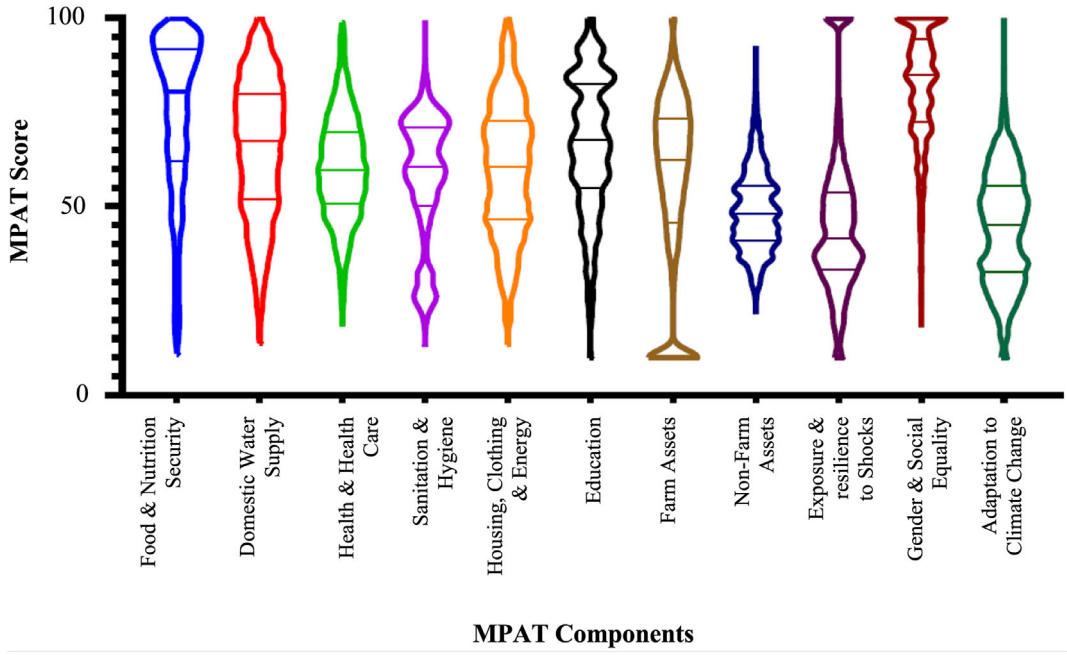

FIGURE 2 Distribution of Multidimensional Poverty Assessment Tool (MPAT) scores by component across all five countries. [Colour figure can be viewed at wileyonlinelibrary.com]

3.2 | MPAT in the context of other data—relative rankings

To assess whether MPAT data reflect findings from the HDI, GNI, GHI and GII, we compared the ranking of the countries in our sample for all indicators, as shown in Table 3.

Our results show that perceptions of food security from the households in our sample align well with the GHI assigned to those countries, as well as perceptions of gender equality with the GII (with the exception of Eswatini and Zimbabwe). We noted that for comparisons of all indices in general, Eswatini and Zimbabwe did not align well. Were these two countries to be separated from our data set, the scores would align almost perfectly for all indices.

Kenya, Lesotho and Tanzania all ranked the same between the GHI and MPAT-based scores (1st, 3rd and 4th). When looking at the GII and the MPAT scores on Gender and Social equality, the scores also align well with Kenya scoring highly for both (1st and 2nd place), Lesotho being placed 3rd in both, and Tanzania in 4th and 5th place, respectively. MPAT comparisons with GNI are also reasonably similar but the same cannot be said for HDI, in which none of the countries ranked comparably. We noted that poorer countries (in terms of HDI per capita) had high MPAT scores and richer countries (in terms of higher HDI per capita) had lower MPAT scores which could be an indication of relative deprivation in richer countries.

In terms of consistencies amongst countries, Kenya was the most consistent in comparisons (i.e. always scoring first or second place) and for corresponding MPAT scores. Eswatini and Zimbabwe were the countries that almost always displayed inconsistencies between perceptions (i.e. MPAT) and the four global indices. For example, our sample reported low perceptions of asset ownership and food security in Eswatini, when in fact, the country scored highly in the global indices (HDI, GNI and GHI). On the other hand, households in Eswatini perceived themselves to experience high levels of gender equality while the country had the lowest GII score in our sample. Similarly, Lesotho ranked highest in the MPAT asset score but lowest in its HDI.

Figure 3 shows that MPAT Food and Nutrition Security scores aligned well with the GHI. When we broke down this MPAT component into three subcomponents (consumption, food access stability, nutrition quality), we found

TABLE 3 MPAT scores compared with other data.

Rank	HDI	MPAT: Average of Farm Assets, Non-Farm Assets, and Education, Health and Health Care Scores	GNI per capita	MPAT: Average of Farm Assets and Non-Farm Assets Scores	Hunger Index (GHI)	MPAT: Food and Nutrition Security score	UNDP Gender Inequality Index (GII)	MPAT: Gender and Social Equality Score
1st	Eswatini (0.61)	Lesotho (64.21)	Eswatini (7913.63)	Kenya (62.18)	Kenya (21)	Kenya (84.28)	Kenya (0.52)	Eswatini (87.16)
2nd	Zimbabwe (0.60)	Kenya (63.60)	Kenya (4126.28)	Zimbabwe (59.20)	Eswatini (22.5)	Zimbabwe (83.36)	Zimbabwe (0.54)	Kenya (86.29)
3rd	Kenya (0.57)	Eswatini (58.61)	Zimbabwe (3864.01)	Tanzania (49.17)	Lesotho (24.1)	Lesotho [77.01]	Lesotho (0.56)	Lesotho (83.30)
4th	Tanzania (0.548)	Zimbabwe (56.74)	Lesotho (3031.41)	Eswatini (48.81)	Tanzania (28.6)	Tanzania (68.66)	Tanzania (0.56)	Zimbabwe (75.53)
5th	Lesotho (0.52)	Tanzania (52.93)	Tanzania (2693.54)	Lesotho (45.59)	Zimbabwe (32.9)	Eswatini (61.43)	Eswatini (0.56)	Tanzania (74.69)
Data Source	(UNDP, 2021)	This study	(World Bank, 2017)	This study	(GHI, 2023; Von Grebmer et al., 2017, 2018, 2019)	This study	(UNDP, 2023a)	This study

Abbreviations: GHI, Global Hunger Index; GNI, Gross National Income; HDI, Human Development Index; MPAT, Multidimensional Poverty Assessment Tool; UNDP, United Nations Development Programme.

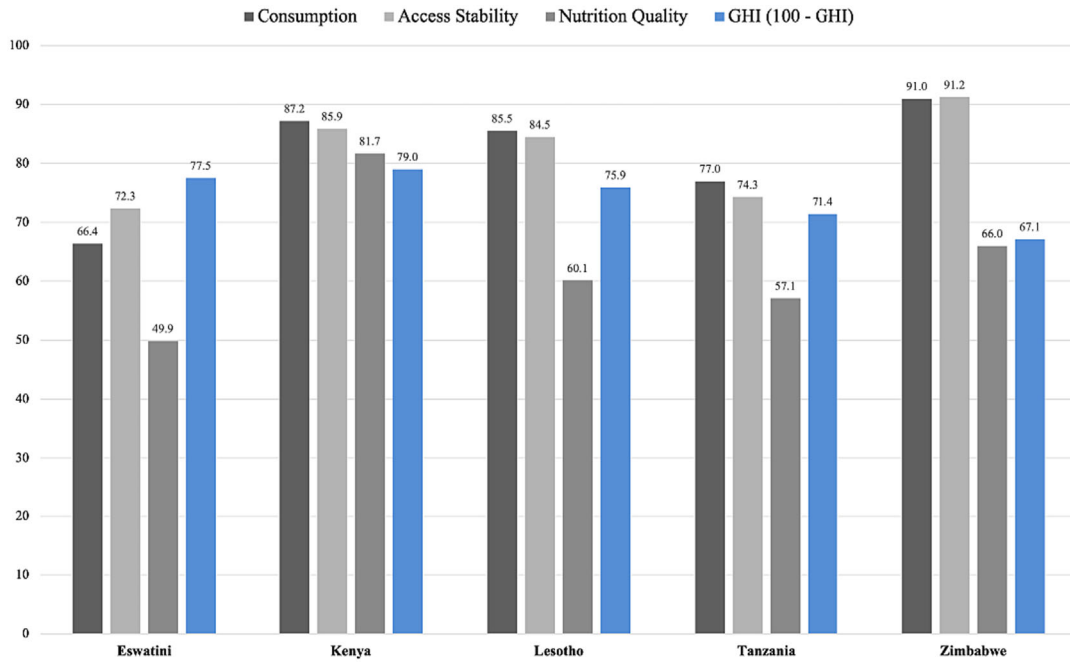

FIGURE 3 Multidimensional Poverty Assessment Tool (MPAT) Food and Nutrition Security scores compared with Global Hunger Index (GHI) by country. [Colour figure can be viewed at wileyonlinelibrary.com]

that it is nutrition quality that systematically lowers the MPAT 'Food and Nutrition Security' score for all countries ('nutrition quality' is not covered by the GHI so this appreciation need not surprise yet adds to the advantages of MPAT). Figure 3 also reveals that the sub-component score with the highest scores for all countries (with the exception of Eswatini) is 'consumption' indicating that households have a good perception of their level of consumption of food.

Figure 4 shows that households in all five countries perceive that women have better access to health care than to education. Households in Kenya have the highest perceptions of social equality out of all five countries, which is consistent with the GII ranking.

While the UNDP GII score is the same for Eswatini and Lesotho, households in Eswatini have a better perception of their levels of social equality than households in Lesotho. Table 3 revealed that Eswatini fared the best in terms of MPAT Gender and Social Equality but the worst in terms of ranking for GII within our sample of five countries. We noted that when breaking down the MPAT subcomponent, it was the Social Equality subcomponent that fared particularly well in Eswatini, although this was also the case for the Access to Health Care subcomponent.

4 | DISCUSSION

When we compared MPAT indicators with global indicators such as the HDI, GHI, GNI and GII, we found there to be reasonable comparisons in the rankings, with the exception of Eswatini. With Eswatini removed, the rankings are far more comparable, as shown in Table 4.

Despite the fact that rankings using these indicators appear broadly similar, there are important underlying differences beyond the metrics used for comparison. Perhaps most importantly, MPAT focuses on rural areas

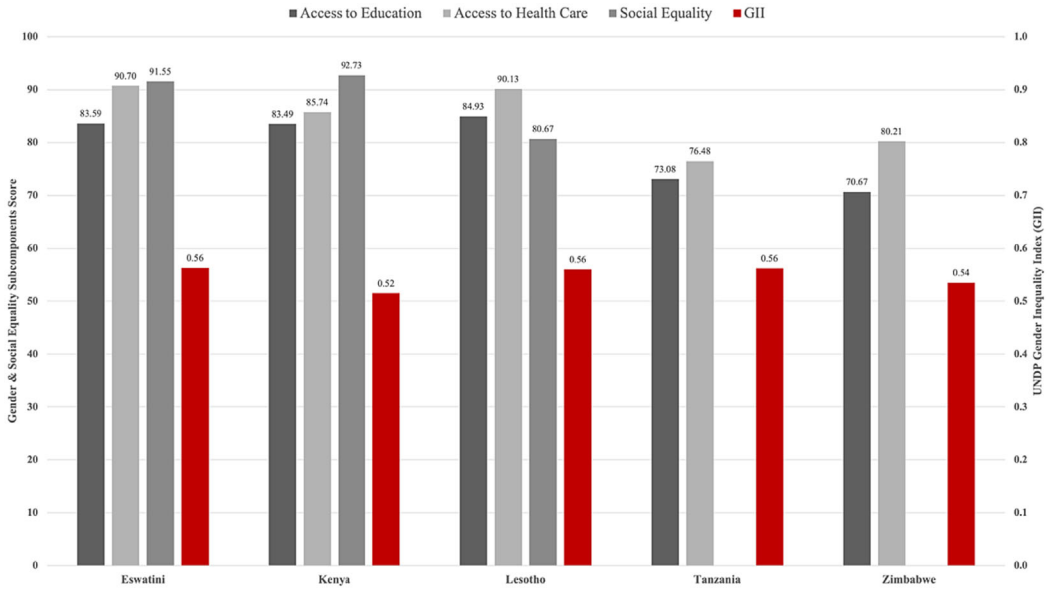

FIGURE 4 Multidimensional Poverty Assessment Tool (MPAT) Gender and Social Equality subcomponents scores compared with Gender Inequality Index (GII) by country. *Note*: No data for Social Equality were collected for Zimbabwe and Tanzania given the sensitive nature of the questions and the imminence of governmental elections in the respective countries. [Colour figure can be viewed at wileyonlinelibrary.com]

while the other indicators are intended to be nationally representative, and include data from both rural and urban areas. With regard to our comparisons two of our datasets were national (Eswatini and Lesotho), but we found that although Lesotho compared well with most indicators (GHI, GNI and GII), Eswatini almost always ranked the polar opposite. A related key factor is sample size. Interestingly, of the five countries in our dataset, Kenya tracked best with existing global indices, despite being too small of a sample to be considered representative of the country (three out of eight provinces, and only rural households). As our sample of households from Eswatini was national, it would have been expected that those rankings would be more likely to align. We assumed that the fact that the other global indices included urban households could account for such large differences. However, 76% of Eswatini's population is rural (Table 1)—the highest proportion in our sample of countries—and hence, this may not explain the divergence in rankings. More broadly, the data used to inform MPAT and to inform the HDI, GNI, GHI and GII are very different. In the following sections, we discuss the results by indicator and explore this further.

4.1 | Comparing MPAT and the HDI

We found that the HDI rankings and the rankings for MPAT's equivalent of the HDI compared the least well (along with the GNI). Lesotho, for example, ranked worst with HDI, but best with MPAT. This could be explained by the fact that HDI presents averages and, as a result, conceals disparities in the distribution of human development in the overall population. In the MPAT sample, on the other hand, the disparities between the households are likely to be smaller (i.e. only rural households) despite also being average (albeit based on geometric averages). For a better comparison, one approach would be to calculate separate HDIs for urban and rural populations and then compare the rural populations' results with MPAT scores.

TABLE 4 MPAT scores compared with other data after removing Eswatini.

Rank	HDI	Average of MPAT Farm Assets, Non-Farm Assets, and Education, Health and Health Care scores	GNI per capita	Average of MPAT Farm Assets and Non-Farm Assets scores	Hunger Index (GHI)	MPAT Food and Nutrition Security score	UNDP Gender Inequality Index (GII)	MPAT Gender and Social Equality score
1st	Zimbabwe (0.60)	Lesotho (64.22)	Kenya (4126.28)	Kenya (62.18)	Kenya (21)	Kenya (84.28)	Kenya (0.515)	Kenya (86.29)
2nd	Kenya (0.57)	Kenya (63.60)	Zimbabwe (3864.01)	Zimbabwe (59.27)	Lesotho (24.1)	Zimbabwe (83.50)	Zimbabwe (0.54)	Lesotho (83.31)
3rd	Tanzania (0.55)	Zimbabwe (56.85)	Lesotho (3031.41)	Tanzania (49.17)	Tanzania (28.6)	Lesotho (77.00)	Lesotho (0.56)	Zimbabwe (75.45)
4th	Lesotho (0.52)	Tanzania (52.93)	Tanzania (2693.54)	Lesotho (45.62)	Zimbabwe (32.9)	Tanzania (68.66)	Tanzania (0.562)	Tanzania (74.69)
Data Source	(UNDP, 2021)	This study	(World Bank, 2017)	This study	(GHI, 2023; Von Von Grebmer et al., 2017, 2018, 2019)	This study	(UNDP, 2023a)	This study

Abbreviations: GHI, Global Hunger Index; GNI, Gross National Income; HDI, Human Development Index; MPAT, Multidimensional Poverty Assessment Tool; UNDP, United Nations Development Programme.

4.2 | Comparing MPAT and the GNI

Comparing the GNI ranking and the ranking of the MPAT equivalent of the GNI, fared the least well, alongside the HDI comparison. The only two countries that were fairly comparable were Kenya and Zimbabwe, ranking amongst the top three for both indicators.

The difference in rankings can be explained in part by the issue of relative wellbeing when a household perceives itself to be well off when the households that surround it have the same level of income/wealth. Another reason that might explain the disparity in our rankings is that the GNI may be underestimated in lower-income economies that have more informal subsistence activities as well as unilateral transfers (foreign aid and remittances, for example). If we were to gather data on informal subsistence activities, foreign aid and movement of people, and notice that the level of subsistence activities and unilateral transfers are highest in Tanzania or Lesotho (the two countries with the lowest rankings for GNI in Table 3); then this might explain why the rankings do not match.

In addition, household income and consumption should also reflect in-kind services provided by governments, such as subsidized health care and educational services, which MPAT does help to capture (by asking how affordable health care and education is) but the GNI does not.

4.3 | Comparing MPAT and GHI

Our results show that perceptions of food security from the households in our sample align well with the GHI assigned to those countries. Kenya, Lesotho and Tanzania all ranked the same between the GHI and MPAT scores (1st, 3rd and 4th). Eswatini and Zimbabwe, however, did not compare well. Similarly, to the discussion on GNI above, this discrepancy in rankings between MPAT and GHI might be attributable to the idea of relative poverty where households consider themselves food insecure only if they eat less than their counterparts.

Moreover, the GHI uses equal weightings whereas the (standardized) MPAT is based on expert weightings for its subcomponents on access, stability and nutrition quality. One of the GHI's indicators, the proportion of population undernourished is not a prevalence indicator derived from individuals' food consumption data, but rather a macro-economic indicator derived from *per-capita* food availability. MPAT, on the contrary, separates food consumption and availability. One thing to note is that both the GHI and MPAT fail to capture potential inequitable distributions and access to food within households.

4.4 | Comparing MPAT and GII

Gender refers to the context-specific, socially constructed attributes, opportunities, roles and relationships that are given to women and men, girls and boys (UN Women, 2023). Our results show that perceptions of gender equality (MPAT) compare well with the GII (with the exception of Eswatini and Zimbabwe). Table 3 revealed that Eswatini fared the best in terms of MPAT Gender and Social Equality but the worst in terms of ranking for GII within our sample of five countries.

The difference may be accounted for by the fact that the two indicators (GII and MPAT) do not measure the same thing. For example, we noted that when breaking down the MPAT subcomponent, it was the 'Social equality' subcomponent that fared particularly well in Eswatini (Figure 4). This subcomponent applies to more than gender (e.g. an MPAT survey question for this subcomponent asks whether the respondent feels that all groups have equal opportunities). Moreover, the GII focuses on three domains not directly covered by MPAT: reproductive health, female empowerment and labour market participation.

4.5 | Limitations

Table 2 shows that MPAT encompasses and aggregates components and subcomponents closely related to all four major global indices covered in our analyses, however, these indicators were, of course, not designed with the intention of being directly compared, and thus, this is a broader limitation of our overall analysis. Our analysis was also limited to comparison for score rankings for only these five countries. Similar analyses with MPAT data from other countries would help further elucidate the degree to which these MPAT-derived indicators are comparable to the HDI, GHI, GNI and GII. In addition to this, no comparable analysis of indicators exists in recent literature to corroborate the results of this paper. Finally, the use of data from rural and urban areas for the HDI, GHI, GNI and GII would be expected to skew comparisons with the rural-focused MPAT indicators. We did not have access to HDI, GHI, GNI and GII data disaggregated by rural and urban areas within these countries, and so we were unable to conduct a more nuanced, rural-focused, comparative analysis.

5 | CONCLUSIONS

Poverty is relative, multidimensional, complex and deeply embedded in local and broader culture, history, politics and geography. Measuring multiple dimensions of poverty is important, but even for multidimensional poverty indices, it is important to question how much, and what, single, aggregated, values can reveal about poverty or wellbeing in a location. No consensus exists for what constitutes development, let alone how to achieve sufficient levels of development; it is not surprising then that alternative understandings of concepts and processes in the development discourse lead to different frameworks and indicators for understanding and attempting to measure poverty.

MPAT, as well as the HDI, GHI, GNI and GII, are indicators of course, but more broadly, they reflect statements about the means and goals of rural development and poverty reduction and are shaped by the sociopolitical and other predilections of their creators. Indeed, the framing of development and poverty reduction metrics in certain ways in turn favours different poverty reduction priorities and strategies over others. When our measurements are flawed, and by nature of the complexity of poverty they inevitably are, the decisions that we make based on resulting data are necessarily distorted. More simply put, our findings add to the evidence that *what we measure affects what we do* (Stiglitz et al., 2009).

Overall, our analyses demonstrate that MPAT has the potential to be used as a complement to existing indices and to render macro data for policy action into locally applicable micro data that can more accurately inform targeting and poverty reduction project management in specific domains. With regard to country-level development and poverty-related comparisons, our findings demonstrate how the choice to use a particular tool or indicator can influence our understanding of relative levels of development or poverty.

AUTHOR CONTRIBUTIONS

Fanny Minjauw: Conceptualization; formal analysis; data curation; methodology; investigation; writing—original draft; writing—review and editing. **Md Rasheduzzaman**: Data curation; formal analysis. **Philipp Baumgartner**: Writing—review and editing. **Peter Dorward**: Writing—review and editing. **Graham Clarkson**: Writing—review and editing. **Alasdair Cohen**: Methodology; supervision; writing—review and editing.

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CONFLICT OF INTEREST STATEMENT

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study may be available in an aggregated form on reasonable request from the corresponding author. The raw data are not publicly available due to their containing information that could potentially compromise the privacy of households currently or previously participating in IFAD programmes.

ETHICS APPROVAL STATEMENT

These projects were approved by IFAD and informed consent was obtained from all participants prior to data collection (participants were also informed that they could withdraw at any time).

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