

RESEARCH ARTICLE

Headship of Household and Multidimensional Poverty in Sudan: An Empirical Analysis for the Case of Al Manqil Locality, 2023

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Abstract

This study examines the persistence of multidimensional poverty among households based on the gender of headship in Al Manqil Locality. Utilizing the Alkire-Foster model, the research draws on primary data collected through structured questionnaires provided by the Central Bureau of Statistics for the year 2023, encompassing a total of 764 randomly selected households. The analysis of poverty, disaggregated by urban and rural locations, categorizes householders into two primary groups: male-headed and female-headed. Findings reveal that approximately forty-eight percent of female-headed households experience multidimensional poverty, a rate seven percent higher than male-headed households. Deprivation appears concentrated across all dimensions, with the low standard of living emerging as the principal contributor to poverty throughout the locality. The study concludes that household headship plays a crucial role in determining poverty levels within households.

Keywords: Headship of Household, Female-householder, Multidimensional Poverty, Alkire-Foster Model, Sudan, Al Manqil Locality.

1. Introduction

The pursuit of eradicating poverty and fulfilling basic needs stands as a paramount objective for nations across the globe. Numerous institutions have committed themselves to the ambitious goal of ending poverty and destitution by 2030. The fight against extreme poverty and the enhancement of health and education represent key components of the Millennium Development Goals, as agreed upon by 189 heads of state in 2000. Since the pioneering works of Sen, poverty has been recognized as a multidimensional phenomenon. Consequently, employing multidimensional measurements emerges as a more responsible and reliable approach in most contexts (International Fund for Agricultural Development, 2009). The concept of the multidimensionality of poverty arises from the inherent limitations individuals face in defining poverty, which extends beyond mere

economic constraints to encompass various aspects of life (Bourguignon & Fields, 1997; Maleta, 2006; Castro, 2010). The Sustainable Development Goals (SDGs) specifically acknowledge poverty as a multidimensional feature (Alkire, 2018), prompting the development of several methodologies to address this issue. One such example is the Alkire-Foster method, widely utilized globally (Alkire & Foster, 2011), which has been adopted nationally by numerous bodies for calculating the Multidimensional Poverty Index (MPI) tailored to different regions, sub-regions, groups, and sub-groups.

Household headship serves as a valuable indicator for identifying impoverished households worldwide. The relationship between gender and poverty is intricate, both conceptually and empirically, primarily due to the absence of a single, universal definition. While the most commonly applied approach to measuring

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poverty revolves around economic well-being, it offers limited insights into the analysis of gender and poverty dynamics.

The concept of the feminization of poverty, introduced by Pearce in 1976, has underscored the significance of gender in poverty studies. In many countries, women face exclusion from the labor market. Consequently, when lacking male support for their families, these women encounter challenges accessing social insurance benefits. Factors such as weak social networks (Kim, 2007), changes in family structure due to divorce or the death of a spouse (Kim, 2004), sexual division of labor ideology, and labor market segmentation (Lee, 2005) are often cited as contributors to poverty among female household heads.

Globally, statistics reveal stark gender disparities in poverty rates. For instance, there are 122 women aged 25-34 living in extreme poverty for every 100 men in the same age group. The prevalence of extreme poverty is slightly higher in the Sub-Saharan Africa region, where 127 women aged 25-34 live in extreme poverty for every 100 men. Furthermore, in nearly two-thirds of countries, women are more likely than men to report food insecurity. Adolescent girls are also more likely to be out of school than adolescent boys, while women and girls primarily bear the burden of water collection and rely on unclean fuels for cooking and heating, with detrimental effects on their health and that of their children.

Numerous studies have examined the relationship between household headship and poverty. While some research indicates that households headed by women tend to be poorer (Chant, 2008; Rogan, 2013; Caitlin & Dominique, 2020), others have contested these findings (Lampietti & Stalker, 2000; Quisumbing et al., 2001; Munoz-Boudet et al., 2018).

In Sudan, poverty affects over a third of its population, with 18.3% of the population in Gezira State—where this study is situated—living below the poverty line. Additionally, the poverty gap ratio (depth) stands at 1.1%, with a poverty gap (severity) of 2.7%, according to the African Development Bank Group (2018). The Oxford Poverty and Human Development Initiative (2020) assesses the national MPI for Sudan at 0.279 and for Al Gezira State at 0.167. Sudanese women play a significant role in the household economy, engaging in both formal and informal work across rural and urban areas, including agricultural labor and handicraft production. However, they often face barriers to education, employment, and land ownership

due to cultural norms and structural inequalities (Interim Constitution, 2005).

The significance of this study lies in addressing the substantial gender data gap and the lack of trend data, which hampers efforts to assess and monitor progress for women. In Sudan, data availability remains limited, contributing to persisting gender data scarcities despite efforts to mainstream gender into national statistical strategies. To bridge this gap, this study seeks to investigate the economic and socio-economic characteristics of household headship in Al Manqil Locality, contributing to the existing literature on poverty reduction and serving as a guide for empowering women. The research aims to answer key questions: Is household gender a useful indicator for monitoring poverty levels? Which groups are most deprived? What factors are associated with household deprivation in Al Manqil Locality? And what is the primary contributor to multidimensional poverty? Additionally, it seeks to examine how unbalanced development leads to disparities among sub-regions and sub-groups.

To measure multidimensional poverty, this study employs the Alkire-Foster measure, building upon the Foster, Greer, and Thorbecke (FGT) index (Foster et al., 1984) to construct the Multidimensional Poverty Index (MPI) in Al Manqil Locality, focusing primarily on gender-based household headship.

The rationale for examining poverty through a multidimensional lens stems from its varied manifestations of deprivation across essential aspects of life. Multidimensional methods provide a nuanced understanding of poverty, offering insights into how it is experienced and perceived (Alkire & Foster, 2011). The primary objective of this study is to calculate the MPI for households headed by males and females in Al Manqil Locality based on primary data compiled by the Central Bureau of Statistics (CBS) on poverty-related indicators for the year 2023. Specific objectives include comparing the incidence of poverty across male- and female-headed households, analyzing poverty decompositions by urban and rural locations, and assessing the contribution of various factors to the MPI.

To achieve these objectives, the study sets out to test the validity of several working hypotheses: 1) females in the study area experience multiple deprivations; 2) development in Al Manqil Locality is unevenly distributed; 3) MPI is lower in urban areas compared to rural areas; and 4) income poverty is the primary contributor to MPI.

The remainder of this paper is structured as follows: Section 2 provides a review of background information on Sudan's multidimensional poverty and gender profile, while Section 3 outlines the methodology and describes the data and sample selection. Section 4 presents the empirical results, followed by a discussion of the conclusions and policy implications in Section 5.

2. Literature Review

2.1. Multidimensional Poverty in Sudan

Sudan, one of the largest countries in Africa, underwent significant changes, particularly following the separation of the southern part in 2010. The northern region predominantly comprises the Sahara Desert, while the central area transitions from dry Savannah to tropical forest along its boundary with the southern region. Bordered by nine countries, Sudan faces diverse socio-economic conditions. Balloon & Duclos (2015) highlighted substantial disparities in measuring multidimensional poverty across states and sub-groups within Sudan. The African Development Bank Group (2018) estimated Sudan's poverty prevalence at 36.1%, with approximately 25% of its population living in extreme poverty.

According to the Oxford Poverty and Human Development Initiative (2020), Sudan's global Multidimensional Poverty Index (MPI) stands at 0.279, with further breakdowns indicating MPIs of 0.122 for urban areas and 0.351 for rural areas. A recent study by Mohamed & Hysum (2021) assessed multidimensional poverty in Gedaref State, revealing that 47% of its population experiences multidimensional poverty.

Sudan's economy has undergone limited structural transformation, remaining largely dependent on agriculture, non-wage work, and informal wage labor (Etang Ndip and Lange, 2019; Ebaidalla and Nour, 2021). Self-employment constitutes a significant portion of employment, with 16% in agriculture and 13% in non-agricultural sectors. Additionally, 6% of workers are employers, while unpaid family work is prevalent in agriculture (9%) but rare in non-agricultural sectors (1%). Informal wage work is substantial, comprising 10% in agriculture and 30% in non-agricultural industries. Despite variations, agriculture still accounts for 39% of employment, which could rise under alternative definitions beyond current market employment. Formal private sector wage work (1%) and public enterprise work (1%) are minimal, but government employment constitutes 13% of the workforce (Krafft et al., 2023).

2.2. Gender Profile

Women constitute nearly 50% of Sudan's population, as reported by the Japan International Cooperation Agency (2012). Despite their significant societal presence, women in Sudan face precarious socio-economic circumstances. Historically marginalized economically, socially, and politically, many women lack access to essential services such as healthcare and education, particularly in rural areas. Additionally, they encounter barriers to land ownership, credit, and agricultural resources, despite their heavy involvement in agricultural activities.

While the Interim Constitution (2005) enshrines gender equality in various domains, legal protections for women's rights are not consistently enforced. Compounded by ongoing conflicts, poverty, and cultural factors, these challenges persist. Gender roles in Sudan typically adhere to traditional norms, with men assuming leadership roles within households. However, variations exist across tribes and regions. Women, burdened with domestic responsibilities and limited opportunities, often engage in income-generating activities to support their families.

Approximately 28% of Sudanese households are headed by women, with rural areas exhibiting the highest proportion. Although Sudanese women have made strides in recent decades, gender disparities persist in certain spheres of society (Elgali, 2019).

Sudan's economy and labor market encounter numerous challenges. Long-standing issues such as demographic pressures on labor supply, enrollment difficulties, and gender inequality in participation may have been exacerbated by the decade of crises (Caroline et al., 2023).

3. Methodology

3.1. The MPI Concept

The consensus on poverty as a multidimensional concept has led many researchers to adopt the approach developed by Alkire-Foster, which is widely utilized globally (Alkire & Foster, 2011). Organizations such as the Oxford Poverty and Human Development Initiative (OPHI) and the United Nations Development Programme (UNDP) employ this approach to calculate the Multidimensional Poverty Index (MPI) for cross-country comparisons and to inform poverty reduction policies. The World Bank also utilizes this method for specific multidimensional poverty measures (World Bank, 2017). Additionally, some countries have developed their own national MPIs to tailor the technique to their unique contexts and priorities.

3.2. Aggregation Stage

The MPI consists of three dimensions comprising ten indicators, each associated with a minimum level of satisfaction, known as a deprivation cut-off, based on international standards such as the Millennium Development Goals (MDGs). The MPI calculation involves two steps. First, each person is assessed based on household achievements to determine if they fall below the deprivation cut-off for each indicator. Second, the weighted deprivations of each person are summed, and if the total weighted deprivations amount to 33% or more of possible deprivations, the person is considered multidimensionally poor.

3.3. MPI Mathematical Structure

The MPI comprises ten indicators, including two for education, two for health, and six for living standards. These indicators were selected through a consultative process involving experts in all three dimensions. The

poverty headcount (H) measures the percentage of people who are poor, while the Average Intensity of deprivation (A) reflects the proportion of dimensions in which households are deprived. The MPI is a product of both H and A, denoted as $M_o = HA$.

The three dimensions are equally weighted, so that each of them receives 1/3 weight (see Table 1 for details).

The MPI of X given deprivation cut-off vector z , poverty cut-off k and weight vector w is:

$$MPI(X) = \frac{1}{n} \sum_{i=1}^n ci(k) = \frac{q}{n} \times \frac{1}{q} \sum_{i=1}^n ci(k) = H \times A \quad (1)$$

Where: q is the number of poor, for those whose deprivation score is below the poverty cut-off, even if it is non-zero, this is replaced by “0”, what we call censoring in poverty measurement (see Table 2 for definitions of cut-off). The multidimensional headcount ratio (H), also frequently known as the

Table 1. MPI dimensions, indicators and weights

Dimension	Indicator	Poverty cut-off	Related to...	Weight
Education (1/3)	Years of education (1/6)	No member of the household has done 6 years of education.	MDG2	16.67%
	Child staffing (1/6)	Any child school-age is out of school in years 1-86.		16.67%
Health (1/3)	Food (1/6)	Any child or adult for whom there is nutritional data is undernourished.	MDG4	16.67%
	Child mortality (1/6)	One child at least has died in the household in the last 5 years.	MDG1	16.67%
Standard of living (1/3)	Electrical energy (1/18)	The family has no electrical energy.	-	5.56%
	Better hygiene (1/18)	The family’s hygiene ability is not better or it is public.	MDG2	5.56%
	Better-quality drinking water (1/18)	The family does not have access to better drinking water, waking up 30 minutes from home-based, roundtrip.	MDG7	5.56%
	Flooring (1/18)	The household’s ground is dirty, sandy or dunging.	-	5.56%
	Cooking gas (1/18)	The family cooks with charcoal, wood or dung.	MDG7	5.56%
	Assets (1/18)	The family does not own one of: receiver, TV, phone, bicycle, motorcycle or freezer or does not own a car or tractor.	MDG7	5.56%

Table 2. Definitions of cut-off points for each MPI dimension employed by the empirical model

No.	Dimension	Cut-off points
1	School enrolment	At least one child, age 6 and above, is not currently enrolled in school.
2	School attendance	No household member has completed 6 years of schooling.
3	Child mortality	Any child has died in the family in the last 5 years.
4	Food security	There was not enough food or money for food in the past 7 days.
5	Overcrowding	Household lives with 4 members and above.
6	Electricity	Household not electrified.
7	Cooking gas	The household cooks with dung, wood or charcoal.
8	Sanitation	If the household doesn’t use a flush toilet, unimproved latrine, pit or shared.
9	Safe drinking water	If the water source piped outside the house.
10	Work of headship	The head of household has not monthly salary or does not have owned at least 2 acres to farms.

poverty incidence, which is the fraction of the population identified as multi-dimensionally poor. It is simply given by:

$$H = \frac{\sum_{i=1}^n p_i^k(x_i; z)}{n} = \frac{q}{n} \quad (2)$$

The average deprivation shares across the poor, that is, the average fraction of dimensions in which the poor are deprived. This is also called the intensity (or breadth) of poverty (A). It is the average deprivation score of the multi-dimensionally poor people and can be expressed as:

$$A = \frac{\sum_{i=1}^n c_i(k)}{qd} \quad (3)$$

Where: $c_i(k)$ is the censored deprivation scored of individual i and q is the number of people who are multi-dimensionally poor.

H and A can be easily combined into one single measure, called by the authors M_o , which is just the headcount ratio ‘adjusted’ (ie. multiplied) by breadth of poverty; $M_o = HA$, simply the MPI is a product of both:

$$MPI = H \times A \quad (4)$$

A person is identified as poor if he or she is deprived in at least one third of the weighted indicators. Noted that, all the M_o measures can be decomposed by population subgroups, one of our principal interests in this study is to understand sub-locality poverty. The MPI is helpful in this respect as it is subgroup decomposable. Let us denote the achievement matrix of subgroup ℓ by X^ℓ which has a population size of n^ℓ for all $\ell = 1, \dots, m$. Then we can express the overall MPI as:

$$MPI(X) = \sum_{\ell=1}^m \frac{n^\ell}{n} M(X^\ell) \quad (5)$$

The share of subgroup ℓ to the overall poverty is given by

$$(n^\ell/n) \times [MPI(X^\ell)/MPI(X)] \quad (6)$$

For our consideration urban and rural populations for n_1 and n_2 , the two subgroups are respectively presented by two matrices of achievements x_1 and x_2 . Then we have:

$$MPI(x; z) = \frac{n_1}{n} MPI(x_1; z) + \frac{n_2}{n} MPI(x_2; z) \quad (7)$$

3.4. Components of the MPI

The MPI’s components include indicators for schooling, health, and living standards. For schooling, the MPI considers indicators such as years of schooling completed by household members and school attendance of children. Health indicators include food security and child mortality, while living standards indicators encompass access to basic services and ownership of consumer goods.

Schooling: The MPI incorporates two indicators to assess the schooling dimension, ensuring a balanced evaluation. One indicator focuses on the completed years of schooling of family members, while the other examines school attendance among children. Years of schooling serve as a proxy for the level of knowledge and understanding within the household. The deprivation cut-offs for this dimension stipulate that at least one member of the household must have completed five years of education, and all school-aged children must be attending grades 1 to 6. It’s noteworthy that in constructing this indicator, occasional discrepancies may arise. For instance, a household member may be considered non-deprived if they have at least five years of education, even if they are not formally educated. Conversely, a household with at least one school-aged child not attending school may be deemed deprived, even if that child has completed schooling. Similarly, households without school-aged children may still be considered non-deprived in terms of school attendance. Thus, the deficiency rate in this indicator offers insights into the demographic structure of families and nations, as well as their educational achievements.

Health: The MPI includes two health indicators: access to sufficient food for family members and the prevalence of malnutrition among adults or children. A child is deemed underweight if their weight falls two or more standard deviations below the median of a reference population. It’s important to note that the global MPI does not categorize adults or children as poor in nutrition solely based on being overweight, unless they are malnourished. For the purposes of this research, food security is defined as lacking adequate food or the financial means to acquire food over the past seven days. The second health indicator utilizes data on child mortality. Typically, child deaths are preventable and often caused by infectious diseases or diarrhoea. Child malnutrition is also a contributing factor. In the MPI, any household member who has experienced at least one observed child death, regardless of the child’s age, is considered deprived in this indicator. It’s crucial to recognize that this indicator differs from standard mortality statistics.

Living Standards: This indicator provides fundamental insights into the quality of housing within households. It encompasses access to better-quality drinking water, improved hygiene facilities, clean cooking gas, access to electricity, and flooring material. Additionally, it includes ownership of consumer goods such as a radio, TV, phone, bicycle, motorcycle, freezer, car, or

tractor. The cut-offs for each item can be determined based on the specific context of the country under study. The assets index of the MPI utilizes relative cut-offs rather than absolute ones, making it challenging for direct comparisons across countries or over time. Furthermore, constructing the assets index faces difficulties due to the lack of information on asset prices, quality, or age in survey data. Certainly, all the living standard indicators serve as means rather than ends, and some common classifications have been identified:

Water: Access to water for family needs excludes vendor-provided water, tanker trucks, or unprotected wells and springs. If the water source is piped water, a public tap, borehole, pump, protected well, protected spring, or rainwater, and it is within a distance of 30 minutes' walk (round-trip), a family is considered not deprived in terms of drinking water. Failure to meet these conditions results in the household being considered deprived of access to water.

Hygiene: A household is considered to have access to improved hygiene if it has some type of flush toilet, latrine, or ventilated improved pit or composting toilet, provided that they are not shared. Otherwise, it is considered deprived of hygiene.

Electrical energy: Lack of access to electricity indicates deprivation in this area.

Overcrowding: If there are at least four members per room, the household is considered overcrowded.

Cooking gas: A household is deemed deprived of cooking gas if it lacks access to gas and instead cooks with dung, charcoal, or wood.

Employment: If a female head of the household does not have a monthly salary or does not own at least 2 acres of land for farming, each person in the household is considered deprived in terms of employment.

3.5. Data

This study aims to examine the relationship between the gender of household headship and multidimensional poverty in Al Manqil Locality, serving as a case study within Gezira State. The analysis relies on primary data on education, health, and standard of living to test various hypotheses related to the study's objectives, covering the entire locality, including its five administrative units.

Gezira State spans a total area of 27,549 km² with a population size of approximately 4.2 million, comprising 48% males and 52% females, residing

in 625,543 households, with an average size of 6 persons according to CBS (2015). Gezira State is the second most populous after Khartoum state, constituting about 9.1% of the total population of Sudan. Administratively, the state is organized into 8 localities, namely: AlManaqil, Greater Wad Medani, AlHasaheisa, Janob AlJezira, Sharg AlJezira, AlKamlin, Um AlQoura, and 24-AlQurashi. Each locality consists of several administrative units, which are similar in terms of demographic characteristics and economic activities. Al Manqil Locality alone is organized into five administrative units: AlManaqil AlMadina, AlKirieimit, AlHuda, Rifi AlManaqil, and Algamoos.

The rationale behind selecting Al Manqil Locality as the data source is threefold. First, in this locality, only female-headed households, either divorced or widowed, exist due to the customs of the region, which do not allow the wife to head the family while her husband is alive. Second, according to CBS (2015), the distribution of households headed by males or females is nearly equal, with 48.22% in urban areas compared to 51.78% residing in rural areas. Additionally, the proportion of households headed by females is close to 53% in urban areas and 47% in rural areas. Third, the locality is home to a third of Gezira State's population, comprising about 220,470 households.

3.6. Sample Size

Al Manqil Locality constitutes the main sampling domain. In each of the administrative units, a two-stage cluster sampling design is employed to draw the sample for the study's purposes. The clusters are distributed to urban and rural areas in proportion to the size of the urban and rural populations in these administrative units. Villages in rural areas and blocks across towns in urban areas constitute the primary sampling unit. Urban and rural clusters in each administrative unit are randomly selected with a probability of selection proportional to size.

The sample excludes the nomadic population due to a lack of a proper sampling frame and accessibility issues. Additionally, institutional households, camps, and homeless segments of the population are excluded. This represents the first stage of sampling.

The second stage involves listing all households headed by females within the selected sample unit to ensure randomness and representativeness, as well as to provide good geographic coverage. The sample size of households is determined according to the Richard Geiger equation.

3.7. Questionnaire

A single survey was administered to households using a structured questionnaire with the head of households or other knowledgeable members representing them. The questionnaire administration was cross-sectional in nature, delving into households' economic, social, and demographic data. The study adopted form modules designed by an expert team from the Oxford Poverty and Human Development Initiative for computing the MPI for developing countries. The data collected were associated with CBS, Gezira State, and were administered to take approximately 30 minutes per household.

Overall time management was left to the enumerator staff, as several factors determined how many villages and blocks could be surveyed per day, depending on the distances between houses. All respondents were in good health and aged between 25-60 years old, which is the working age according to Sudanese labor law.

The questionnaire is divided into two main sections. Section (1) is at the top of the household questionnaire, collecting basic demographic data about the survey respondent and the head of the household. These data are valuable in providing a quick overview of the respondents' characteristics and households in the randomly sampled population, helping to better understand the nature of the collected data.

Questions in this section pertain to variables such as the head of the household's age and gender, respondent's age and gender, and marital status of the head of the household. Section (2) is meant to collect data on the household's income by source. Section (3) relates to information on the household's expenditure by item, including expenditure on food, housing, source of fuel, clothing, education, and medical treatment. Section (4) is devoted to questions related to some poverty correlates, including house characteristics such as tenure status, type of cooking fuel, type of lighting,

and source of drinking water. Section (5) includes questions related to the ownership of valuable assets, which may provide information on variables other than income and expenditure that could influence households' standard of living.

Fieldwork began on March 20 and continued until April 10, 2023, with about 12 enumerators divided into 4 groups employed to collect data from the households identified for this study under the supervision of the director of CBS in Gezira State.

3.8. Data Coding and Processing

To ensure the accuracy and quality control of the data, it was entered using Excel Sheet Files. Ten percent from each cluster was randomly selected to check the accuracy of the entered data. The data from the study were then processed using the Statistical Package for Social Science (SPSS), and all data were recorded into numerical codes according to the poverty cut-off settled, as shown in Table 3.

All villages and blocks were organized under their respective administrative units. Similarly, each administrative unit was organized under its locality, and then urban/rural data were organized for the purposes of the study. This systematic organization allowed for efficient data analysis and interpretation, facilitating the extraction of meaningful insights from the collected data.

4. Results and Discussions

The study interviewed a total of 764 household heads in Al Manqil Locality across five administrative units, estimating the Multidimensional Poverty Index (MPI) using 10 indicators across 3 dimensions. The findings revealed that approximately 48.44% of female-headed households experienced multidimensional poverty, with deprivation in at least one-third of the education, health, and standard of living dimensions. This rate was higher compared to households headed

Table 3. Binary scoring indicators/ poverty cut-off

Indicator	Definition of indicator
School enrolment	1 if at least one child, age 6 and above, is not currently enrolled in school; 0 otherwise.
School attendance	1 if no household member age 6 and above has completed 6 years of schooling; 0 otherwise.
Food security	1 if there was not enough food or money for food in the past 7 days; 0 otherwise.
Child mortality	1 if at least one child has died within the household during last 5 years; 0 otherwise.
Overcrowding	1 if 4 members of household per room; 0 otherwise.
Electricity	1 if the house is not electrified; 0 otherwise.
Cooking gas	1 if the household has no gas for cooking; 0 otherwise.
Sanitation	1 if the household doesn't use a flush toilet or shared; 0 otherwise.
Safe drinking water	1 if the water source piped outside the house; 0 otherwise.
Work of headship	1 if the household doesn't have monthly salary or at least 2 acres to farm; 0 otherwise.

by males, which stood at 41.14%. These results support the validity of the first hypothesis, indicating a higher prevalence of poverty among female-headed households in the study area.

The standard of living emerged as the primary contributor to poverty, with about 38.94% of female-headed households deprived across six indicators within this dimension. Health and education dimensions accounted for 32.88% and 28.18% of MPI, respectively. Similarly, 41.14% of households headed by males were multidimensionally poor, with the highest deprivation observed in the standard of living dimension (57.66%), followed by health (31.69%) and education (10.65%). Although male-headed households fared slightly better, the majority still faced deprivation in meeting basic needs due to insufficient monthly income or limited access to agricultural land.

Significant differences in poverty across dimensions were observed between the two groups. Female-headed households were more likely to experience overcrowding, with 11.82% living in households with at least four members per room, compared to 12.91% for male-headed households. Access to electricity and clean cooking gas was better in female-headed households, while male-headed households experienced higher rates of inadequate hygiene facilities. Child mortality contributed significantly to poverty among female-headed households, indicating that the poverty experienced by females often extends to their children.

In terms of education, female-headed households faced challenges with school attendance, with an estimated illiteracy rate of 20.07%. In contrast, male-headed households experienced worse nutrition

outcomes. However, both groups exhibited high deprivation levels in the health dimension, with rates of 39.94% and 33.88% for female and male-headed households, respectively, Table 4 shows the details and Figure 1 presents the contribution of deprivation in each dimension to overall MPI.

The analysis of sub-regions, including urban and rural areas, revealed consistent findings across both groups, with female-headed households experiencing higher levels of poverty than male-headed households in both settings. Additionally, rural areas exhibited higher poverty levels compared to urban areas for both groups, with deprivation being concentrated across all dimensions, Figure 2 and 3 present the details.

These findings align with previous studies, which have highlighted the vulnerability of females to extreme poverty due to factors such as unpaid work burdens, limited assets, lower earnings, and employment in lower-income sectors. The rural-urban disparity in poverty underscores the importance of addressing employment opportunities and access to services for women’s economic empowerment and overall household well-being (Shin, 2010; SNHDR, 2012; Tønnessen, 2019; Amlaksetegn et al., 2020).

In conclusion, the findings shed light on the complex nature of poverty dynamics within Al Manqil Locality, emphasizing the need for targeted interventions to address the specific challenges faced by female-headed households, particularly in rural areas. By addressing underlying factors contributing to multidimensional poverty, such as access to education, healthcare, and economic opportunities, policymakers can work towards reducing poverty and promoting inclusive development in the region.

Table 4. MPI indicators of deprivation for household headship of the Al Manqil Locality

Domain	Dimension	Values of indicators	
		Male-headed	Female-headed
Education	Children age 6-14 not attending school	6.11	8.11
	Population not completed 6 years of schooling	4.54	20.07
Health	Population malnourished	19.8	13.05
	Families with at least one death under 5 years	11.89	19.83
Standard of living	Households with overcrowded	12.91	11.82
	Households with no electricity	9.67	1.64
	Households cooking with wood or charcoal	6.33	1.11
	Households with no sanitation	5.93	10.23
	Households with no safe drinking water	4.04	7.35
	Households without salary or 2 acres	18.78	6.79
Total MPI		41.14	48.44

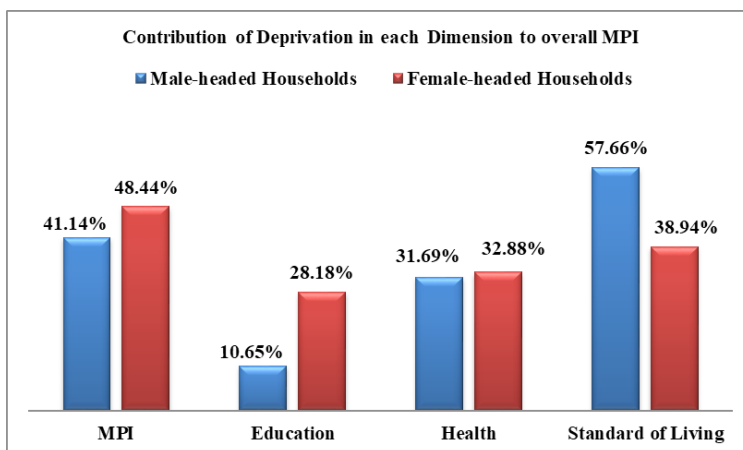


Figure 1. Contribution of deprivation in each dimension to overall MPI

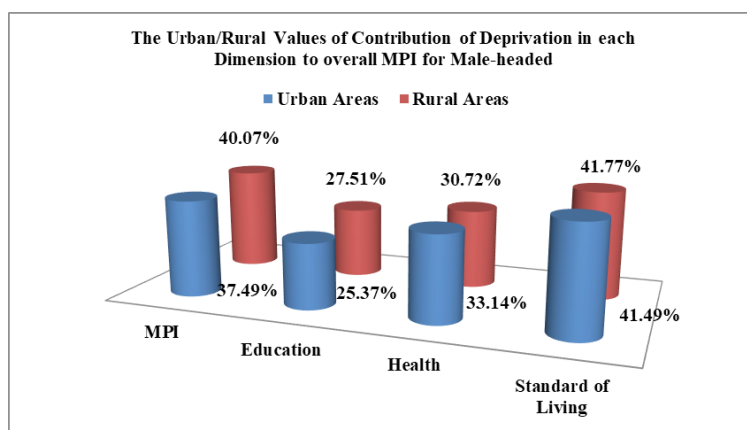


Figure 2. Urban/rural values of contribution of dimensions' deprivation to overall MPI for male-headed

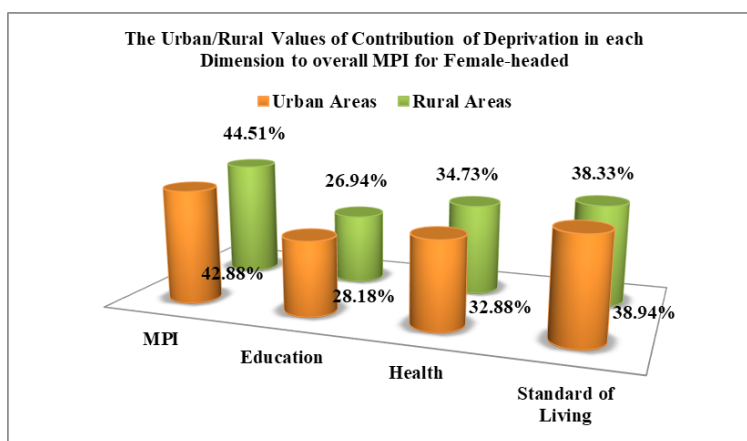


Figure 3. Urban/rural values of contribution of dimensions' deprivation to overall MPI for female-headed

5. Conclusion

The study conducted in Al Manqil Locality sheds light on the persistent issue of multidimensional poverty, with a focus on the gender of household headship. Poverty alleviation remains a critical development objective in Sudan, and understanding its dynamics, particularly concerning household headship, is essential for sustainable development in the region.

Utilizing the Alkire-Foster model, which comprises 10 components, the study analyzed primary data collected through structured questionnaires administered by

the Central Bureau of Statistics in 2023. Fieldwork covered six administrative units, with a total of 764 households randomly selected for analysis. The study examined poverty across urban and rural areas, distinguishing between male-headed and female-headed households.

The findings revealed that approximately 48.44% of female-headed households experience multidimensional poverty, exceeding the rate among male-headed households by 7.3%. Moreover, rural areas exhibited higher levels of multidimensional

poverty compared to urban areas, with deprivation evident across all dimensions. The standard of living emerged as the primary contributor to poverty, emphasizing the importance of addressing economic disparities within households.

In conclusion, the study underscores the significance of household headship in understanding and addressing poverty dynamics. By recognizing the differential impacts of poverty based on gender and location, policymakers can develop targeted interventions aimed at improving the well-being of vulnerable households, particularly in rural areas. Efforts to enhance access to education, healthcare, and economic opportunities are essential for reducing poverty and promoting inclusive development in Al Manqil Locality and beyond.

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