

MULTIDIMENSIONAL POVERTY AMONG FARMING HOUSEHOLDS IN KATSINA STATE, NORTHWESTERN NIGERIA

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Abstract. This study aimed to determine the multidimensional poverty status of farming households in Katsina state, northwestern Nigeria. A multi-stage sampling technique was used to elicit primary data from 480 farming households. Descriptive statistics and the multidimensional poverty assessment tool (MPAT-14) were used to analyze the data. The socio-demographic analysis showed that the mean age of respondents was 43 years while the average household size was 9 persons. The majority (86%) of respondents were male, and they were mostly married (85%) and educated (51.3%). The MPAT results showed that farmers in the study area experienced a high level of deprivation according to the majority of the fundamental human needs indicators, such as food and nutrition security (27.7%), domestic water supply (28.9%), health care (22.9%), sanitation and hygiene (28.1%), housing, clothing, and energy (33.9%), and education (27.7%). The results indicate that the majority (60.6%) of the households are living in multidimensional poverty and that there is a higher level of multidimensional poverty among farming households. The government should upscale appropriate healthcare delivery systems to improve the healthcare services rendered.

Keywords: Mpat-14, deprivation, food, sanitation, education

INTRODUCTION

Extreme poverty is a threat to nations in Sub-Saharan Africa, half of whose poor live in just five Sub-Saharan African economies: Nigeria, the Democratic Republic of Congo, Tanzania Ethiopia and Madagascar, each of which has a population of over 20 million poor (Schoch and Lakner, 2020). The National Bureau of Statistics (NBS, 2019) has revealed that about 83 million people, or about 40% of Nigeria's total population, live below the World Bank's income poverty line, \$361 per year and \$11 per day. Furthermore, according to the Brookings Institute, six Nigerians fall into poverty every minute (Emele et al., 2019).

According to the 2019 Global Multidimensional Poverty Index (MPI), Nigeria's multidimensional poverty rate is 51.4 per cent, indicating that more than half of the population does not have at least one of its 10 basic needs met (the basic needs are: nutrition, infant mortality, sanitation, education, school attendance, drinking water, housing, property, electricity, cooking fuel). However, there are regional differences, with northern states experiencing higher levels of multidimensional poverty than southern states (NBS, 2019).

An analysis of multidimensional poverty level by zone showed that the northeast (76.5%) and northwest (75.8%) were the regions with the highest incidence of multidimensional poverty and contributed more to

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the high level of multidimensional poverty in Nigeria (NBS, 2022). Available statistics indicate that each state has a multidimensional poverty level of more than 40.1% (NBS, 2017).

Nigeria's multidimensional poverty level has remained stubbornly high over the last decade, with no significant progress made in reducing poverty levels. A recent study conducted by the National Bureau of Statistics in 2022 on the multidimensional poverty level of Nigeria's states revealed that sixty-three per cent (63 per cent) of Nigerians are poor because of a lack of access to health, education, living standards, employment and security. The report also revealed that poverty is more widespread among rural residents and rural communities where infrastructure and social services are insufficient. This alarming poverty level implies that the majority of youths will become vulnerable to social and economic vices such as banditry and kidnapping as a result of the menace of extreme poverty and the need to survive and find a livelihood. Furthermore, extreme poverty can indirectly affect the food system and distort food production and supplies. In the long run, this may result in a food emergency, which could spell doom for the country as a whole.

Several studies on poverty have been conducted in Nigeria using the unidimensional (monetary and income/consumption) approach (Olatomide, 2012; Azeez et al., 2015; Ogunniyi et. al., 2019). Recent studies on multidimensional poverty in Nigeria (Sulaimon and Dele, 2020; Olarinde et al., 2020; Amurtiya et al., 2019; Oyekale et al., 2019; Tiri et al., 2019; Adepoju, 2018; Hama and Lisicka, 2013; Ologbon et al., 2014; Adeoti, 2014; Ifelunini et al., 2013) have used the multidimensional poverty index (MPI). The main disadvantage of the MPI is its complexity. It combines several dimensions of poverty into a single index, which could lead to the loss of vital information and make it difficult for policymakers to interpret the results and formulate policies. To bridge this knowledge gap and contribute to the body of literature, this study adopted the Multidimensional Poverty Assessment Tool (MPAT) proposed by the International Fund for Agricultural Development (IFAD). The MPAT enables a detailed assessment of the nature and the causes of poverty. It gives a simpler and clearer understanding of poverty compared to the one-dimensional (MPI), and its dimensions scores can be calculated separately as thematic indicators.

This multidimensional approach was adopted in the current study to better elucidate the underlying causes of poverty and help the authors provide relevant policy recommendations to combat poverty. The study's specific objectives were to describe the socio-demographic characteristics of respondents and to determine their multidimensional poverty status.

METHODOLOGY AND DATA SET

Katsina state is located at a latitude of 11° 00'N to 13° 25'N and a longitude of 6° 45'E to 9° 05'E. It is in Northwest Nigeria. Katsina state covers an area of about 24,192 km² and has two different climate seasons, namely the dry season and the rainy season. The rainy season covers the period from May to September, and the dry season covers about seven months of the year between October and April. Vegetation extends from tropical lands known as the Sudan savannah to the arid zone of the north. Due to its border with the Sahel region, the state's vegetation density decreases from the southern part of the state to the northern part. The state consists of three agricultural areas, namely Ajiwa, Funtua and Dutsin-ma. (Katsina State Investment Handbook, 2016). It has an estimated population of 5.8 million, mainly in rural areas, and they were mainly engaged in agricultural activities in 2006 (NPC, 2006).

A multi-stage sampling technique was used to sample respondents for this study. In the first stage, three local government areas were selected at random from

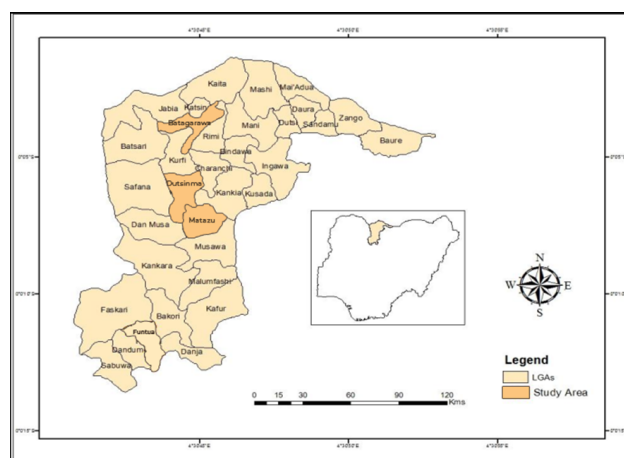


Fig. 1. Map of Katsina State
Source: Extracted from Abaje and Abdullahi (2016).

the three agricultural zones (Batagarawa, Matazu and Dutsin-ma local government areas). The recommended approach to using the MPAT tool according to IFAD (2014) is to select a sample size of 16 to 30 villages with 30 households per village. This approach was adopted in this study to ensure representativeness. Hence, in the second stage, sixteen villages were randomly selected across the three local government areas. In the third stage, thirty farming households were selected from each of the selected villages using the snowball sampling technique. This approach was used because the farming households could not be listed. Thus, a total of 480 households were selected for this study, which is quite representative of the population in the study area.

The study employed a combination of analytical tools to achieve its objectives. Descriptive statistics involving frequencies, means and percentages were used to describe the socio-demographic characteristics of the respondents and the relationship between their multidimensional poverty status and their socio-economic characteristics. The Multidimensional Poverty Analytical Tool (MPAT), as adopted from IFAD (2014), was used to determine the respondents' multidimensional poverty. The Pearson correlation test was used to examine relationships between the dimensions of poverty for this study.

The Multidimensional Poverty Assessment Tool uses a comprehensive and careful design with an established survey to collect data on all indicators of human well-being (Cohen 2009; IFAD, 2014). Each indicator has a subcomponent made up of numerous survey items, and the value for each subcomponent is aggregated using a weighted arithmetic mean and converted to a scale of 10–100. In the current study, household scores were obtained for each subcomponent.

According to the UNDP and OPHI standard poverty cut-off of 1/3 of dimensions, which was adopted for this study, households with cumulative average scores higher than the cut-off point of 33.33% of the weighted indicator are considered to be living in multidimensional poverty.

The weighted arithmetic average formula as used by IFAD (2014) is:

$$Y_{jk} = \sum_{i=1}^n W_{ik} X_{ijk} \quad (1)$$

where Y_{jk} is the household score j in subcomponent k ,

W_{ik} is the weight of the i th question in subcomponent k of the survey,

X_{ijk} is the scaled score of the household for question i of subcomponent k .

Therefore, $\sum_{i=1}^n W_{ik} = 1$ and $0 \leq W_{ik} \leq 1$.

These subcomponent scores were then aggregated using a weighted geometric average to calculate the main component score. The weighted geometric average formula is:

$$y_{ik} = \prod_{i=1}^n X_{ijk}^{w_{ik}} \quad (2)$$

where Y_{ik} is the household score j in subcomponent k ,

W_{ik} is the weight of the i th question in subcomponent k , and

X_{ijk} is the scaled score of the household for question i of subcomponent k .

The thematic indicator of the Multidimensional Poverty Assessment Tool makes it suitable for use in determining the poverty status of farming households.

A major limitation of the study is the lack of comprehension of the concept of multidimensional poverty among some of the respondents. Furthermore, the study relied on observational data and cannot be generalized to other contexts or populations in Nigeria.

RESULTS AND DISCUSSION

Socio-demographic characteristics of respondents

The socio-demographic characteristics of the respondents are presented in Table 1:

The results reveal that most of the respondents are middle-aged and have an average age of 44. The distribution of respondents by gender shows that the majority (86%) are men and married with large households, with an average of nine persons per household. More than half (51.3%) of respondents are literate, while 48.7% had a non-formal education. The majority (68.7%) did not have formal credit, and 46.7% of respondents suffered from one form of illness or another during the survey period.

Multidimensional poverty deprivation of sampled household

The results in Table 2 reveal that farmers in the study areas experience a high level of deprivation according to the majority of the fundamental human needs indicators. They have low scores for food and nutrition

Table 1. Socio-demographic characteristics of respondents

Variable	Frequency	Percentage (%)
Age		
< 30	78	16.3
31–40	83	17.3
41–50	161	33.5
51–60	63	13.1
61 Above	95	19.8
Mean = 44		
Gender		
male	412	86
female	68	14
Marital status		
married	408	85
single	51	10.6
divorced	13	2.7
widowed	8	1.7
Household size (persons)		
1–5	113	23.5
6–10	168	35
11–15	144	30
16 and above	55	11.5
Mean = 9		
Educational level		
no-formal education	234	48.7
primary	145	30.2
secondary	59	12.3
tertiary	42	8.8
Access to credit		
yes	150	31.3
no	330	68.7
Health problem		
yes	224	46.7
no	256	53.3
Total	480	100

security, domestic water supply, health care, sanitation and hygiene, housing, clothing, and energy, and education. The highest level of deprivation was evident in health and health care service, with an average score of 22.9%. Poor health can contribute to farmers' multidimensional poverty status by reducing their ability to engage in income-generating activities, limiting their productivity and increasing healthcare costs. Farmers who suffer from chronic illnesses or disabilities may find it challenging to work long hours, which can result in reduced yields and income. Additionally, the cost of healthcare can quickly deplete a farmer's already limited resources, further exacerbating poverty (Amao et al., 2017; Amurtiya et al., 2019). The study further revealed a high level of food and nutrition deprivation, with an average score of 27.2%.

The study also revealed a high level of educational deprivation (an average score of 27.7%), which implies that educational attainment in the study area is poor due to limited access to educational institutions and the poor status of educational institutions. The respondents' poor socio-economic status forces them to stop their education. Education is essential to reduce multidimensional poverty among farmers, and farmers with higher levels of education are more likely to adopt modern farming techniques, access credit facilities and participate in training programs which result in increased productivity and income (Adeoti, 2014; Amurtiya et al., 2019).

Another component that provides evidence of high deprivation among the respondents is domestic water supply, with a mean score of 28.9%. This indicates that domestic water availability, access and quality in the study area are low, which explains why most farming households either buy water from truck pushers or fetch water from streams and dams during the dry season and utilize water harvesting during the rainy season. According to Cerio et al. (2019), access to quality water is a crucial aspect of human development, and lack of access can affect the health and well-being of farmers, leading to multidimensional poverty.

One component that reveals a worrisome level of deprivation is the respondents' exposure and resilience to shocks, which has a score of 32.2%. According to Agbaje et al. (2013), a sustainable reduction in poverty levels can only be achieved if people's vulnerability is effectively managed and reduced. The likelihood of a respondent falling into poverty and the severity of poverty

Table 2. Multidimensional score across households from the study area

Component	Sub-Component	Average	[min, max]	Average of the main component
Food and nutrition	Consumption	33.0	[10.0, 100.0]	27.7
	Access stability	25.7	[10.0, 100.0]	
	Nutrition quality	27.4	[11.5, 84.1]	
Domestic water supply	Quality	52.0	[30.8, 100.0]	28.9
	Availability	31.1	[10.0, 100.0]	
	Access	10.8	[10.0, 100.0]	
Health and health care	Health status	19.5	[10.0, 77.5]	22.9
	Access and affordability	31.6	[10.0, 100.0]	
	Quality	27.9	[18.0, 54.0]	
Sanitation and hygiene	Toilet facility	20.6	[10.0, 82.0]	28.1
	Household waste management	46.2	[24.0, 94.7]	
	Hygiene practices	29.7	[10.0, 100.0]	
Housing, clothing and energy	Housing structure quality	48.2	[38.0, 100.0]	33.9
	Clothing	21.5	[10.0, 100.0]	
	Energy	48.5	[10.0, 100.0]	
Education	Quality	20.8	[20.8, 20.8]	27.7
	Availability	25.0	[25.0, 25.0]	
	Access	43.2	[10.0, 100.0]	
Farm assets	Land tenure	33.6	[10.0, 85.0]	37.4
	Land quality	87.2	[10.0, 100.0]	
	Crop inputs	27.3	[13.8, 87.3]	
	Livestock/aquaculture inputs	30.3	[10.0, 89.3]	
Non-farm assets	Employment and skills	36.6	[25.0, 90.0]	41.2
	Financial services	59.1	[32.0, 88.0]	
	Fixed assets and remittances	34.7	[23.3, 86.7]	
Exposure and resilience to shocks	Degree of exposure	29.0	[10.0, 100.0]	32.2
	Coping ability	58.5	[15.0, 100.0]	
	Recovery ability	39.0	[10.0, 82.3]	
Gender and social equality	Access to education	33.0	[10.0, 100.0]	45.3
	Access to health care	57.0	[22.5, 100.0]	
	Social equality	57.0	[24.6, 71.1]	

Source: MPAT Result output 2021.

they will endure are greatly affected by their vulnerability. This is because an increase in exposure and risk/shocks reduces the ability of households to accumulate assets and income which can be invested into other key household needs (Amurtiya et al., 2019).

The component with the most disturbing score is the housing, clothing and energy component, with a mean score of 33.9%. This finding implies that most of the respondents live in houses built with inferior materials and have limited access to clothing that meets the required standards. Inadequate housing conditions such as overcrowding, poor house construction with inferior materials, and unhygienic environments can lead to health problems. A lack of access to modern energy sources such as electricity and clean cooking fuel can result in a reduction in productivity, which can further exacerbate poverty. This result is consistent with the findings of Cerio et al. (2019) who argue that housing and energy poverty is an important contributor to the multidimensional poverty of rural households in Nigeria.

Multidimensional poverty status of households sampled

Based on the magnitude of respondents' deprivation across the various indicators of poverty used in this study, the majority (60.6%) of households are multidimensionally poor, which aligns with a recent study by NBS (2022) that observed that multidimensional poverty in the study area is less than 90%, while across the country about 63% of Nigerians are multidimensionally poor. This finding also agrees with the submissions of Israel and Hakim (2015) who found that the majority of farming households in Oyo State, Nigeria were multidimensionally poor, with standard of living, consumption and education dimension having worrisome proportions.

Table 3. Multidimensional poverty status of the respondents

Multidimensional poverty status	Frequency	Percentage (%)
Multidimensional poor	291	60.6
Multidimensional non-poor	189	39.4
Total	480	100

Source: field survey, 2021.

Relationship between MDP and socio-economic characteristics of farming households

MDP profile by gender of household

The incidence of multidimensional poverty was higher among male-headed households than among female-headed households. This means that male-headed households have a higher incidence of multidimensional poverty compared to households headed by women. The difference between the incidence of multidimensional poverty in male- and female-headed households was significant at $p < 0.05$. A study by Amurtiya et al. (2019), observed that poverty is more widespread in female-headed households than in male-headed households in Nigeria.

Table 4. MDP profile by gender

Household gender	Multidimensional poor frequency (%)	Multidimensional non-poor frequency (%)	Total
Male	238 (50)	174 (36)	412
Female	53 (11)	15 (3)	68
Total	291	189	480

Source: field survey, 2021.

MDP profile by household age

The results on multidimensional poverty based on the age of household heads shows that respondents with ages less than 60 years had higher incidence of multidimensional poverty. The results suggests that even though individuals under 60 are typically in their productive years, they are still experiencing a high level of

Table 5. MDP by household age

Age of household	Multidimensional poor frequency (%)	Multidimensional non-poor frequency (%)	Total
< 30 years	55 (11)	23 (5)	78
31–60	177 (37)	130 (27)	307
61 and above	59 (12)	36 (8)	95
Total	291	189	480

Source: field survey, 2021.

multidimensional poverty. This contradicts the common assumption that younger individuals are more likely to be economically secure. The fact that the difference across age groups was not statistically significant ($p < 0.05$) implies that multidimensional poverty affects individuals across various age groups, highlighting the need for a comprehensive approach to address this issue.

The finding is not consistent with those of Adeoti (2014); Israel and Hakim (2015) and Ogunniyi and Aromolaran (2017), who observed that older farmers in Nigeria are more likely to be poor compared to younger farmers. The difference in the findings is simply because these studies focused on the unit directional measure of poverty using income but not the multidimensional measure of poverty in Nigeria.

MDP by household size

Several studies have shown that household size is one of the factors contributing to multidimensional poverty in rural Nigerian households (Anyanwu, 2010; Adekoya, 2014). Larger households may increase the risk of poverty because more people depend on limited resources such as land, labour, and income. The results show that multidimensional poverty was higher among agricultural households with more household members and more dependent relatives compared to smaller households. The variation in the incidence of multidimensional poverty across the various household sizes was significant at $p < 0.05$.

Table 6. MDP by household size

Age of household	Multidimensional poor frequency (%)	Multidimensional non-poor frequency (%)	Total
< 30 years	55 (11)	23 (5)	78
31–60	177 (37)	130 (27)	307
61 and above	59 (12)	36 (8)	95
Total	291	189	480

Source: field survey, 2021.

This result is consistent with those of Anyanwu (2010), Adekoya (2014), and Oyekale et al. (2019), who found that relatively large households are more likely to suffer higher levels of poverty.

MDP profile by educational level

Research has shown that education can be a powerful tool for reducing poverty, as it can lead to increased access to resources, better employment opportunities, and improved health outcomes. However, the relationship between a farmer's educational level and poverty is not straightforward, and there are many factors that can influence how education affects poverty among farmers. Suffice it to say that a farmer can be living in multidimensional poverty even when they have had a formal education, and this can be a result of a lack of access to credit. Land tenure rights and infrastructure can also play a critical role in determining the well-being of farming communities.

Table 7. MDP by educational level

Education status	Multidimensional poor frequency (%)	Multidimensional non-poor frequency (%)	Total
No formal education	217 (45)	17 (4)	234
Primary	41 (9)	104 (22)	145
Secondary	21 (4)	38 (8)	59
Tertiary	12 (3)	30 (5)	42
Total	291	189	480

Source: field survey, 2021.

The results in Table 8 show that there is a higher incidence of multidimensional poverty among farming households whose household head had no formal education. This finding agrees with those of Amao et al. (2017); Ogundipe et al. (2019), who found that education is an important factor in reducing poverty among farmers in Nigeria. Higher levels of education can lead to increased productivity and income, better access to social services, and improved living standards, all of which can help to alleviate poverty among farmers. The difference in the incidence of multidimensional poverty for different levels of education was significant at $p < 0.05$.

MDP profile by access to credit

Studies have shown that farmers' ability to access credit has a tendency to reduce multidimensional poverty.

However, in some cases individuals who are already experiencing poverty may have difficulty accessing credit because they lack the collateral or credit history necessary to secure loans. This can create a vicious cycle of poverty, where those who are already disadvantaged are unable to access the resources they need to escape poverty.

Table 8. MDP by access to credit

Access to credit	Multidimensional poor frequency (%)	Multidimensional non-poor frequency (%)	Total
Yes	29 (6)	121 (25)	150
No	262 (55)	68 (14)	330
Total	291	189	480

Source: field survey, 2021.

Among the respondents in this study, the majority of households without access to credit were living in multidimensional poverty. This finding agrees with the studies by Adepoju and Adejare (2013) and Amurtiya et al. (2019) that households with a better access to credit are less likely to suffer from multidimensional poverty. The difference between the incidence of poverty for households with access to credit and those without was significant at $p < 0.05$.

MDP profile by remittance received

Remittance received can improve the multidimensional poverty status of households by providing additional resources that can be used to improve various dimensions of poverty. For example, remittance can be used to pay for healthcare or education, acquire farm inputs or improve

Table 9. MDP by remittance received

Remittance received	Multidimensional poor frequency (%)	Multidimensional non-poor frequency (%)	Total
Yes	55 (12)	126 (26)	181
No	236 (49)	63 (13)	299
Total	291	189	480

Source: field survey, 2021.

the quality of housing and provide a safety net for households during periods of economic hardship, unemployment or illness. However, the impact of remittance on multidimensional poverty can also depend on how the remittance is used. If the remittance is not used efficiently – for example, if it is spent on non-essential items – it may not have a significant impact on poverty reduction.

The results in Table 9 show that multidimensional poverty was higher for households that do not receive remittances. This finding is in line with the submissions of Olatomide et al. (2013), which indicate that remittances have a positive impact on the reduction of poverty in rural farming families. In particular, those receiving remittances have improved access to education, health care and living standards compared to those not receiving remittances. The difference in the incidence of poverty between households that receive remittances and those that don't was significant at $p < 0.05$.

CONCLUSION AND RECOMMENDATION

There is a high level of multidimensional poverty among farming households in the study area. To reduce the level of multidimensional poverty in the study area, a review of current policies addressing health and health care, food and nutrition, education, sanitation, hygiene, and the domestic water supply in farming communities would be invaluable.

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