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IMPACT OF AGRICULTURAL OUTPUT ON POVERTY IN NIGERIA

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ABSTRACT

Persistent poverty amid rising agricultural output in Nigeria necessitates empirical investigation into whether agricultural growth has translated into meaningful improvements in multidimensional poverty condition. This study examines the impact of agricultural output on multidimensional poverty in Nigeria over the period 1982 to 2024, using the Human Development Index as a poverty-related indicator and the Autoregressive Distributed Lag (ARDL) bounds testing approach as the estimation technique. Real gross domestic product and labour-force participation rate were incorporated as control variables to account for broader macroeconomic and labour market conditions influencing poverty outcomes. The empirical findings reveal that agricultural output exerts a negative and significant effect on multidimensional poverty in the long-run, indicating that agricultural growth within the study period was structurally constrained and non-inclusive, failing to generate improvements in health outcomes, educational attainment, and living standards of the Nigerian population. In contrast, real gross domestic product and labour-force participation rate both exert positive and significant long-run effects on multidimensional poverty, confirming their roles as more effective drivers of human development in Nigeria. The study recommends a deliberate policy shift from mere output expansion toward inclusive agricultural productivity enhancement, rural value chain development, and broad-based macroeconomic strategies that ensure agricultural growth translates into sustained welfare improvements among rural households.

Keywords: Agricultural Output, Poverty, Multidimensional Poverty, Human Development Index
JEL Classification Code: *Q10, I32, O15*

1.0 Introduction

Agriculture remains one of the most important sectors of the Nigerian economy due to its significant contribution to food production, employment generation, rural development, and national income. According to the National Bureau of Statistics (2024), the agricultural sector contributed about 24.64% to Nigeria's Gross Domestic Product (GDP) in the fourth quarter of 2024, thereby making it one of the largest productive sectors of the economy. The sector also employs one-third of the workforce particularly in rural areas where poverty is most prevalence. According to the World Bank (2024), agriculture remains a major source of livelihood for millions of Nigerians through crop production, livestock farming, forestry, and fisheries.

Despite the strategic importance of agricultural output to the Nigerian economy, poverty remains widespread across the country. The National Bureau of Statistics (2022) reported that about 63% of Nigerians representing approximately 133.15 million people are multidimensionally poor. This is further corroborated by Nigeria's Human Development

Index (HDI) score of 0.548 recorded in 2023, which places the country in the low human development category and signals deep deprivation across the health, education, and income dimensions that constitute the HDI (UNDP, 2023). As a composite measure of multidimensional welfare, the HDI reflects not only income poverty but also the inability of individuals to access quality healthcare, attain adequate education, and maintain a decent standard of living all of which remain severely constrained for a significant proportion of Nigerians. This suggests that increases in agricultural output over the years have not translated proportionately into meaningful reductions in poverty and deprivation among the population.

Poverty has traditionally been viewed as a condition of low income and inability to meet basic human needs. However, contemporary development literature conceptualizes poverty from a multidimensional perspective which extends beyond income deprivation to include poor health conditions, low educational attainment, unemployment, food insecurity, and inadequate standard of living. In line with this perspective, this study conceptualizes poverty as a condition of deprivation reflected in poor access to healthcare, limited educational opportunities, low standard of living, and inadequate economic opportunities among individuals and households. This conception aligns with the multidimensional nature of poverty captured by the Human Development Index through its components of life expectancy at birth, expected years of schooling and mean years of schooling, and Gross National Income per capita. Consequently, deficiencies in these dimensions represent major manifestations of poverty within the Nigerian economy.

Theoretically, agricultural output is expected to reduce poverty through increased food availability, employment generation, income improvement, and enhanced access to basic social amenities. Increased agricultural activities can improve household income particularly among rural farmers, thereby improving access to healthcare services, educational opportunities, nutrition, and better living conditions. These channels are directly connected to the dimensions of the Human Development Index, as improvements in rural incomes enhance Gross National Income per capita, better nutrition and healthcare access raise life expectancy at birth, and increased earnings from agricultural activity facilitate school enrolment and retention, thereby raising educational attainment levels. However, empirical evidence on the relationship between agricultural output and poverty in Nigeria remains mixed and inconclusive. For instance, Umar et al. (2023) found that growth in agricultural output enhanced per capita income and minimized poverty in Nigeria, thereby supporting the growth-poverty reduction hypothesis.

Similarly, Owonda (2024), Betrand (2023), Tochukwu et al. (2022), Osabohien et al. (2023), and Aderemi et al. (2021) reported that agricultural growth and agricultural investments contribute positively to poverty reduction and human development outcomes. However, contrary evidence exists in the literature. Adebayo et al. (2024) maintained that the poverty-reducing effect of economic activities in Nigeria depends largely on prevailing macroeconomic and structural conditions within the economy. Likewise, Onuoha et al. (2023) and Omodero (2021) found negative relationships between agricultural output and poverty reduction due to structural inefficiencies, weak market integration, and poor institutional support within the Nigerian economy.

The persistent poverty condition in Nigeria has been worsened by structural challenges confronting the agricultural sector including poor infrastructure, insecurity, climate variability, post-harvest losses, weak market integration, and inadequate institutional support. Reuters (2024) and Associated Press (2025) reported that insecurity, drought, floods, and disruptions in food-producing regions continue to negatively affect agricultural value chains and rural livelihoods in Nigeria. In addition, the average agricultural growth rate

between 2020 and 2024 stands at 1.8% which remained below the country's population growth rate of about 2.11% annually, raising concerns regarding the inclusiveness of agricultural growth in reducing poverty. Although several policy interventions such as the Agricultural Credit Guarantee Scheme Fund, National Fadama Programme, and Anchor Borrowers Programme were introduced to improve agricultural productivity and rural livelihood, poverty remains persistent especially in rural communities dependent on agriculture. The failure of agricultural growth to translate into meaningful poverty reduction is particularly evident in Nigeria's stagnant HDI performance, where life expectancy, educational attainment, and per capita income have shown only marginal improvements over successive decades, underscoring that agricultural sector challenges have constrained progress across all dimensions of human development (UNDP, 2023).

This study therefore hypothesizes that agricultural output influences multidimensional poverty conditions in Nigeria through its effects on income generation, employment opportunities, food security, healthcare access, educational attainment, and standard of living. To capture broader macroeconomic and labour market conditions influencing poverty, the study further incorporates real gross domestic product and labour-force participation rate as control variables. The study hypothesized that there is no significant relationship between agricultural output and poverty in Nigeria.

It is against this background that this study examines the impact of agricultural output on poverty in Nigeria between 1982 and 2024, using the Human Development Index as a multidimensional poverty-related indicator. The period encompasses Nigerian Structural Adjustment Programme, democratic transitions, and agricultural policy reforms that shaped poverty and human development outcomes. The rest of the paper is structured as follows: Section 2 reviews the relevant literature; Section 3 presents the methodology; Section 4 discusses the findings; while Section 5 concludes the paper.

2.1 Literature Review

2.2 Conceptual Literature

Agricultural Output

Ojima (2024) conceptualizes agricultural output as the sum of monetary value of crop, fishing, livestock, and timber production. According to John and Dankawu (2018), agricultural output can be defined as aggregate output of agricultural production over a given duration of time thus showing the overall performance of crop, livestock, and other related sub-sectors. On the same note, Todaro and Smith (2020) describe agricultural output as the sum total of goods and services that agricultural activities produce, such as crops, livestock, forestry, and fisheries, over a specified period of time, and observe that it adds to national income and food security.

Therefore, agricultural output within the framework of this study refers to as the aggregate production in the agricultural industry, which includes agricultural output in the form of production of crops, livestock production, fishing, forestry and value addition activities which include processing, packaging, and distribution.

Poverty

Poverty refers to a condition where individuals are unable to attain the minimum standard of living necessary for decent human existence. Poverty is not limited to low income alone but also encompasses deprivation in health, education, nutrition, employment opportunities, and access to basic social amenities. According to Sen (1999), poverty represents capability

deprivation where individuals lack the freedom and opportunity to achieve acceptable standards of living and well-being. Similarly, Todaro and Smith (2020) described poverty as a condition characterized by hunger, disease, illiteracy, unemployment, poor healthcare, and low life expectancy. This perspective suggests that poverty extends beyond income insufficiency to include broader dimensions of human deprivation and poor living conditions.

In recognition of the multidimensional nature of poverty, the United Nations Development Programme introduced the Human Development Index in 1990 through the contributions of Mahbub ul Haq and Amartya Sen. The HDI measures human development using three major dimensions namely life expectancy at birth representing health outcomes, education measured through expected years of schooling and mean years of schooling, and Gross National Income per capita representing standard of living. These dimensions provide a broader assessment of living conditions and deprivation associated with poverty.

Within the context of this study, poverty is conceptualized from a multidimensional perspective using the Human Development Index to examine the extent to which agricultural output contributes to improvements in health conditions, educational attainment, income level, and standard of living in Nigeria. Although HDI is not a direct poverty index, improvements in its components are closely associated with reductions in deprivation and poverty-related conditions. Therefore, this study conceptualizes poverty in terms of deficiencies in health, education, and standard of living, while HDI serves as a multidimensional poverty-related indicator for assessing deprivation conditions in Nigeria.

2.3 Theoretical Framework

This study is anchored on the Agriculture-Led Growth Model proposed by John Mellor in 1976 in his book The New Economics of Growth. Mellor, a prominent agricultural economist, developed this framework to explain how agricultural growth in low-income countries drives broad-based poverty reduction and economic transformation. The model posits that agricultural output growth reduces poverty through three interconnected pathways. First, direct income effects: increased production raises the incomes of smallholder farmers, who constitute the majority of the poor. Second, consumption linkages: higher rural incomes generate demand for locally produced non-agricultural goods and services, creating employment for the landless and urban poor. Third, production linkages: agricultural growth stimulates demand for inputs and processing services, further expanding rural non-farm employment. Critically, Mellor emphasized that this growth must be broad-based driven by smallholders adopting improved technology, rather than concentrated in large-scale farms, to maximize poverty reduction.

The relevance of this model to the present study is direct and compelling. First, it provides a clear causal mechanism linking agricultural output to poverty outcomes, allowing the study to test whether increased production in the study area has generated multiplier effects. Second, it focuses attention on distributional dynamics, whether the benefits of growth reach smallholders and the landless. Third, it helps interpret findings: if agricultural output rises but poverty persists, the model would attribute this to weak linkages, such as poor market access, inequality, or lack of complementary infrastructure.

By adopting Mellor's model as its theoretical framework, this study gains a structured lens to analyze how agricultural output transforms livelihoods. It moves beyond simple correlation to examine the structural pathways connecting production to poverty reduction. This framework guides variable selection, data analysis, and policy recommendations, ensuring the study contributes meaningfully to the longstanding debate on agriculture's role in

development. The model's emphasis on smallholder-driven, broad-based growth aligns directly with the study's focus on poverty alleviation among rural households.

2.4 Empirical Review

Several empirical studies on the relationship between Agricultural Output and poverty have produced inconclusive findings due to differences in methodology, poverty measurement, and structural conditions across economies.

Adeoye (2024) used an Autoregressive Distributed Lag (ARDL) model to examine the nexus between agricultural productivity and poverty reduction in Nigeria between 1980 and 2021 using the Human Development Index as a multidimensional welfare measure. The findings revealed a statistically significant positive relationship between agricultural productivity particularly in crops, fisheries, and forestry and human capital development. Similarly, Ogunjobi et al. (2024) applied the ARDL estimation technique to determine the relationship between agricultural financing, poverty reduction, and economic growth in Nigeria between 1981 and 2021. Their findings indicated a positive but statistically insignificant relationship between agricultural credit and poverty reduction. In the same vein, Mohamad (2024) found that long-run agricultural growth exerts a positive effect on poverty reduction, although structural rigidities weaken short-run gains. Likewise, Owonda (2024) employed the ARDL framework to investigate the effectiveness of agricultural investment in reducing poverty between 1989 and 2019. The study established that long-run investment in agriculture significantly reduced poverty both in the short and long run.

In 2023, several empirical studies further examined the agriculture-poverty nexus using different econometric approaches. Betrand (2023) evaluated the sectorial contribution to poverty reduction in selected Sub-Saharan African economies covering 1988, 1999, 2019, and 2020. The findings showed that agricultural value added had a significant impact on poverty reduction compared to other sectors. Similarly, Umar et al. (2023) investigated the impact of agricultural output on poverty reduction in Nigeria between 1981 and 2020 using the ARDL bounds testing approach. The study found that agricultural output growth significantly increased per capita income and consequently facilitated long-run poverty reduction. Chukwu et al. (2023) employed Ordinary Least Squares (OLS) regression to investigate the relationship between farm financing and poverty reduction in rural areas. Although state agricultural expenditure exerted no major effect on welfare improvement, agricultural credit indirectly reduced poverty through increased agricultural output.

Furthermore, Onuoha et al. (2023) estimated the dynamics of agricultural value-chain development and poverty reduction in Nigeria between 1990 and 2022 using ARDL techniques. Their findings revealed a negative relationship attributed to structural inefficiencies and weak market integration. Similarly, Osabohien et al. (2023) examined the interdependence between agro-financing, institutional frameworks, and poverty in low- and middle-income African countries. The study revealed that agricultural output positively influenced poverty reduction under efficient institutional arrangements.

Earlier studies also provided evidence on the relationship between agricultural output and poverty reduction. Tochukwu et al. (2022) employed cointegration and causality techniques to examine the relationship between agriculture, food security, and poverty reduction between 1990 and 2019. The findings revealed that food production serves as a major channel through which food security contributes to poverty reduction. Likewise, Omodero (2021) found a negative but statistically insignificant impact of agricultural production on poverty reduction, suggesting weak welfare transmission mechanisms within the agricultural sector. Similarly, Aderemi et al. (2021) established that agricultural production significantly

contributes to poverty reduction both in the short and long run under a stable macroeconomic environment.

The reviewed empirical literature reveals that studies on the relationship between agricultural output and poverty have produced mixed and inconclusive findings due to differences in methodology, measurement of poverty, and structural conditions across economies. While several studies such as Adeoye (2024), Owonda (2024), Umar et al. (2023), and Aderemi et al. (2021) reported positive effects of agricultural output on poverty reduction, others including Onuoha et al. (2023) and Omodero (2021) found negative or insignificant relationships. In addition, most existing studies focused mainly on income-based poverty indicators, agricultural financing, or agricultural productivity without adequately capturing multidimensional poverty conditions. Furthermore, few studies incorporated the Human Development Index as a multidimensional poverty-related indicator within the Nigerian context using recent data. Therefore, this study fills the gap by examining the impact of agricultural output on multidimensional poverty in Nigeria using HDI, real gross domestic product, and labour-force participation rate within an ARDL framework covering the period 1982–2024.

3.0 Methodology

This study assessed the impact of agricultural output on poverty reduction using HDI as a proxy for poverty reduction in Nigeria spanning the period between 1982–2024.

3.1 Model Specification

This study adapted and modified the model used by Umar et al. (2023), who employed the ARDL model to examine the relationship between agricultural productivity and poverty alleviation in Nigeria spanning the period between 1981 – 2020. Thus, the model for their study is specified as follows:

$$PI = f\left(AP, RGDP, AL\right) \tag{1}$$

The functional relationship of the model was transformed to econometric form as:

$$PI_t = \alpha_0 + \beta_1 AP_t + \beta_2 RDGP_t + \beta_3 AL_t + \mu_t \tag{2}$$

For the purpose of achieving valid results, the high decimal series were logged for accurate analysis as;

$$\ln PI_t = \alpha_0 + \beta_1 \ln AP_t + \beta_2 \ln RGDP_t + \beta_3 \ln AL_t + \mu_t \tag{3}$$

Thus, the ARDL model expressed as;

$$\begin{aligned} \ln PI_t = {} & \alpha_0 + \beta_1 \sum km = 1 \Delta \ln AP_{t-j} + \beta_2 \sum kn = 1 \Delta \ln AL_{t-c} \\ & + \beta_3 \sum k = 1 \Delta \ln RGDP_{t-d} + \beta_4 \sum kp = 1 \Delta \ln PI_{t-h} + \beta_5 ECT + \mu_t \end{aligned} \tag{4}$$

Where PI = Per Capital Income (a proxy for poverty reduction), AP = Agricultural Output, RGDP =Real Gross Domestic Product, AL = Agricultural Loan to Individuals, αis = constant, intercept, βi (where i= 1,2,3,4,5,6,7,8) are the coefficients of the variables, ECT= the Error Correction Term, μ = Error Term , t = the Time Period, Δ = the Difference Operator, and ln is the Natural Log Transformation.

This study modifies the model of Umar et al. (2023) by excluding per capita income (PCI) and agricultural loan (AL) while incorporating the Human Development Index (HDI), real gross domestic product (RGDP), and labour-force participation rate (LFPR). The replacement of per capita income (PI) with HDI is justified by the multidimensional nature of poverty examined in this study. Unlike per capita income which captures only income dimension, HDI provides a broader measure of poverty-related deprivation through its components of health, education, and standard of living. Consequently, HDI is considered more appropriate for capturing multidimensional poverty conditions in Nigeria.

Similarly, agricultural loan (AL) was excluded because the study focuses primarily on the direct impact of agricultural output on poverty rather than agricultural financing. In its place, RGDP and labour-force participation rate (LFPR) were incorporated to capture broader macroeconomic and employment conditions influencing poverty in Nigeria. RGDP reflects the overall level of economic performance and productive activities capable of affecting poverty conditions, while labour-force participation rate captures the extent of productive engagement and employment opportunities within the economy. Therefore, the inclusion of RGDP and LFPR provides a broader framework for explaining multidimensional poverty conditions beyond sector-specific financing variables.

Accordingly, the functional model for this study is expressed as:

$$PI = f\left(AP, RGDP, LFPRT\right) \tag{5}$$

Where HDI = Human Development Index (represent a multidimensional poverty-related indicator), AP =Agricultural Output, RGDP = Real Gross Domestic Product, and LFPR = Labour Force Participation Rate. Thus, the econometric equation is expressed as follows:

$$HDI_t = \alpha_0 + \beta_1 AP_t + \beta_2 RGDP_t + \beta_3 LFPR_t + \mu_t \tag{6}$$

However, in order to correct for possible heteroscedasticity in the model and also to minimize spurious results, some of the variables in equation (6) are transformed into a log linear form as given below.

$$HDI_t = \alpha_0 + \beta_1 \ln AP_t + \beta_2 \ln RGDP_t + \beta_3 LFPR_t + \mu_t \tag{7}$$

Where HDI = Human Development Index (represent a multidimensional poverty-related indicator), lnAP =Natural Log of Agricultural Output, lnRGDP = Natural Log of Real Gross Domestic Product, LFPR = Labour Force Participation Rate, μt = Error Term, $\alpha 0$ = Intercept, β1 – β3 = Parameters to be Estimated, t = Time Period and ln = Natural Log Transformation

The long-run form of model two can be specified as:

$$\begin{aligned}\Delta HDI_t = \alpha_0 + \beta_1 \sum \Delta HDI_t + \beta_2 \sum \Delta \ln AP_{t-1} + \beta_3 \sum \Delta \ln RGDP_{t-1} \\ + \beta_4 \sum \Delta LFPR_{t-1} + \mu_t\end{aligned} \tag{8}$$

The parameter $\alpha 0$ and represent the intercept and disturbance error term, t= time, Σ is summation sign, ln is the natural log transformation and Δ is the difference operator respectively.

Equation (8) test the null hypothesis $\beta_1 = \beta_2 = \beta_3 = 0$ there is no cointegrating relationship between the variables against the alternative of cointegration using the bound testing procedure to test long-run relationship of the model. However, in order to measure the speed of adjustment from the short run dynamic to longrun equilibrium, the short-run model is specified by also including the error correction term as follow:

$$\Delta HDI_t = \alpha_0 + \beta_1 \sum \Delta HDI_t + \beta_2 \sum \Delta \ln AP_{t-1} + \beta_3 \sum \Delta \ln RGDP_{t-1} + \beta_4 \sum \Delta LFPR_{t-1} + \phi ECT_{t-1} + \mu_t \quad (9)$$

Where ɸ is the coefficient of the error correction term which measures the speed of adjustment from the short-run dynamics to the long-run equilibrium, ECT is the error correction term, and µt represent the error term. In theory, the coefficient ɸ is expected to be significant and negative for short-run convergence to take place.

3.2 Sources of Data and Measurement of Variables

The study used secondary annual time series data. The variables on which data were obtained from Central Bank of Nigeria Statistical Bulletin (CBN, 2024) are agricultural output (AP), real gross domestic product (RGDP) while labour force participation (LFPR) and human development index (HDI) variables were obtained from the World Development Indicators (WDI, 2024) and United Nations Development Programme Human Development Reports (UNDP HDR, 2023/24) respectively. Agricultural output is measured as agricultural value added/GDP contribution (₦ billion), RGDP is measured at constant price GDP (₦ billion), LFPR is measured as percentage of economically active population, while HDI is measured by the annual human development index values ranging from 0 to 1

4.0 Discussion of Results

4.1 Unit Root Tests

Table 1: Result of the ADF Unit Root Test

Variables	ADF @ Level	ADF @ First Diff.	Remark
HDI	0.872(0.994)	7.170(0.00) ***	I(1)
lnAP	-0.742(0.825)	-6.086(0.00)***	I(1)
lnRGDP	-0.928(0.770)	-5.300(0.00)***	I(1)
LFPR	1.037(0.729)	4.938(0.00)***	I(1)

Note: ***/**/* indicates statistically significant at 1%, 5%, and 10% respectively
Source: Computation Output Using E-views 10, 2026

The order of integration of variables is a crucial factor in the econometric analyses since it reduces internal inconsistencies in the variables of the study. The cointegration theory asserts that the order of integration between the variables involved has to be the same. The integration order of every variable in this study was found by preliminary testing using the Augmented Dickey Fuller (ADF) Unit root tests. The null hypothesis of non-stationarity was stated in the form of the unit-root tests with the alternative hypothesis of stationarity. The stationarity of all variables was obtained after first differencing (I(1): HDI, lnAP, lnRGDP, LFPR) and none of them had to be second differenced (i.e. none was I(2)). Therefore, the ARDL bound-testing approach is confirmed to investigate the interrelations of these variables in the long-run.

4.2 Lag Length Criteria for F-Bound Test

Table 2: Presents the Lag Length Criteria for F-Bound Test

Lag	LogL	LR	FPE	AIC	SC	HQ
0	106.9430	NA	2.29e-08	-6.238967	-6.057572	-6.177933
1	264.3486	267.1126	4.39e-12	-14.80901	-13.90203	-14.50384
2	309.0922	65.08158*	8.07e-13*	-16.55104*	-14.91849*	-16.00174*

Note:* indicates lag order selected by the criterion. LR: sequential modified LR test statistic (each test at 5% level), FPE: Final prediction error, AIC: Akaike information criterion, SC: Schwarz information criterion and HQ: Hannan-Quinn information criterion.
Source: Computation Output Using E-views 10, 2026

Table 2 shows the results of the lag-order selection using five different criteria, namely AIC, SC, HQ, FPE, and LR. All the criteria suggested lag 2 as the optimal lag length. As such, a lag of two was used in the F-bound cointegration test, which was approved by the AIC because it is a methodologically balanced choice. The option allows representing the intertemporal dynamics between the variables more accurately. Additionally, it reduces the risks of over fitting and degrees of freedom losses, hence, the strength of the cointegration results.

Table 3 :

ARDL Bound Testing for Cointegration Analysis H0: No cointegration.

Test Statistic	Value	Signif.		I(0)	I(1)
			Asymptotic: n=1000		
F-statistic	5.672085	10%		2.72	3.77
K	3	5%		3.23	4.35
		2.5%		3.69	4.89
		1%		4.29	5.61

Source: Computation Output Using E-views 10, 2026

Table 3 presents the F-bound test results examining the long-term relationship between HDI as a measure of multidimensional poverty in Nigeria and agricultural output (lnAP), real gross domestic product (lnRGDP), and labour force participation (LFPART). The F-statistics of 5.672 exceeds the 5% critical values of 4.35 and 3.23, indicating a significant cointegration among the variables. This leads to the rejection of the null hypothesis of no long-run relationship, confirming that the variables move together over time. The findings imply that changes in agricultural output, real gross domestic product, and labour force participation have sustained impacts on HDI as a measure of multidimensional poverty during the period under review.

4.3 Long-Run ARDL Estimates

Table 4: ARDL Long-run Estimation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
lnAP	-0.038	0.017	-2.196	0.0389**
lnRGDP	0.213	0.030	7.156	0.0000***
LFPART	0.048	0.006	8.254	0.0000***

Source: Computation Output Using E-views 10, 2026

Table 4 illustrates the relationship between the variables and the coefficient of agriculture output (lnAP) in the long-run has a negative but significant impact on multidimensional poverty (HDI) in Nigeria at 5% level of significance. lnAP has a coefficient of -0.038 meaning that a per cent increase in lnAP will lead to approximate a 0.038 per cent decline in HDI

indicating a worsening of multidimensional poverty condition in the long run. The result suggests that growth in the agricultural sector in Nigeria within the period under review has been non- inclusive and structurally constrained, failing to translate into improvements in health outcomes, educational attainment, and living standard of the Nigerian population.

The result is consistent with the findings of Onuoha et al. (2023) and Omodero (2021), who reported similar negative relationships between agricultural output and poverty outcomes in Nigeria. It however, deviates from the findings of Adeoye (2024), Owonda (2024), Betrand (2023), Umar et al. (2023), Tochukwu et al. (2022), Osabohien et al. (2023), Aderemi et al (2021) and Mohamad (2024) who found that agricultural output has a positive impact on poverty reduction in their studies. This outcome may be attributed to the dominance of subsistence farming, post-harvest losses, weak rural market integration and wide spread insecurity in food-producing regions. All of which prevent agricultural growth from generating the income and welfare multipliers necessary to reduce multidimensional poverty.

On the other hand, economic growth (lnRGDP) which was included as a control variable to isolate the effect of agricultural output on poverty (HDI) exerts a positive significant impact on multidimensional poverty in Nigeria at the 1% level of significance, the estimated coefficient of 0.213 indicate that a percent increase in real GDP leads to approximately a 0.213 percent improvement in HDI, confirming the significant role of macroeconomic growth in improving human development outcome in Nigeria This result align with the findings of Mohamad (2024) and Tochukwu et al. (2022) validating the inclusion of RGDP as a control variable. Similarly, Labour force participation rate (LFPR) a control variable also revealed a positive significant effect on multidimensional poverty (HDI) in Nigeria at 1% level of significance with a coefficient of 0.048, implying that, a percent increase in LFPR leads to approximately a 0.048 per cent improvement in HDI, confirming that labour market conditions constitute an important determinant of poverty outcomes in Nigeria. This result is in line with the finding of Osabohien et al. (2021), further validating the model specification.

4.4 Short-Run ARDL Error Correction Model (ECM)

Table 5: Results of ARDL Error Correction Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.373	0.468	-5.066	0.0000***
D(lnAP)	-0.002	0.006	-0.331	0.744
D(lnAP(-1))	-0.054	0.007	-7.230	0.0000***
D(lnRGDP)	-0.003	0.015	-0.216	0.831
D(lnRGDP(-1))	-0.081	0.028	-2.863	0.009***
D(LFPART)	0.002	0.001	1.133	0.269
D(LFPART(-1))	-0.020	0.004	-4.756	0.0001***
ECT(-1)*	-0.438	0.086	-5.078	0.0000***
R-squared	0.926	Mean dependent var		0.004
Adjusted R-squared	0.906	S.D. dependent var		0.0055
S.E. of regression	0.002	Akaike info criterion		-9.794
Sum squared resid	6.64E-05	Schwarz criterion		-9.431
Log likelihood	169.601	Hannan-Quinn criter.		-9.672
F-statistic	44.937	Durbin-Watson stat		1.587
Prob(F-statistic)	0.000000			

Source: Computation Output Using E-views 10, 2026

Table 5 shows the results of the short-run relationship between human development index (HDI), its independent variable agriculture output (lnAP), and other control variables (i.e. real gross domestic product (lnRGDP), and labour force participation rate (LFPART)). The result

revealed that there exists a negative relationship between agricultural output and human development index in the current year (D(lnAP)), and its previous one year (D(lnAP(-i))). Their coefficients as revealed in table 5 are -0.002 and -0.054respectively, suggesting that a percent increase in these variables will lead to about 0.002% and 0.054% increase in human development index (HDI) in the short-run. The result indicate that growth in the agricultural sector in Nigeria within the period under review has been non- inclusive and structurally constrained, failing to translate into improvements in health outcomes, educational attainment, and living standard of the Nigerian population. The result is consistent with the findings of Onuoha et al. (2023) and Omodero (2021), who reported similar negative relationships between agricultural output and poverty outcomes in Nigeria.

Similarly, results in table 5 also show that economic growth in the current year (D(lnRGDP)), and the previous year (D(lnRGDP(-1))) respectively has a negative effect on multidimensional poverty (HDI) in the short-run with coefficient values of -0.003 and -0.081. This imply that, a percent increase in these variables will cause an approximately 0.003% and 0.08% decrease respectively in HDI. This suggests that short-term economic growth does not immediately translate into improvements in human development. The result is consistent with the findings of Onuoha et al. (2023) and Omodero (2021), who reported weak and insignificant poverty-reducing effects of economic growth in their studies

Labour force participation rate in the current year (D(LFPART)) however, revealed a positive but insignificant relationship with human development index (HDI) with coefficient value of 0.002 while the previous one year (D(LFPART(-1)) showed a negative but significant effect on multidimensional poverty in Nigeria as measured by (HDI). This implies that, increase in labour force participation in the short run are associated with a worsening of multidimensional poverty conditions across the health, education and living standard dimension captured by HDI. This contrast with the positive long run relationship, reflecting the absorption of new labour market entrants into low-skilled and informal subsistence level activities that generate insufficient income to improve multidimensional poverty condition in the short-run

The slope coefficient of the error correction term (ECT (-1)) in table 5, is negatively sign and significant at the 1% leveln show a coefficient of -0.438 and p value of 0.0000. The coefficient of -0.438 signifies that about 43.8% of the disequilibrium which occurs in the short-run is corrected over the long-run. In other words, the annual speed of adjustment from short-run shocks or divergence to longrun equilibrium is as high as 43.8%. In addition, the adjusted R-squared of 0.91 indicates that approximately 91% of the variations in multidimensional poverty (HDI) in Nigeria are explained by agricultural output, real gross domestic product, and labour force participation in the model, after adjusting for the number of variables included in the model. The Durbin-Watson statistics of 1.587 indicates that the model has positive serial correlation.

5.0 Conclusion and Policy Recommendations

This study examined the impact of agricultural output on poverty in Nigeria using the Human Development Index (HDI) as a measure of multidimensional poverty over the period 1982 to 2024 using the Autoregressive Distributed Lag (ARDL) model. The empirical findings reveal that agricultural output exerts a negative and significant effect on multidimensional poverty in Nigeria, indicating that agricultural growth during the study period was not inclusive, and structurally constrained, failing to translate into meaningful improvements in the health, education, and living standard condition of the Nigerian population.

In contrast, real gross domestic product and labour force participation rate have positive and significant long-run effects on multidimensional poverty, confirming that broad-based economic growth and sustained workforce engagement are more effective long-run drives of poverty reduction than agricultural output expansion. However, in the short-run, both real gross domestic product and labour force participation rate exerts negative effects on multidimensional poverty suggesting that the immediate benefits of economic growth and workforce engagement are constrained by structural rigidities, informal employment dominance, and transitional adjustment costs that prevent shortrun welfare.

Based on the findings of this study, the following policy recommendations are proposed. First, agricultural policy in Nigeria should shift focus from mere output expansion towards inclusive productivity enhancement, value chain addition and deliberate structural reforms that connect agricultural growth to household income improvement among smallholder farmers. Second, government should sustain broad- based macroeconomic growth through infrastructure investment and economic diversification, as RGDP growth proved a more effective driver of multidimensional poverty reduction than agricultural output alone. Third, deliberate skill development programmes and employment generation initiatives targeting informal sector workers should be implemented to ensure that labour force participation translate into productive, income generating engagement capable of improving multidimensional poverty conditions in both the short and longrun.

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