IMPACT OF RICE PRODUCTION ON POVERTY RATE IN USHONGO LOCAL GOVERNMENT AREA OF BENUE STATE, NIGERIA

By

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Abstract

This study evaluated the impact of rice production on poverty rate in Ushongo Local Government Area (LGA) of Benue State – Nigeria. The specific objectives of the study were to examine the impact of rice output, rice income and rice labour employment on poverty rate in Ushongo LGA of Benue State. A population of 628 was arrived at from a pre-survey conducted in the study area; where a sample size of 239 rice producers was drawn with the aid of the Krejcie & Morgan (1970) formula. The study adopted survey design through primary data, which was collected from rice producers in the study area with the aid of survey questionnaires. Descriptive statistical tools such as tables, simple percentages and charts were used for data presentation and analysis; the Logit Regression was employed to test the hypotheses of the study. Findings from the results of the logistic regression model show that rice output has a negative and significant impact on poverty rate and that rice income has a negative and significant impact on poverty rate. The findings also revealed that rice labour employment has negative and statistically significant impact on poverty rates in the study area. The study therefore recommended amongst others that policies and programmes should be implemented by government to support and incentivize increased rice production among farmers in the study area, and that efforts should be made to diversify income sources for rice producers, such as promoting value-added activities like rice processing, packaging, and marketing.

Keywords: Rice Production, Poverty Rate, Rice Output, Rice Income, Rice Labour Employment

Introduction

Nearly all nations in the world establish development policy goals that often incorporate elements of reducing poverty, enhancing quality of life, and achieving food self-sufficiency. Poverty is a human development problem in developing countries, and an ongoing problem in Nigeria. Until the end of the 20th century poverty remained a global burden that had to be faced together in the Sustainable Development Goals (SDGs) era, which was triggered to continue and strengthen the achievement of the Millennium Development Goals (MDGs) goals to be sustainable (Ishartono and Raharjo, 2015; Suryawati, 2005; Gonner et al., 2015).

According to the Food and Agriculture Organisation of the United Nations, FAO, (2017), poverty and agriculture are key indicators for the success of a country's development. FAO (2017) added that population dynamics and agriculture are the main causes of structural changes. Because it affects people's access to opportunities for economic, social, cultural, and political participation in society (Chambers, 1995; Carter and Barrett, 2006), poverty is a multifaceted structural issue. Based on the 2012 World Development Index, which is a re-evaluation of the "$1 per day" poverty line, household living standards open the door for a deeper investigation of the nature and extent of poverty (Christiaensen et al., 2011).

The international poverty line has been updated to $1.25 per day based on purchasing power parity since 1999, according to the World Bank (2001). The prevalence of poverty changes from a developed country to a developing country (World Bank, 2018). Additionally, it differs between urban and rural areas even within the same nation. Each nation has developed its own national policy to address poverty. The World Bank (2020) reports that because of the global economic downturn and the steep decline in gross domestic product (GDP) per capita, poverty rates have increased for the first time since 1998. The deepening crisis reversed nearly all of the gains made over the previous five years. According to the World Bank analysis, COVID-19 caused 40 to 60 million people to live in extreme poverty (less than $1.90/day) in 2020 compared to 2019 depending on assumptions about the size of the economic shock. To reach about 9 percent in 2020, the global rate of extreme poverty has increased by 0.3 to 0.7 percentage points (World Bank, 2020). It is important to note that these poverty statistics are highly volatile and differ significantly among nations of the world.

The statistics of poverty are even worse in developing countries. Sub-Saharan Africa is reported as one of the poorest regions in the word. The World Bank (2016) estimated that about 389 million persons out of 904 million in Sub-Saharan Africa, corresponding to 43% of the population, live under the poverty line of US$ 1.90 per day. Poverty in Sub-Saharan Africa is predominantly rural as more than 70% of poor people live in rural areas and depend on agriculture for their food and livelihood (The International Fund for Agricultural Development, IFAD, 2012). Sub-Saharan Africa has the highest prevalence of hunger in the world and in 2012 and 2014, about 25% and 22% of the population, respectively, were food insecure (Sasson, 2012; FAO, 2015). Moreover, the per-capita consumption of more than 239 million persons is estimated to be below the food energy target of 2100 food calories per day (World Bank, 2016).

Nigeria, though endowed with abundant human, capital and natural resources, has remained one of the poorest countries in the world (Kalu and Nenbee 2013; Adejuwon and Tijani, 2012). About 100 million Nigerians live on less than $1 per day and the country was ranked 142nd poorest country out of 175 countries in 2010 by the United Nations Human Development Index (IFAD, 2012; NBS, 2011). The percentage of Nigerians living in absolute poverty, rose to 60.9% in 2010, compared to 54.7% in 2004, the situation being more severe in North-Western and North-Eastern part of the country where a staggering 77.7% and 76.3% respectively, of the population are poor (NBS, 2011). Income inequality has also risen from 0.429 in 2004 to 0.447 in 2010 (NBS, 2011). The Federal Office of Statistic and World Bank in their analysis of the poverty trend in Nigeria have shown that poverty is more prevalent in rural farming households (Adeolu and Taiwo, 2004; Kudi et al., 2008).

In recent years, poverty reduction has attracted the attention of various governmental and non-governmental organisations all over the world. In Nigeria, efforts aimed at reducing poverty over the years include Operation Feed the Nation (OFN), the Green Revolution, Peoples Bank of Nigeria (PBN) and Community Banks. Other programmes implemented to reduce poverty were Directorate of Food Roads and Rural Infrastructure (DFFRI), Nigerian Agricultural Land Development Authority (NALDA), Family Economic Advancement Program (FEAP), Better Life for Rural Women, Family Support Program (FSP), National

Poverty Eradication Program (NAPEP), Empowerment and Development Strategy (NEEDS). Recently, the national social investment programme (NSIP), which, is made up of different programmes to tackle poverty are npower, tradermoni, market moni, conditional cash transfer and the home-grown school feeding programme. The national social investment programme and other agricultural galvanizing programmes by the Federal Ministry of Agriculture and Rural Development were/are targeted at increasing agricultural output in a bid to reduce the menace of poverty.

Despite the presence of rice production in Ushongo Local Government Area of Benue State, the menace of poverty persists. Moreover, rice is the most important staple food crop, both for food security and cash income. In the producing areas, it provides employment for more than 80 per cent of the inhabitants as a result of the activities that take place along the distribution chains from cultivation to consumption (Ogundele and Okoruwa, 2006). It contributes immensely to both internal and sub-regional trade. Rice production is also a profitable enterprise (Awotide et al., 2014). Benue State from where Ushongo LGA belong to, is popularly acclaimed the Food Basket of the Nation and about 70 percent of the land mass is rural where the same percent of the population who are primitively farmers live, hunger and starvation are the order of the day and the State is among the poorest in the country (Yuwa, 2004).

Some studies have often concluded that rice farming/production and processing activities have reduced poverty of rice farmers/producers and millers (Anga and Abimiku, 2021; Coulibaly et al., 2020; Hussaini et al., 2020; and Ogah et al., 2019; Okpe et al., 2014; Abur, 2014; Akighir, 2011). Even the few studies (Ogah et al., 2019; Okpe et al., 2014; Abur, 2014; Akighir, 2011) that have been conducted in Benue State have come to similar conclusion of positive influence of rice production and poverty reduction. Researchers have, however, largely failed to examine the impact of rice production on poverty reduction in Ushongo Local Government Area of Benue State. This study, therefore, undertook an impact assessment of rice production on poverty in Ushongo LGA of Benue State so that the rice production situation in the LGA and the State could be redressed to stem the menace of poverty.

The specific objectives of this study are to:

i. examine the impact rice output on poverty rate in Ushongo LGA of Benue State;
ii. evaluate the impact of rice income on poverty rate in Ushongo LGA of Benue State; and
iii. determine the impact of rice labour employment on poverty rate in Ushongo LGA of Benue State

The following null hypotheses guided the study;

H_{01}: Rice output has no significant impact on poverty rate in Ushongo LGA of Benue State

H_{02}: Rice income has no significant impact on poverty rate in Ushongo LGA of Benue State

H_{03}: Rice labour employment has no significant impact on poverty rate in Ushongo LGA of Benue State

Literature Review

Conceptual Review

Rice production is the process of cultivating rice plant for the purpose of producing grains, which could serve as staple food or raw materials for production of other foods around the world (CBN, 2020). Rice production involves combination of activities including land preparation, see selection, seedling production, transplanting, irrigation, fertilization, weed control, pest and diseases control, harvesting and post harvesting activities. Rice known in Latin as Oryza sativa is one of the major staple food of the world, ranking third after wheat and maize on global level and second in terms of area under cultivation (Adegoye, 2003). It is a major source of food for about half of the world's population supplying basic energy needs of the people. In Nigeria, rice cultivation is an age long enterprise providing employment opportunities and source of food to vast and diverse population of the country. It has become a staple food for all household; both the rich and poor consume a great quantity (Adegoye, 2003). The most common rice varieties include long grain, medium grain and short grain rice. Rice production can be a source of livelihood for many people, especially in the rural areas. It could provide job opportunities for farmers, farm workers and others involved in the rice value chain. The components of rice production include: rice output, rice income and rice labour employment. These are discussed hereunder.

Rice Output

The output of rice is the quantity of rice produced by farmers in a given period. Rice output comprises of output sold (including trade between rice holdings); changes in stocks; output for own final consumption; output produced for further processing by rice producers; and intra-unit consumption of rice produce (Singh et al., 1997). Rice output either are sold by farmers to generate income or are processed for household consumption. This is the income earned or revenue generated from sources essentially premised on rice production activities. These sources of income include farming land, sales of rice produce and proceeds from labour activities involving rice production.

Rice Income

According to Akpokodje et al., (2001), rice income refers to income earned or revenue derived from sources that include farming land, buildings on or identified with an agricultural land and commercial produce from a horticultural land. It can also be described as any rent or revenue received from land that is used to produce rice; any income obtained from such land by rice operations, including the processing of rice produce to make it suitable for the market or the sale of such produce; any income attributable to a rice farm house; as well as any income received from seedlings grown in a nursery (FAO, 2002). According to this study, income from rice production is defined as the money that rice farmers and producers earn in exchange for their labour during rice production activities, the rental of equipment for rice farming, and the sale of rice output.

Rice Labour Employment

According to Ritchie's (2022) scholarly analysis, the measurement of employment encompasses the enumeration of individuals within the working-age population who are actively involved in a variety of undertakings aimed at generating goods or delivering services in exchange for remuneration or profit. Such a comprehensive definition encompasses individuals who are presently engaged in their occupations, as well as those who may be temporarily absent from their jobs or following unconventional working-time arrangements. It is important to note that labor performed by individuals who are not of working age, such as child labor, is duly excluded from this quantification. With regard to the

agricultural sector, the scope of employment comprises both those who are employed by agricultural activities and those subsistence farmers who engage in the production of goods primarily for their own sustenance rather than for commercial purposes.

Poverty Rate

Poverty is a concept that is experienced by the poor and observed by the rich, but its definition is with difficulty and has defied universally accepted and objective definition because it is not only an expression of life situation, but equally a state of mind and a perception of self in the complex web of social relation (Ekong, 1991 in Adawo, 2011). It was in the light of this understanding that Aboyade (1975) stated that poverty is like an elephant, it is more easily recognized than defined. The nature of poverty is such that it does not lend itself to a single definition. Poverty can therefore be said to be a multi-dimensional social phenomenon.

Poverty can be conceptualized in various ways to capture its multifaceted nature. In order to obtain a comprehensive understanding of poverty, it is imperative to incorporate both absolute, relative, and subjective measures. Absolute poverty refers to a condition where individuals lack the minimum resources necessary for basic survival, such as food, shelter, and clothing (Yekini et al., 2012). It is typically measured against a fixed threshold, like the international poverty line set by the World Bank at $1.90 per day. Relative poverty, on the other hand, is defined in relation to the economic status of other people within a society (Adawo, 2011). It considers individuals poor if their income and resources are significantly lower than the average, leading to an inability to participate fully in societal activities.

The poverty rate serves as an essential metric for evaluating the extent to which economic deprivation is prevalent within a given population. It provides a quantifiable measure of the percentage of individuals who reside below a specified income threshold that is necessary for meeting the basic standards required for sustaining a decent quality of life. Policymakers, researchers, and organizations heavily depend on poverty rates as critical indicators that allow them to assess the effectiveness of initiatives aimed at alleviating poverty and to gain insights into the distribution of wealth (Adawo, 2011). The calculation of poverty rates encompasses various considerations, including the size and composition of households, with

the income thresholds being adjusted based on either national or international standards. For global comparisons, the international poverty line, which is often determined by institutions such as the World Bank, is employed as a benchmark (Anga & Abimiku, 2021). Numerous factors contribute to the fluctuations observed in poverty rates, including economic conditions, social policies, and demographic trends.

Poverty rate assume a pivotal role in the formulation of public policy, as they influence the allocation of resources and facilitate the evaluation of the impact of social and economic interventions. Discussions and research pertaining to poverty rates often delve into the multidimensional nature of poverty, which encompasses factors beyond income, such as access to education, healthcare, and social services. Esteemed scholars like Ravallion (2012) underscore the significance of considering diverse poverty lines on a global scale, thereby acknowledging the varying economic contexts that exist. The World Bank's yearly publication, "Poverty and Shared Prosperity" (2021), provides a comprehensive analysis of global poverty trends and reversals, furnishing valuable insights. Additionally, Sen's seminal work (1985) on "Commodities and Capabilities" highlights the multifaceted dimensions of poverty that extend beyond mere income considerations.

The correlation between the poverty rate and the production of rice in Ushongo Local Government Area (LGA) is a complex one, as it is deeply intertwined with the economic conditions, agricultural activities, and general well-being of the local population. In this study area, the cultivation of rice holds immense significance as a crucial economic endeavour that greatly influences the livelihoods of numerous residents. The prosperity and obstacles faced by the local rice industry directly impact the poverty rate, as the income generated from rice cultivation serves as the primary source of sustenance for the local farmers. The overall well-being of the rice sector possesses the potential to significantly contribute to the reduction of poverty by creating employment opportunities and ensuring a steady flow of income for the community.

Empirical Review

Sultana et al. (2022) investigated impact of rice production on poverty status of Aman rice farmers and also assessed the relationship among them in the climate-vulnerable southern coastal areas of Bangladesh'. The study selected 125 Aman rice farmers using a simple

random sampling technique to estimate three types of yield gaps. Risk attitude was calculated using the safety-first model, and the Foster–Greer–Thorbecke model was employed to estimate poverty status. Results revealed a significant amount of yield gaps in Aman rice production, while farmers had opportunities to increase their production through the optimal use and scientific management of inputs. The study also revealed that half of the sampled farmers were poor, with a poverty gap of 15%. However, an increased number of non-poor was revealed due to a reduction both in yield gaps and farmers' risk-aversion attitudes. Therefore, the study suggests limiting the yield gap to manage farmers' risk-aversion attitudes, which would also facilitate improving their poverty situation.

Dauda et al. (2021) examined local rice production trends on poverty rate in Benue State, Nigeria from 1980 to 2016. Primary data was collected from 156 respondents using questionnaires and secondary data from the Benue Agricultural and Rural Development Authority (BNARDA) and analyzed using descriptive statistics, Z-test, growth model and Kendal's coefficient of concordance. The results showed that from 1980 to 2016, 9.5mt of local rice was produced in Benue State, with 99% of respondents being married, with a household size of 1-10 persons, and a mean household size of about 8 persons; the majority of respondents had attained tertiary school level and had low income. The findings also revealed that the mean quantity of local rice production was 257,333.06mt per year, and that factors inhibiting rice consumption included stones, poor aroma, impure rice, and broken grain. The study recommends intensifying policies focusing on increasing rice growth rate, breeding rice with aroma, and using modern processing mills for quality local rice.

Anga and Abimiku (2021) carried out a study on rice production (proxied by rice milling) and poverty reduction in Nasarawa State. The main objective of the study was ascertain the effects of engaging in rice milling on poverty reduction in the study area. The study adopted survey design where the results of the analysis of data, was done using logistic regression analysis. Findings revealed that star-up capital (SUC), quantity of rice produced (QRP), quantity of rice sold (QRS) and income from rice milling activities (INC) all have positive and statistically significant impact on poverty reduction in the study area, while the impact of expenses incurred is negative and statistically significant at 5% level of significance. The study therefore recommended that the government should support the rice milling industry by making available funds in terms of grants and low interest rate loans for investment in the

rice industry ad creating an enabling environment to reduce the cost incurred in running the business so as to increase income generation and consequently poverty reduction.

Hussaini et al. (2020) carried out a study on determinants of rice farmers' investment in value addition and its effect on poverty status in Kebbi State, Nigeria. The study examined investment of rice value addition activities among farmers in Kebbi State, Nigeria. Data used for the study were collected with the aid of structured questionnaire administered to 123 randomly selected farmers in three local government areas of the State. Data was analyzed using Foster Greek Thoerboeck (FGT) poverty index and logit regression technique. The results showed that poverty status among the rice farmers was high, as 58.3% were poor and 42.7% were non poor. The result of the analysis showed that the marginal effects of income from parboiling, winnowing, drying, destoning, and bagging value addition were negative and statistically significant related to farmer's poverty status at 1% level. It was recommended that farmers cooperatives should form collaboration with extension agent to make farmers aware of the benefits of investment in value addition activities and those farmers already investing in value addition should make use of the modern method of processing instead of the traditional practices which help to increase their income.

Abur (2014) carried out an assessment of poverty status among rice farmers in Guma Local Government Area of Benue State and posited that poverty continues to be a major problem in Benue state. The study used the simple percentage, Gini coefficient, Foster Greer Thorbecke and Bivariate logit regression techniques applied on a cross-sectional data of 95 rice farmers in the study area to analyze data. The result of the simple percentage, show that the majority of the farmers are aged 40-50. While the result of the Gini coefficient shows 0.04 which indicates a low income inequality among the rice farmers. The result of the Foster Greer Thorbecke shows that 60 per cent of rice farmers are below the poverty line. The results of the Bivariate logit regression techniques shows the likelihood of a rice farmer being poor is reduced with increase in the number of years of formal education, output per month and the income from rice and capital. The study concluded that there is a high level of poverty among the rice farmers in the study area. However, it recommended that increased government support through the provision of subsidy on major rice equipment and the provision of

production credit through public-private arrangement would go a long way to alleviate poverty among rice farmers in the area.

Theoretical Review

Theory of Basic Needs

The 'basic needs' approach was introduced by the International Labour Organization's World Employment Conference in 1976 (ILO, 1976). This conference proposed the satisfaction of basic human needs as the overriding objective of national and international development policy. According to this theory, a traditional list of immediate "basic needs" is food (including water), shelter, and clothing.

This theory posits the cost-of-basic-needs as determinant of poverty. This method stipulates a consumption bundle adequate for basic consumption needs, and then estimates its cost for each of the subgroups being compared in the poverty profile; this is the approach of Rowntree in his seminal study of poverty in York in 1901 and it has been followed since in innumerable studies for both developed and developing countries. This is called the "cost-of-basic-needs" method (CBN) (Olowa, 2012). One can interpret this method in two quite distinct ways. It can be interpreted as the "cost-of-utility", By the second interpretation, the definition of "basic needs" is deemed to be a socially determined normative minimum for avoiding poverty, and the cost-of-basic-needs is then closely analogous to the idea of statutory minimum wage rate. Poverty is then measured by comparing actual expenditures to the cost-of-basic-needs.

There are food and non - food components of cost-of-basic-needs with different computation. The food component of the poverty line is almost universally anchored on nutritional requirements for good health. To compute the food component of CBN a simple method is to set a bundle of goods in each region. One difficulty with the core basic needs method is the determination of the minimum requirement for the non- food needs. There are no agreed standards of needs for non -food items". This is because these non -food needs are determined by environmental conditions, as well as institutional structures, technology and customary modes of life. In order to compute non-food items the monetary value can be attached to most of the non-food items. But in using this method, it is necessary that the costs

of the non- food needs included should not be lower than the prevailing cost for such items, even when the minimum standards are not met (Olowa, 2012).

Methodology

This study adopted survey research design in analyzing the impact of rice production on poverty rates in Ushongo Local Government Area of Benue State. The nature of data required for the study were basically primary data, which were collected on the socioeconomic characteristics of the respondents – sex, marital status, age, educational background and number in households. The data were also collected on quantity of produced (rice output), income from rice farming activities and rice labour employment. The structural questionnaire were designed for data collection in the fieldwork. A total population of six hundred and twenty-eight (628) was arrived at through a Pre-Survey as revealed by the Benue State Agricultural and Rural Development Authority (BNARDA). A representative sample of 239 rice farmers in Ushongo LGA of Benue State studied in order to examine the impact of this farming activity on poverty rates in the study area.

Model Specification

This study adopted the logistic regression model used by Abur (2014), who analysed the effect of rice farming on poverty status of rice farmers in Guma LGA of Benue State. His model was stated thus:

$$ln\left(\frac{p}{1-p}\right) = Z = \alpha + \beta_i X_i + \mu_i \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots..(1)$$

Where Z is the probability, which measures the total contribution of the independent variables in the model and is dependent variable (poverty status), known as logit and is calculated as:

$$Z = \frac{Average\ Annual\ income\ of\ Household\ from\ farming\ activities}{Total\ number\ of\ days\ in\ a\ year\ (365\ days)} \dots\dots\dots\dots\dots.(2)$$

The explicit form of equation (3.4) is stated hereunder:

$$POV = \beta_0 + \beta_1 INC + \beta_2 RAC + \beta_3 ROT + \beta_4 EDU + \beta_5 AHF + \beta_6 NMD + \beta_7 HTP + \beta_8 ACT + \beta_9 EMP + \mu \dots \dots (3)$$

POV was coded as: poor = 1, if household earns less than US$1.5 per day (naira equivalent, i.e. ₦675, given that $1:₦450), non-poor = 0, if household earns more than US$1.5 per day (naira equivalent);

β_0 = constant or intercept of the model

β_i = (where i=1,2,3,4,5,6,7,8) parameters to be estimated

INC = Household income (income from rice production activities)

RAC = Rice producers' access to credit (1 if rice producer have access to credit, 0 if otherwise)

ROT = Rice Output (number bags of rice produced in a year)

EDU = Educational status of household (the total number of years all members of the household spent in a formal educational institution)

AHF = Access to health facilities (1 if household member visits modern health facility in the community, 0 if otherwise)

NMD = Number of meals taken per day (1 if household takes three-square meals per day, 0 if otherwise)

HTP = House type (1 if farmer lives in a zinc roof house, 0 if otherwise)

ACT = Access to clothing (coded as 1 if at least one new cloth is purchased in a year, 0 if otherwise),

EMP = Employment opportunity from rice production (1 if rice production is the main occupation of the respondent, 0 if otherwise)

Equation (3.3) was modified to include rice production components proxies used in the study as rice output (ROT), rice income (INC), rice labour employment (RLE) and quantity of rice milled (QRM). The functional form of the model was stated thus:

$$POV = (ROT, INC, RLE, QRM) \dots \dots (4)$$

Equation (3.6) is stated explicitly as:

$$POV = \beta_0 + \beta_1 ROT + \beta_2 INC + \beta_3 RLE + \mu \dots \dots (5)$$

POV=Poverty Status of Rice Farmers;

ROT = Rice Output;

INC = Rice Income;

RLE = Rice Labour Employment;

β_0 = Constant or intercept of the model,

β_i, (where i=1,2,3,4) parameters to be estimated,

u = Error term

POV is poverty status of rice producers; calculated as:

$$POV = \frac{Average\ annual\ income\ of\ respondent\ from\ rice\ production}{Total\ number\ of\ days\ in\ a\ year\ (365\ days)} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (6)$$

Results and Discussions

Model Estimation and Results

The logistic regression results are presented in Table 3.

Table 3: Logistic Regression Results

Variable	Coefficient	Std. Error	t-statistic	Prob.
ROT	-0.006077	0.00094	-6.445101	0.0000*
INC	-0.215252	0.08311	-8.862105	0.0002*
RLE	-0.706591	0.08538	-8.275462	0.0000*
C	0.814072	0.08876	9.171319	0.0000*

McFadden R-squared	0.760553	Mean dependent var	0.666667
S.D. dependent var	0.473381	S.E. of regression	0.270860
Akaike info criterion	0.649358	Sum squared resid.	8.143554
Schwarz Criterion	0.858419	Log likelihood	-29.96146
Hannan-Quinn Criter.	0.734259	Deviance	59.92291
Restri. deviance	152.7634	Restr. log likelihood	-76.38170
LR Statistic	72.84049	Avg. log likelihood	-0.249679
Prob. (LR Statistic)	0.000000		

Source: Researcher's Computations from Eviews 12

POV is dependent variable
* denotes significance at the 5 percent level.

The results shown in Table 3 are shown in the estimated model as:

$$POV = 0.814 - 0.006ROT - 0.215INC - 0.707RLE - 0.376QRM \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (7)$$

$$\begin{array}{ccccc} (0.089) & (0.001) & (0.083) & (0.085) & (0.061) \\ [9.171] & [-6.445] & [-8.862] & [-8.275] & [-6.208] \end{array}$$

Note: Standard errors are in parentheses while t-statistics are in square brackets.

Table 3 and Equation (1) display the results obtained from the logistic regression analysis on rice farmers in Ushongo LGA of Benue State. The obtained results revealed that rice output (ROT) has a negative impact on poverty rates as revealed by the coefficient of -0.006077. This negative coefficient (-0.006077), is in line with our *a priori* expectations. This implies that a one unit increase in rice output leads to 0.006077 decrease in the likelihood of being poor of farmers in the study area. The t-statistic value of -6.445 and the probability value 0.000 show that, the impact of ROT on POV is statistically significant at 5% level of significance.

Furthermore, Table 3 and Equation (1) revealed that income of rice farmers (INC) has a negative effect on poverty rates (POV) with a coefficient of -0.215252, which is in line with our *a priori* expectations. This result suggests that as the income of rice producers increases, there is a corresponding decrease in poverty rates. The negative coefficient of -0.215252 quantifies the strength and direction of this effect. Specifically, it indicates that for every unit increase in the income of rice producers, there is a 0.215252 unit decrease in the poverty rates. The t-statistic value of -8.862 and the associated probability value of 0.000 indicate that the effect of INC on POV is statistically significant at 5% level of significance.

Rice Labour Employment (RLE), exerts a negative impact on poverty rates as revealed by the coefficient of -0.706591. This result indicates that a unit increase in RLE results in a corresponding decrease of 0.706591 in the likelihood of individuals being classified as poor, and conversely, a decrease in RLE leads to an increase in the probability of poverty. The t-statistic figure of -8.275462, accompanied by a probability value of 0.0000, suggests that the influence of RLE on poverty is statistically significant at a 5% significance level.

The McFadden R-squared value of 0.760553, as presented in Table 3, provides a quantitative measure of the extent to which the independent variables - ROT, INC and RLE - account for the observed variations or changes in poverty among rice farmers in Ushongo. This value, which is proportionally 76.0553%, indicates that these aforementioned variables explain 76.0553% of the poverty-related dynamics in this study area. However, it is important to acknowledge that 23.9447%, of the variations in poverty cannot be attributed to the variables under consideration. Rather, this percentage (23.9447%) can be ascribed to other unidentified factors that are responsible for poverty, as well as to potential errors of aggregation and omission that may have occurred during the course of the study conducted in the specified area.

The Likelihood Ratio (LR) statistic value of 72.84049 with a probability value of 0.0000 shows that the test statistic is significant, which suggests element of joint effect by explanatory variables of the model. That is to say that the independent variables captured in the model are significant determinant of poverty rates among rice producers in Ushongo LGA of Benue State. The Akaike, Schwarz and Hannan-Quinn statistics are relatively low, suggesting that the model performs well in explaining the impact of rice production on poverty rates in Ushongo LGA of Benue State.

Discussion of Findings

The first objective was to examine the impact of rice output on the poverty rate in Ushongo Local Government Area (LGA) of Benue State. The results of the study unequivocally demonstrate that the rice output has a negative and statistically significant impact on poverty rates. Such a finding inherently implies that any increase in rice production would inevitably result in a notable decrease in poverty rates specifically amongst the rice farmers who constitute the focal point of this study. It is imperative to note that the remarkable findings of this study are profoundly aligned with the work of Okpe et al. (2014), and Anga and Abimiku (2021) who meticulously documented that the sheer quantity of rice that is expertly milled possesses an undeniable influence on the probability of a respondent transcending the confines of poverty.

The second objective of this study was to examine the impact of rice income on poverty rate in Ushongo LGA of Benue State. The results revealed that income of rice producers has a negative and statistically significant impact on poverty rates. This means that income of rice producers from rice production activities has the probability of reducing their likelihood of being poor. Essentially, the indication is that as the income obtained from activities related to the production of rice rises, the probability of rice producers facing poverty diminishes. This finding is consistent with that of Okpe et al. (2014) and Hussaini et al. (2020) who reported that annual income from rice milling is negative, correctly and statistically significant implying that a unit change (increase) in annual income of the sampled respondents from rice milling activity reduced their likelihood of being poor.

The third objective of this study was to examine the impact of rice labour employment on poverty rate in Ushongo LGA of Benue State. The results show that rice labour employment has a negative and statistically significant impact on poverty rates in the study area. Such a finding implies that any increase in rice labour employment will result to a notable decrease in poverty rates among the rice farmers in study area. The findings of this study are in agreement with the study of Anga and Abimiku (2021) who found that rice labour employment activities has statistically significant impact on poverty rates.

Conclusion and Recommendations

Conclusion

The findings of this study revealed that rice output (ROT) has a negative and statistically significant impact on poverty rate. The econometric analysis indicates that increases in ROT are associated with adverse impact on poverty rate in Ushongo Local Government Area of Benue State.

It can also be concluded that rice income (INC) has a negative and statistically significant impact on poverty rate. The econometric analysis indicates that increases in (INC) are associated with adverse impact on poverty rate in Ushongo Local Government Area of Benue State. This implies that income of rice producers reduces the probability of being poor of rice producers in the study area.

Finally, it can also be concluded that rice milling leads to increase rice value chain, which goes a long way to reduce the likelihood of being poor of rice producers. This suggests that government and private individuals should invest in the rice production value-chain by establishing rice mills in the study area.

Recommendations

Based on the findings of this study, the following recommendations were made.

i. Government and relevant stakeholders should encourage and support to increase rice produce. Policies and programmes should be implemented to support and incentivize increased rice production among farmers in the study area. This could include providing access to modern agricultural techniques, high-yield seeds, and irrigation systems to enhance productivity.
ii. There is every need to promote income-generating activities related to rice production, as the study found that rice income has reduced the poverty rates in the study area. Efforts should be made to diversify income sources for rice producers, such as promoting value-added activities like rice processing, packaging, and marketing. This can help increase the overall income of rice producers and subsequently reduce poverty rates.
iii. Government should enhance employment opportunities in the rice sector. Initiatives should be developed to create more employment opportunities within the rice sector, such as providing training programs for modern rice farming techniques, establishing cooperatives for collective farming, and supporting the development of small-scale rice processing enterprises.

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