



## Seasonal Poverty Incidence and Determinants among Vegetable Farm Households in Ogun State, Nigeria

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**Abstract:** Farmers are often prone to poverty due to low income and insufficient credit during production season. This study examined seasonal poverty incidence and determinants among vegetable farmers. Panel data were collected from 192 respondents through multistage sampling using structured questionnaire. Data were analysed using descriptive statistics, Foster-Greer-Thorbecke poverty index and Logit model. Poverty line shows that 67.2% of the respondents were poor during planting season and 25.5% during post-harvest season. The poor household heads include 51-60 years-old (90.9%), widow(er) (100%), those without formal education (100%), households with  $\geq 10$  members (100%) and those cultivating  $\leq 1.0$  hectare (90.0%). Logit model revealed that age, marital status and agricultural credit significantly reduced poverty at 5%, 10% and 1% respectively while sex (1%), low education (1%), farming experience (1%), farm size (5%) and dependency ratio (5%) influenced household poverty. Major production constraints include low market price (85%), agricultural credit (76.0%), pilferage (74.0%) and high input prices (73.4%). In conclusion, there is higher likelihood for farm households to be poor during planting season. Therefore, increased agricultural credit should be granted to farmers towards planting season. Modern inputs should be distributed effectively at affordable prices with extension services in order to reduce seasonal poverty.

**Keywords:** Poverty index; Vegetable farmers; Production season; Agricultural credit; farm households

**JEL Classification:** I32

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## 1. Introduction

Poverty is a situation of low income or consumption in which the poor are unable to have access to basic necessities of life including food, clothing, and decent shelter. It is a threat to human survival and powerfully affects the life of entire family (Joseph, 2010; Moshin, 2019). According to Abiola and Olaopa (2008), there is a rising profile of poverty in Nigeria which results in hunger, malnutrition, disease, poor access to credit facilities, low life expectancy and general level of human hopelessness in spite of the rich resource endowment in the country. The agricultural sector has the highest poverty incidence which is also a bane to the development of the sector. Because, the poor in the rural areas are primarily engage in subsistence agricultural farming activities such as fishing, mining, forestry and other related small-scale farm and non-farm enterprises and they depend solely common resources such as land and family labour (Kapur, 2019; Ogutu & Qaim, 2019). The study of Olorunsanya and Omotesho (2012) reported that total poverty in rural areas is more than 70% and this is where majority of the population live and engage in agricultural production as a major source of livelihood. The poor live in abject condition in Nigeria with high children mortality rate while life expectancy at birth is the 17<sup>th</sup> lowest in the world (Agu & Udoh, 2012). In spite of the huge human and material resources that have been devoted to poverty reduction by successive governments, the quantitative and qualitative evidences still reveal that poverty depth and severity is at high level in Nigeria (Sallawu *et. al.*, 2016).

The United Nations defined poverty as a denial of choices and opportunities, a violation of human dignity and lack of basic capacity to participate effectively in society. The poor households are also deprived sufficient access to school, health care, credit or loan, cultivable land or a viable livelihood source. The households live in marginal or fragile environments without access to clean water or sanitation and this means being susceptible to violence since extreme poverty may lead to death (Moshin Khan, 2019). In view of this, Nigeria as a developing country is faced with the challenge of feeding its fast growing human population (Jabo *et. al.*, 2017). The alleviation and eradication of poverty has remained a critical issue among countries of the world and it has also become the central goal and the top priority of the international development agenda (United Nation, 2015). Meanwhile, agriculture is critical to achieving global poverty reduction targets in most low income countries. Hence, there should be a broad-based poverty reduction and food security policies in Africa which must focus on small-holder rural farmers (Okpachu *et. al.*, 2017). Because, these small-holder farmers are often prone to seasonal poverty particularly during planting season due to lack of access to sufficient fund or credit for farming activities. However, transitory poverty has been defined as a sudden change in poverty status which is the inability to meet subsistence needs due to a short term fall in income or food expenditure in spite of the fact that the household might be non-poor over a long time. The rural people face a high risk of food insecurity during planting season with many barriers to consumption and self-sufficiency, which create shortcoming and

crisis within rural families (Akanbiemu *et. al.*, 2016; Gazuma, 2018). Hence, they are often in need of productive assets required to maximize their income and are constrained with the access to land, labour, material inputs, irrigation and financial services.

#### The Objectives of the Study

The specific objectives of the study are to:

- i. Assess the poverty status of the vegetable farmers during planting and post-harvest seasons,
- ii. Describe the poverty profile of the farm households,
- iii. Estimate the cost and returns of vegetable farm in the area, and
- iv. Examine the determinants of seasonal poverty among the farm households;

## 2. Literature Review

The study of Fosu (2017) revealed that the major factor influencing the poverty status of a household is average income. Thus, poverty will reduce and more progress will be achieved with even distribution of income. Olowa (2012) specifically identified the causes of poverty in Nigeria to include low economic growth, unemployment, low productivity and wages, economic degradation, crime and violence, workers' retrenchment among other factors. Ucha (2010) argued that unemployment among graduates, non-diversification in the economy, corruption in public offices, inequality in income, low quality of education and idleness are the key factors affecting poverty in Nigeria. He buttressed that these various causes of poverty reinforce each other and must be tackled together for progress to be made.

The study of Adeleye *et al.* (2020) showed that growth rate in income inequality increases poverty while economic growth reduces the bane. The study concluded that income inequality is a significant determinant of poverty and this can only be resolved by equitable income distribution. In the same vein, Ogbeide and Agu (2015) established a direct relationship between poverty and income inequality. They suggested that employment should be used as a major instrument in fighting poverty and income inequality in Nigeria. Anyanwu (2013) examined the factors that significantly contributed to the poverty status of households which include household size, low education and marital status while residency in the urban area, education above secondary level as well as age reduced the tendency of being poor. The findings of Ogundipe *et al.* (2016) showed that food productivity index negatively and significantly affects poverty indicators in Nigeria between 1991 and 2015. Dada and Fanowopo (2020) affirmed that both economic growth and strong institutions are significant factors that can be used in reducing poverty in Nigeria while Aiyedogbon

and Ohwofasa (2012) acclaimed that poverty level in Nigeria is influenced by the contribution of unemployment, high population growth and services to real Gross Domestic Product (GDP).

Kaka (2013) argued that women were severely challenged by poverty as it relates to lack of income, low access to land and properties which reduce their access to opportunities from governments and international communities. Therefore, there is a need to empower more women to participate in decision making in order to foster a sustainable development in the nation (Ighodalo, 2012). In a review, however, Addae-Korankye (2014) identified the causes of poverty to include corruption, poor governance, inadequate opportunities in employment, poor use of resources and infrastructure, inadequate policies, wars and conflicts in Africa.

### **3. Research Methodology**

#### **3.1. The Study Area**

The study area is Ogun State in the Southwestern part of Nigeria. The region is located in Latitude 6<sup>0</sup>N and 8<sup>0</sup>N and Longitude 2½<sup>0</sup>E and 5<sup>0</sup>E. It is bordered by the Republic of Benin on the West, Ondo State on the East, Oyo and Osun State in the North and to the south are Lagos state and Atlantic Ocean. Ogun State covers about 16,762 square meters which is approximately 1.82% of Nigeria land mass. The population figure is 2,358,570 in 2006 and it is the 19th largest State accounting for about 2.46% of Nigeria total population (NPC, 2007).

Ogun State is divided into four Agricultural zones namely, Ijebu, Ikenne, Egba and Ilaro Agricultural zones which are under the administration of the Ogun State Agricultural Development Programme (OGADEP). There are two distinct seasons namely, the rainy season, which lasts from March/April to October/November and the dry season, which lasts between October/November and March/April. The temperature is relatively high during the dry season (mean is 30°C). Low temperatures are experienced during the rains, especially between July and August. At this time, the temperatures could be as low as 24°C. The distribution of rainfall varies between 1000 mm and 2000 mm. The type of vegetation is the tropical rain forest. The favourable climatic conditions enable the production of arable crops including maize, yam, rice, plantain as well as fruits and vegetables among others. Permanent crop and livestock production are also predominant in the State. The natural resource endowment includes land, water, mineral, forest and agricultural resources from which a wide range of agricultural and forest products are available.

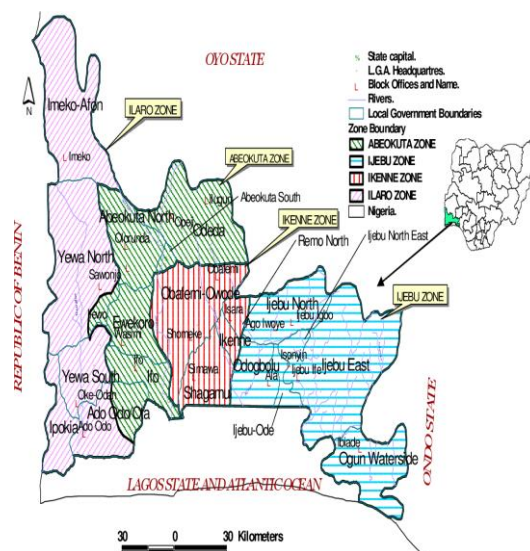


Figure 3.1. Map of Ogun State showing the four Agricultural Zones

### 3.2. Method of Data Collection and Sampling Techniques

Primary data were collected from the household heads through the use of structured questionnaire that was administered by personal interview schedule. Information was collected on socioeconomic and household characteristics including age, occupation, sex, household size, marital status, farming experience, monthly income and so on.

A multistage sampling technique was used in selecting the respondents for the study. In the first stage, two (2) Agricultural Zones in Ogun State namely; Ilaro and Ikenne Agricultural zones were purposively selected. In the second stage, two (2) blocks were selected from each Agricultural Zone based on predominant vegetable production while six (6) cells were selected from each Agricultural block totaling twenty four (24) cells. Subsequently, an average of eight (8) vegetable farming household was interviewed in each cell give a total of one hundred and ninety two (192) farm households. Panel data collected from during planting and post-harvest seasons were analysed for the study.

### 3.3. Method of Data Analysis

The socioeconomic characteristics of the respondents and their farming systems were analysed using descriptive statistics mainly frequency tables, percentages, mean and standard deviation. The household poverty profile was captured by estimating the poverty indices against the socioeconomic characteristics of the respondents including age, sex, marital status, education, household size, farming experience and farm size

using the Foster-Greer-Thorbecke poverty measure which was developed by Foster *et al* (1984) and analysed by Foster and Shorrocks (1991) as follows;

$$P_{\alpha} = \frac{1}{n} \sum_{i=1}^q \left( \frac{Z - y_i}{Z} \right)^{\alpha}$$

Where;  $\alpha$  = Poverty aversion parameter

n = Total number of households in the sample,

q = Total number of poor households,

Z = Poverty line and  $y_i$  = Income of households below poverty line  $i = 1, 2, \dots, q$ . The head count ratio index measuring the poverty incidence is given as;

$$\alpha = 0 \rightarrow P_0 = \frac{q}{n}$$

The poverty gap that estimates the average distance separating the poor from the poverty line could be understood as the amount of income transfer that is needed to close up the gap (Hagos and Holden, 2002). This is measured as;

$$\alpha = 1 \rightarrow P_1 = \frac{1}{nz} \sum_{i=1}^q (Z - y_i).$$

Measure of poverty severity is given as;

$$\alpha = 2 \rightarrow P_2 = \frac{1}{nz^2} \sum_{i=1}^q (z - y_i)^2$$

$P_2$  takes into account the distance separating the poor from the poverty line and inequality among the poor.

### 3.4. Assessment of Poverty Status of the Rural Farming Households

Poverty line was constructed from households' food expenditure and used to determine the poverty status of the vegetable farm households in the study area. The poverty line was estimated as the average per capital expenditure which has been considered more appropriate in past studies (Omotesho *et al.*, 2010; Ahmed *et al.* 2015; Okpachu *et al.*, 2017). The poverty line was defined as the two-thirds (2/3) of the mean value of per capita consumption expenditure in the area. Thus, households whose mean consumption expenditure falls below the poverty line are regarded as being poor while those with their expenditure above the benchmark are non-poor (Fapojuwo *et al.*, 2012). The estimates were computed as follows;

$$PCE = \frac{TCE}{HHS}$$

$$MPCHE = \frac{THHE}{TNR}$$

$$PL = \frac{2}{3} \times MPCHE$$

Where:

PCE = Per Capita Expenditure

TCE = Total Consumption Expenditure

HHS = Household Size

MPCHE = Mean Per Capita Households Expenditure

THHE = Total Households Expenditure

TNR = Total Number of Respondent

PL = Poverty Line.

### 3.5. Determinants of Seasonal Poverty among the Vegetable Farmers

Logit model was used to analyse the determinants of poverty among the vegetable farming households. The dependent variable takes the value '1' if household is poor and '0' if non-poor. The Logit model is estimated following Ahmed *et al.* (2015) and the equation is given as follows:

$$P\left(Y_i = \frac{1}{x_i}\right) = \frac{\exp(x_i\beta)}{1 + \exp(x_i\beta)}$$

This can be expressed as,

$$q_{it} = \beta x_{it} + \varepsilon_{it}$$

Where:

$q_{it}$  = an unobservable latent variable for poor households.

$x_{it}$  = vector of explanatory variables

$\beta$  = vector of parameter to be estimated

$\varepsilon_{it}$  = error term

The observed binary (1, 0) for whether household is poor or otherwise is assumed in the usual Logit model. The probability that the binary assumes the value 1 implies,

$$prob(q_{it} = 1) = \frac{e^{x_{it}} + \beta^{x_{it}}}{1 + e^{x_{it}} + \beta^{x_{it}}}$$

The dependent variable Y = (1, if household is poor; 0, if household is non-poor)

The estimating equation of the logit model is given as;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \dots + \beta_n X_n + \epsilon_i$$

Where the explanatory variables are:

X<sub>1</sub> = Age of household head (years)

X<sub>2</sub> = Sex of household head (male =1, female = 0)

X<sub>3</sub> = Educational level (years of formal education)

X<sub>4</sub> = Marital status of household head (1, if married; 0, if otherwise)

X<sub>5</sub> = Migration status (1, if indigene of the farming community; 0, if otherwise)

X<sub>6</sub> = Household size (numbers)

X<sub>7</sub> = Experience in vegetable farming (years)

X<sub>8</sub> = Farm size (ha)

X<sub>9</sub> = Extension agent visitation (number)

X<sub>10</sub> = Dependency ratio

X<sub>11</sub> = Amount of credit obtained (₦)

X<sub>12</sub> = Participation in Cooperative society (1, if participating, 0 if otherwise)

## 4. Results and Discussion

### 4.1. Poverty Status of the Vegetable Farmers

The poverty status of the farmers was estimated during planting and post-harvest seasons as presented in Table 1. The mean per capita household expenditure (MPCHE) was ₦ 6,953.28 during planting season and ₦ 17,593.41 during post-harvest season while the poverty line was ₦8,182.23. Thus, the proportion of the poor households was high (67.2%) during planting season and low (25.5%) during post-harvest season. Majority of the farm households was possibly poor due to huge funds required to purchase farm inputs at the detriment of household food consumption. Meanwhile, there was inadequate access to agricultural credit.



**Table 1. Poverty Status of the Farm Households during Production Season**

| Poverty Status                                | Planting season | Post-harvest season |
|---|-----------------|---------------------|
| Poor  | 129 (67.2%)     | 49 (25.5%)          |
| Non-poor                                      | 63 (32.8%)      | 143 (74.5%)         |
| Mean per capita household expenditure (MPCHE) | ₺ 6,953.28      | ₺ 17,593.41         |
| Poverty Line (2/3 of MPCHE for all seasons)   | ₺ 8,182.23      |                     |

*Source: Field survey, 2020*

#### 4.2. Poverty Profile of the Vegetable Farming Households

The poverty profile and mean per capita expenditure of the respondents are shown in Table 2. The index revealed that household heads between 51-60 years-old had the highest proportion (90.9%) of those that were prone to poverty incidence while 47.8% of, at least, 60 years-old were below the poverty line. The low percentage of the aged group was probably due to remittances received from their adult children who were high income earners. Poverty incidence was most prominent (100%) among female headed households while 74.0% of male headed households were poor. This could imply some men worked for longer hours to earn higher income than women. However, all households (100%) headed by widow(ers) were prone to poverty incidence while every single headed household was above the poverty line. This could be attributed to less financial burden on either a spinster or bachelor compared to single parents. More so, all household heads without formal education (100%) were prone to poverty incidence while those with, at least, Higher National Diploma were non-poor. It means that higher education promotes poverty alleviation possibly through adoption of modern innovation and farm commercialization which enhance the capacity to earn higher income.

All households (100%) with, at least, 10 members were vegetating below poverty line while 58.8% of families with, at most, 6 members were living above the poverty line. This is an indication that a larger household has the likelihood of being poor. Furthermore, household heads with less than 10 years of farming experience constituted the least proportion (68.8%) of farmers in poverty chain while those within 11-20 years of experience had the highest proportion (88.8%) of those in poverty chain. This could be attributed to risk aversion attitude by the less experienced farmers while the other categories were confronted with overwhelming production risks which such climatic change and crop failure. Among tye farmers, the highest proportion (90.0%) that cultivated less than 1.0 hectare were prone to poverty incidence while only 41.7% that cultivated 2.0-3.0 hectares were poor. This implies that the farmers should cultivate 3.0 hectare to ensure poverty alleviation within the farm households.

**Table 2. Distribution of Households by their Poverty Profile**

| Characteristics     | Per capita Food Expenditure (₦) per month | US Dollar (\$) per day | Poverty Incidence (P <sub>0</sub> ) | Poverty Depth (P <sub>1</sub> ) | Poverty Severity (P <sub>2</sub> ) |
|---------------------|---|------------------------|-------------------------------------|---------------------------------|------------------------------------|
| Age                 |   |                        |                                     |                                 |                                    |
| Below 30 years      | 6,666.19                                  | 0.4825                 | 0.8889                              | 0.3380                          | 0.1468                             |
| 31 – 40 years       | 8,170.62                                  | 0.5914                 | 0.7895                              | 0.3907                          | 0.2190                             |
| 41 – 50 years       | 6938.88                                   | 0.5023                 | 0.8571                              | 0.3015                          | 0.1388                             |
| 51 – 60 years       | 6,054.22                                  | 0.4382                 | 0.9091                              | 0.3687                          | 0.2001                             |
| Above 60 years      | 8,169.46                                  | 0.5914                 | 0.4783                              | 0.1864                          | 0.0847                             |
| Sex                 |   |                        |                                     |                                 |                                    |
| Male                | 7,429.42                                  | 0.5378                 | 0.7403                              | 0.3039                          | 0.1529                             |
| Female              | 4,278.33                                  | 0.3097                 | 1.0000                              | 0.5246                          | 0.3433                             |
| Marital status      |   |                        |                                     |                                 |                                    |
| Single              | 12,428.57                                 | 0.8997                 | 0.0000                              | 0.0000                          | 0.0000                             |
| Married             | 7,304.77                                  | 0.5288                 | 0.7564                              | 0.3112                          | 0.1579                             |
| Widow/<br>widower   | 2,700.00                                  | 0.1954                 | 1.0000                              | 0.7000                          | 0.4900                             |
| Education level     |   |                        |                                     |                                 |                                    |
| No formal Education | 3,513.04                                  | 0.2543                 | 1.0000                              | 0.6097                          | 0.4019                             |
| Primary             | 8,893.84                                  | 0.6438                 | 0.6098                              | 0.2280                          | 0.1089                             |
| Secondary           | 5,356.22                                  | 0.3877                 | 1.0000                              | 0.4049                          | 0.1974                             |
| NCE/OND             | 2,827.78                                  | 0.2047                 | 1.0000                              | 0.6858                          | 0.4707                             |
| HND/B.Sc            | 1,1475.00                                 | 0.8306                 | 0.0000                              | 0.0000                          | 0.0000                             |
| Household size      |   |                        |                                     |                                 |                                    |
| 1 – 3               | 7,562.10                                  | 0.5474                 | 0.7576                              | 0.3745                          | 0.2090                             |
| 4 – 6               | 7,557.05                                  | 0.5470                 | 0.8148                              | 0.2469                          | 0.1096                             |
| 7 – 9               | 6,768.69                                  | 0.4900                 | 0.5882                              | 0.2797                          | 0.1434                             |
| ≥ 10                | 4,042.86                                  | 0.2926                 | 1.0000                              | 0.5508                          | 0.3034                             |
| Farming experience  |   |                        |                                     |                                 |                                    |
| ≤ 10 years          | 9,468.26                                  | 0.6854                 | 0.6800                              | 0.2583                          | 0.1158                             |
| 11-20 years         | 4,663.11                                  | 0.3375                 | 0.8889                              | 0.4982                          | 0.3058                             |
| 21-30 years         | 7,264.36                                  | 0.5258                 | 0.8182                              | 0.2478                          | 0.1055                             |
| Above 30 years      | 6,538.69                                  | 0.4733                 | 0.7500                              | 0.3144                          | 0.1632                             |
| Farm size           |   |                        |                                     |                                 |                                    |
| Below 1ha           | 5,607.97                                  | 0.4059                 | 0.9000                              | 0.4189                          | 0.2320                             |
| 1- < 2 ha           | 8,738.81                                  | 0.6326                 | 0.7500                              | 0.2504                          | 0.1063                             |
| 2- < 3 ha           | 8,005.61                                  | 0.5795                 | 0.4167                              | 0.1820                          | 0.0826                             |
| Above 3 ha          | 6,825.36                                  | 0.4941                 | 0.6667                              | 0.3686                          | 0.2422                             |

Source: Field survey, 2020

### 4.3. The Cost and Returns of Vegetable farming in the Area

The mean quantity of input, cost, depreciation value, revenue and farm income were estimated (farm income is equal to total revenue minus total cost). The estimates show that the average cost of vegetable production, revenue and farm income were ₦55,765.84, ₦196,014.68 and ₦140,248.85 respectively in the study area. Tete (amarantus sp.) contributed the highest percentage to revenue followed by Ewedu (corchorus sp.) and tomato at 39.6%, 31.2% and 21.4% respectively. Soko (celosia sp.) contributed the least 3.7% to revenue. The result shows that vegetable farming is a lucrative enterprise.

**Table 3. Estimates of Cost and Returns Per Hectare Among the Vegetable Farmers**

| Variable Input                  | Quantity of Input | Cost per Unit ₦ | Cost of Inputs ₦ | Revenue ₦  | % of Revenue |
|---------------------------------|-------------------|-----------------|------------------|------------|--------------|
| Ewedu (corchorus sp.) kg        | 9.0               | 740.72          | 7015.09          | 61,262.41  | 31.2         |
| Tete (amarantus sp.) kg         | 3.9               | 850.06          | 3460.09          | 77,636.66  | 39.6         |
| Soko (celosia sp.) kg           | 4.9               | 459.14          | 2377.47          | 7,253.68   | 3.7          |
| Tomato kg                       | 7.4               | 149.72          | 1170.69          | 41,868.53  | 21.4         |
| Pepper kg                       | 3.6               | 306.76          | 1170.69          | 7,993.41   | 4.1          |
| Fertilizer (kg)                 | 120.8             | 70.68           | 8990.90          |            |              |
| Pesticide (litre)               | 2.7               | 170.24          | 471.01           |            |              |
| Herbicide(litre)                | 4.9               | 604.68          | 3133.48          |            |              |
| Tractor operations              | 2.9               | 4497.21         | 11710.65         |            |              |
| Land clearing (manday)          | 4.1               | 443.65          | 2282.76          |            |              |
| Ridge making (manday)           | 5.2               | 408.69          | 2486.44          |            |              |
| Planting (manday)               | 4.9               | 189.05          | 2334.44          |            |              |
| Weeding (manday)                | 4.0               | 205.30          | 2091.43          |            |              |
| Fertilizer application (manday) | 8.1               | 56.43           | 934.71           |            |              |
| Harvesting (manday)             | 6.3               | 257.83          | 3385.80          |            |              |
| Depreciation value              |                   |                 | 2750.23          |            |              |
| Total                           |                   |                 | 55765.84         | 196,014.68 | 100%         |
| Farm Income                     |                   |                 |                  | 140,248.85 |              |

*Source: Field survey, 2020*

### 4.4. Determinants of Poverty among the Farm Households

The determinants of poverty status of the respondents during the production seasons were assessed using the Logit regression model and the result is presented in Table 4. The Chi-square values for planting season (153.125) and for harvesting season (216.463) indicate that the model has goodness of fit to the study data at 1% level of significance. The planting season estimates are selected as the lead equation for

interpretation since majority 67.2% was poor which is higher than 25.5% in post-harvest season.

The coefficient of age (-0.386) shows that the variable had a significant (5%) reducing effect on poverty at 5%. This implies that majority of the vegetable farmers were young, active and agile for vegetable farming activities. The coefficient of sex had positive and significant (1%) relationship (3.181) with the status of being poor during planting. Thus, sex had an effect probably because the female members of the households were active in marketing activities of vegetable and could make higher profit than the male. Education (0.214) had positive and significant relationship with poverty at 1% showing that low level of formal education affected the farmers while the level of extension training was also very low. Though, education is very important in understanding the procedures and farm setting for a profitable vegetable production. Marital status (-1.139) significantly reduced household poverty at 10% during planting season probably due to the supply of cheap labour from married home. Experience (1.777) in vegetable farming significantly increased the likelihood of being poor at 1%. This implies that majority of the farmers had inadequate understanding of the farm setting and modern practices as well as marketing strategies. Though, there was little or no extension training to enhance their knowledge about the vegetable farming system.

Farm size (0.856) significantly promoted the likelihood of being poor at 5% probably due to small farm size and traditional farm practices among the farmers since small farm-holding would have a limiting effect on efficient resource utilization. Dependency ratio i.e. number of income earners within household (4.338) had a positive and significant relationship with poverty at 5% during planting season. This implies that dependants were more than income earners thereby reducing the per capita food expenditure leading to poverty. A significant negative relationship existed between credit obtained (-5.826) and poverty at 1% indicating that adequate amount of credit will reduce the financial burdens and alleviate poverty during the planting season since a household may suffer in a bid to spend household income on production activities at the detriment of food consumption and health care

**Table 4. Estimates of Logit Model for the Determinants of Poverty among the Respondents**

| Explanatory Variables                | Planting Season       |              | Post -harvest Season |              |
|--------------------------------------|-----------------------|--------------|----------------------|--------------|
|                                      | Coefficients          | Significance | Coefficient          | Significance |
| Constant                             | 7.989**<br>(4.0376)   | 0.048        | -6.698**<br>(4.5890) | 0.012        |
| Age                                  | -0.386**<br>(0.1530)  | 0.012        | 0.471<br>(0.3306)    | 0.154        |
| Sex                                  | 3.181***<br>(1.2094)  | 0.009        | -3.534**<br>(1.5667) | 0.024        |
| Educational Level                    | 0.214***<br>(0.0794)  | 0.007        | 0.117<br>(0.1763)    | 0.507        |
| Marital status                       | -1.139*<br>(0.6795)   | 0.094        | 3.391***<br>(0.9121) | 0.000        |
| Migration status                     | -1.004<br>(0.8809)    | 0.254        | 6.812***<br>(2.2948) | 0.003        |
| Household size                       | 0.065<br>(0.5527)     | 0.907        | -1.929*<br>(1.0696)  | 0.071        |
| Experience in vegetable farming      | 1.777***<br>(0.5030)  | 0.000        | 1.775**<br>(0.9050)  | 0.050        |
| Farm size (ha)                       | 0.856**<br>(0.4211)   | 0.042        | -0.143<br>(0.5265)   | 0.786        |
| Number of extensions visit           | 0.686<br>(2.9173)     | 0.814        | -1.267<br>(2.5647)   | 0.621        |
| Dependency ratio                     | 4.338**<br>(1.7815)   | 0.015        | -6.004*<br>(3.3531)  | 0.073        |
| Amount of credit obtained            | -5.826***<br>(1.7810) | 0.001        | 5.013<br>(3.7928)    | 0.186        |
| Participation in cooperative society | 0.356<br>(0.5870)     | 0.556        | 0.001***<br>(0.0008) | 0.003        |
| Pearson Chi-square                   | 153.125***            |              | 216.463**<br>*       |              |
| Log Likelihood                       | -39.255               |              | -21.954              |              |

Source: Field survey, 2020. Standard error in parentheses, 1% significant\*\*\*, 5% significant\*\*, 10% significant\*

#### 4.5. Sources of Finance Accessed by the Vegetable Farmers

The source of finance for the purpose of vegetable production is presented in Table 5. The results show that the highest agricultural loan were obtained from Cooperative societies (N68,177.08) while friends or relation offered the least average agricultural credits of N6,259.00 to the vegetable farmers. Though, cooperative societies may not

be able to meet the financial burden or volume of loan requested by members during the planting season.

**Table 5. Amount of fund Available to Vegetable Farmers**

| Source of fund       | Minimum   | Maximum    | Mean        | Std. Deviation |
|----------------------|-----------|------------|-------------|----------------|
| Personal Savings     | 20,000.00 | 250,000.00 | ₦37, 891.09 | 50,838.98      |
| Friends and relation | 5,000.00  | 50,000.00  | ₦ 6,259.00  | 5,180.01       |
| Cooperative Society  | 50,000.00 | 150,000.00 | ₦ 68,177.08 | 38,453.54      |
| Microfinance         | 50,000.00 | 100,000.00 | ₦ 59,322.92 | 31,361.93      |
| Local Finance Group  | 10,000.00 | 50,000.00  | ₦ 15,520.83 | 5,089.73       |

Source: Field survey, 2020

#### 4.6. The Constraints Faced by the Vegetable Farmers

The constraint confronted by majority of the farmers is low market price and demand for vegetable (85. (%), followed by inadequate agricultural credit (76.0%), pilferage or theft (74.0%) and high cost of input (73.4%) as presented in Table 6. These major challenges possibly contributed to poverty incidence experienced by the farm households. Other challenges that must be resolved include transportation of goods from farm (69.3%) and pest and diseases on the farm which sometimes lead to crop failure.

**Table 6. Distribution of Production Constraints by the Vegetable Farmers**

| Constraint                              | Yes (%)    | No (%)     | Rank | Mean | SD   |
|---|------------|------------|------|------|------|
| High cost of input                      | 141 (73.4) | 51 (26.6)  | 4th  | 1.74 | 0.44 |
| Attack of pest, diseases / crop failure | 130 (67.7) | 62 (32.3)  | 6th  | 1.69 | 0.47 |
| Inadequate farm land                    | 107 (55.7) | 85 (44.3)  | 7th  | 1.56 | 0.50 |
| Low market price or demand              | 165 (85.9) | 27 (14.1)  | 1st  | 1.87 | 0.34 |
| Ill-health among farmers                | 78 (40.6)  | 114 (59.4) | 8th  | 1.40 | 0.49 |
| Pilferage or theft                      | 142 (74.0) | 50 (26.0)  | 3rd  | 1.74 | 0.44 |
| Inadequate agricultural credit/ funds   | 146 (76.0) | 46 (24.0)  | 2nd  | 1.76 | 0.43 |
| Transportation of goods from farm       | 133 (69.3) | 59 (30.7)  | 5th  | 1.70 | 0.46 |

Source: Field survey, 2020

## 5. Conclusion

This study have shown that mean per capita household expenditure (MPCHE) of ₦ 6,953.28 was lower than the poverty line of ₦8,182.23 thereby exposing 67.2% of the farm households to poverty during planting season while MPCHE was higher at ₦ 17,593.41 during post-harvest season with only 25.5% of the household being poor. This shows an evidence of seasonal poverty. Majority of the household heads were vegetating below the poverty line during planting season including 51-60 years-old (90.9%), female (100%), widow/widower (100%), those without formal education (100%), households with  $\geq 10$  members (100%) and those cultivating  $\leq 1.0$  hectare (90.0%). However, an average farm income of ₦140,248.85 per ha between 2-3 months revealed that vegetable farming is profitable in the area.

The significant factors influencing the likelihood of being poor during the planting season include sex (1%), low education (1%), farming experience (1%), farm size (5%) and number of income earners in within the household (5%). Meanwhile, age, marital status and agricultural credit significantly reduced household poverty at 5%, 10% and 1% respectively. The constraints confronted by majority of the farmers were low market price for vegetable products (85.9%), agricultural credit (76.0%), pilferage/ theft (74.0%) and high cost of input (73.4%). These major challenges possibly contributed to poverty incidence experienced by the farm households. Other challenges include transportation of goods from farm (69.3%) and pest and diseases that lead to crop failure among few farmers.

In conclusion, evidences have shown that the vegetable farmers were prone to seasonal poverty as a result of inadequate fund to cope with household food consumption and investment in agricultural production during planting season. Therefore, it is recommended that government and stakeholders should design a workable policy to enhance access to increased agricultural credit by farmers towards the planting season. The farmers should increase their participation in cooperative societies so as to have access to loan at low interest rate. Distribution of modern inputs should be promoted to ensure adequate and timely delivery at affordable price, maybe at a designated agro-service center. Extension services should also be improved to promote farmers' education in agricultural innovations in order to reduce household poverty.

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