EFFECT OF SOCIO-ECONOMIC FACTORS ON WOMEN GINGER FARMERS' POVERTY STATUS IN SAMARU ZONE OF KADUNA AGRICULTURAL DEVELOPMENT PROJECT, NIGERIA

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Abstract

The study focused on the effect of socio-economic factors on poverty status of women ginger farmers in Samaru zone of Kaduna Agricultural Development Project (KADP), Kaduna State. A multi-stage sampling technique was used to select 205 women ginger farmers. Primary data were collected from the respondents with the aid of a structured questionnaire. Data were analysed using Foster Greer Thorbecks Indices and probit regression. The results show that 74% of the women ginger farmers were less than 50years of age, majority (76%) of the farmers had one form of formal education or the other, the household size with 6-10 persons were majority (56.1%) and78% of the farmers had farming experience of between 1-20 years while about 65% had farm sizes that range from 0.1-1.0 hectare. Women ginger farmers who were non-poor constituted 62.4% while the Poverty incidence was 37.6%, Poverty Gap was 13.7% and Poverty Severity was 6.5%. The socio-economic factors that influenced women ginger farmers' poverty status were educational level, farming experience, and farm size. The study recommends that policymakers and managers of poverty alleviation programmes should identify the poor at community levels so as to direct poverty alleviation project towards them and also, since poverty status decreases with increase in education level, there is need to give women ginger farmers the best needed educational assistance and innovation in ginger production.

Keywords: Poverty, Women, Ginger, KADP, Kaduna State.

Introduction

Nigeria is one of the poorest countries in the world, with over 80 million or 64% of her population living below poverty line. The situation has not changed over the decades but is increasing. Poverty and hunger have remained high in rural areas, remote communities and among female-headed households and these cuts across the six geopolitical zones of the country, with prevalence ranging from approximately 46.9 percent in the South to 74.3% in North (Opejobi,2016). The poverty experienced by Nigerians is pervasive, multifaceted and chronic, affecting the lives of a large proportion of the populace. In recognition of the incidence and severity of poverty, successive Nigerian government administrations has attempted to alleviate poverty among Nigerians through various programmes in agriculture, health, transport, housing and financial sectors. Some of these programmes in agriculture include; National Economic Empowerment Development Strategy (NEEDS), Root and Tuber Expansion Programme (RTEP), Agricultural Transformation Agenda (ATA), The Green Alternative, among others.

According to United Nations Multidimensional Poverty Index Report for June 2015, North-West Nigeria has the highest rate of poverty and Kaduna state being one of the states in the

region has 56.5% rate of poverty (Global Multidimensional Poverty Index, 2015). Various government interventions towards poverty alleviation have been replicated both at the state and local government levels which are usually packaged and delivered through agricultural sector.

Nigeria is basically an agrarian economy with about 85% of the population depending on agriculture. Agriculture is a fundamental instrument for stemming and reversing the worsening poverty, food insecurity and natural resources degradation trends (Asogwa*etal*., 2012). Agriculture provides food, employment to about 75% of the nation's population, income to farming households as well as being a major source of foreign exchange earnings. Generally, women play a crucial role in farming and it is estimated that about 60 percent of agricultural production activities are carried out by women in the continent of Africa.

Ginger (*Zingiber officinale*) is a herbaceous perennial grown as an annual for its spicy underground *rhizomes or stems*. It belongs to the family of *Zingiberaceae*. It is a slender perennial plant with thick and branched underground stem (rhizome). It is a spice grown across many climates in the world. In the world market, the current major five exporting countries have been China, India, Nigeria, Germany and Netherlands (Workman, 2016).

Nigeria ginger crop production for the year 2015-2016 is estimated to be 210,000 metric tonnes (Royal Spices, 2016). About 10% of the produce is consumed locally as fresh ginger while the remaining 90% is dried for both local consumption and export. According to Ezeagu (2006) 20% of the dried ginger is consumed locally for various uses and 80% is exported. Traditionally, ginger is used in Nigeria for both medicinal and culinary (kitchen) purposes as well as in confectionery industry. Ginger throughout the world is used as a spice or fresh herb in cooking and a range of other value-added products including flavouring in candies and beverages. In both modern and traditional medicine ginger has been used in treating health problems such as nausea in pregnancy, motion sickness, prevention of diabetes, cold/flu prevention and treatment, menstrual cramp relief, digestive problems, fights ovarian cancer and migraine relief. It also serves as antibiotics. The oil property in Ginger can help relief arthritis due to its anti-inflammatory properties. Young rhizomes that are harvested early are also used in pickles and confectionary (Ezeagu, 2006).

Most women in Nigeria, as in other developing economies, fall within the underprivileged class, that is, the poor and the downtrodden masses (Umar, 2015). This is evident in the conditions of life of women in Nigeria's rural areas where poverty is most prevalent.

Since women participate greatly in agricultural activities and studies have shown that ginger production is profitable, therefore women participation in ginger production will go a long way to alleviate their poverty.

In Nigeria, poverty for long has been a major contending force against the pace of development. It has remained persistent despite many laudable initiatives geared towards poverty alleviation. The continuous rise in the level of poverty in Nigeria has shown that more of the country's population lives in chronic poverty (NBS, 2012).

The concern over poverty and the need to alleviate it is due to the fact that poverty is a social phenomenon with negative consequences such as hunger, malnutrition, disease, unemployment, and increase in the number of destitute, increase in infant, child and maternal mortality rates. Agriculture has been identified as an instrument of poverty alleviation and the active role of women in this process is adequately recognized. Recently ginger production has been promoted and specifically in this area of Kaduna State by the Bank of Agriculture as an interventionist strategy to poverty alleviation.

There is little information on ginger production and poverty reduction of the farmers in the study area being the highest producers of ginger in the country and more especially there is little empirical evidence on ginger production on poverty alleviation among women ginger farmers who make up 40% of the total ginger producers in the study area.

The main objective of this study is to analyse effect of socio-economic factors on women ginger farmers poverty status while the specific objectives were to:

i. describe the socio-economic characteristics of ginger women farmers in the study area;
ii. estimate the poverty status of ginger women farmers in the study area and
iii. determine the effect of socio-economic characteristics on ginger women farmers poverty status.

METHODOLOGY

Kaduna State is one of the 36 states in the Federal Republic of Nigeria. The administrative divisions called Local Government Areas, that constitute the State rose from seven when Katsina State was carved out in 1987 to 13 in 1989, to 18 in 1991 and then 23 in 1996 (Kaduna State statistical year book, 1996). It is situated between latitude $9^0 2'$ N, $11^0 35'$ N and between longitude $7^0 15'$ E and $9^0 6'$ E. It is bordered by the Federal Capital Territory and Nasarawa State in the South, South East by Plateau and Bauchi State, North East by Kano State, in the North by Katsina State, North West by Zamfara State and South West by Niger State, (Kaduna State Statistical Year Book, 2001; Kaduna State Joined Local Government, Booklet, 2007). Samaru Zone of Kaduna state Agricultural Development Project (KADP) is located in the southern part of Kaduna State, spacing almost 200 Km away from the headquarters. It is made up of seven Local Government Areas: Kachia, Jaba, Kagoro, Jemaa, ZangonKataf, Kaura and Sanga Local Government Areas with a population of 1, 060,761 people (NPC, 2006).

The climate is predominantly tropical with two distinct seasons (dry and wet seasons). The rainy season starts from April to October with August and September as the wettest months having an annual average temperature of 23^0C-28^0C (KADP 2007). The Zone is predominantly agricultural with over 75 percent of the active population engaged in farming as their primary occupation (Shamah, 2009). The major cash crop is ginger where commercial quantities (1,728.930 Metric tons) are produced annually with Kachia, Jaba, Kagarko, Jemaa and Zangon Kataf Local Government Areas as the major areas of production (Kaduna State Perspective, 2009).

The target population for this study was all the women involved in ginger production in southern zone of Kaduna Agricultural Development Project (KADP). A multi stage sampling technique was used. The first stage involved a purposive selection of two Local Government Areas (LGAs) which include, Jaba and Kachia. The selection was due to high concentration and intensity in ginger production by women in these areas. The second stage involved a purposive selection of three villages from each of the LGAs. This gave a total of 6 villages (Nok, Kuryas,Fai, Jabankogo, Yarbung 1 and SabonSarki) villages. In the third stage, a list of ginger farming households from each village was used as sample frame, from which a sample of ginger farmers were proportionately drawn as shown in Table 1. Finally, 205 women ginger farmers were randomly selected for the study.

Table 1: Distribution of ginger farming households in sampled villages

LGAs	Villages	Sample frame	Proportionate Selection (%)	Random Selection
Kachia	Jabankogo	180	14	25
	Yarbung 1	210	16	34
	Sabonsarki	240	19	46
Jaba	Nok	200	16	32
	Kuryas	219	18	39
	Fai	190	15	29
Total	6	1239		205

Source: KADP (2017)

Primary data were used in this study. The primary data were obtained by the use of structured questionnaire administered to women ginger farmers. Data collected include socio-economic characteristics of the women ginger farmers which include; age, educational status, farming experience, marital status, household size, farm size, and access to credit, trainings and extension contacts and monthly expenditure.

Descriptive statistics was used to organize, summarize and analyze the data collected. Frequency distribution, mean, percentages was used to achieve objective I, poverty line estimate was used to achieve objective II, Probit regression model was used for objective III.

Foster, Greer, and Thorbecke (FGT) Model

The Foster, Greer, and Thorbecke weighted poverty index was used for the quantitative poverty assessment. The *P-alpha* measures, in analyzing poverty relate to different dimensions of the indices of poverty P0, P1, and P2 and were used for head count, depth, and severity of poverty. The three measures are all based on a single formula, but each index puts different weights on the degree to which a household or individual fall below the poverty line. This model was used to achieve part of objective (II) of this study. The model is specified as:

$$P_\alpha = \frac{1}{N}\sum_{i=1}^{q}\frac{(z-yi)^\alpha}{z} \quad (1)$$

Where;

p_α= FGT parameter, and takes on value 0, 1, 2

n = total number of households

q = the number of poor households whose expenditure are below poverty line

z = denotes the poverty line

yi= the per expenditure of the household

If $\alpha = 0$, it indicates the Headcount Ratio (Poverty incidence) describing the proportion of the population that falls below the poverty line.

If $\alpha = 1$ it gives the normalized poverty gap. This index gives a good measure of the extent or intensity of poverty as it reflects the distance the poor are from the poverty line.

When $\alpha = 2$ in FGT, it gives the Poverty Severity Index. This index has the advantage of reflecting the degree of inequality among the poor, in the sense that the greater the inequality of distribution among the poor, the higher is P2.

Foster *et al*. (1984) proposed a family of poverty indices based on a single formula capable of incorporating any degree of concern about poverty through the poverty aversion parameter α. This is the so-called P-alpha measure of poverty or the poverty gap index. The index is defined as:

$$P_\alpha = \frac{1}{N}\sum_{i=1}^{q}\frac{(zi)^\alpha}{z} \quad (2)$$

where z is the poverty line, q is the number of households below the poverty line, N is the total sample population, yi is the mean adult equivalent expenditure of the ith household, and α is the Foster *et al*. (1984) parameter, which takes the value 0 (which measures head-count ratio), 1 (which measures poverty depth) and 2 (which measures poverty severity), depending on the degree of concern about poverty. The quantity in parentheses is the proportionate shortfall of expenditure below the poverty line. By increasing the value α, the aversion to poverty as measured by the index is increased. For example, where there is no aversion to poverty $\alpha = 0$, the index is simply:

$$P0 = \frac{1}{N}q = q = H(3)$$

which is equal to the head count ratio. This index measures the incidence of poverty. If the

degree of aversion to poverty is increased, so that $\alpha = 1$, the index becomes:

$$P1 = \frac{1}{N}\sum_{i=1}^{z}(z-yi)^1 = HI \quad (4)$$

Here the head-count ratio is multiplied by the expenditure gap between the average poor person and the line. This index measures the depth of poverty; it is also referred to as "expenditure gap" or "poverty gap" measure.

Although superior to P0, P1 still implies uniform concern about the depth of poverty, in that it weights the various expenditure gaps of the poor equally. P2 or expenditure gap squared index allows for concern about the poorest of the poor by attaching greater weight to the poverty of the poorest than that of those just below the line. This is done by squaring the expenditure gap to capture the severity of poverty:

$$P2 = \frac{1}{N}\sum_{i=1}^{z}(z-yi)^2 \quad (5)$$

This index satisfies the Sen-Transfer axiom, which requires that when income is transferred from a poor to a poorer person, measured poverty decreases.

Poverty line: The poverty line defines the minimum level of income required for living. This study used per capita expenditure of the respondent. The poverty line that was used in this study is two-third of mean expenditure per adult equivalent. Household expenditure is considered as an adequate measure of household welfare in developing countries due to frequent fluctuation in exchange rate (*Bogale et al., 2005).*

Estimate of poverty status of respondents using the two-third mean per adult expenditure was calculated thus:

Per Capita Expenditure =

$$\frac{\text{Respondents total Expenditure per annum}}{\text{Household size}}$$

Mean Per Capita Respondents Expenditure (MPCRE) was calculated by;

$$\text{MPCRE} = \frac{\text{Total Expenditure for all respondents per annum}}{\text{Total number of household}}$$

From MPCRE, poverty lines was drawn to get two mutually exclusive classes, poor and non poor. (i.e. non poor were households whose per capita expenditure is equal or greater than two third of MPCRE, while poor we household whose per capita expenditure is less than two third of MPCRE) (Bogale *etal*., 2005).

Probit Regression Model

Probit regression model was use to achieve objective III.

The implicit form of the probit model is specified as follows:

Poverty Status =Y= Ln $(P_i/1-P_i) = (X_1, X_2, , X_4$ (1)

Y= Poverty Status (measured in dummy as non poor =1, poor = 0)

Ln= Natural logarithm function

Pi = Probability of non poor

$1-P_i$ = Probability of poor

X_1 ------ X_4 =Explanatory variable;

X_1 = Formal education (years)

X_2=Household size (No)

X_3 = Farming experience(years)

X_4= Farm Size (ha)

The explicit form of the probit regression is specified as follows:

Poverty Status= Ln $(P_i/1-P_i) = \varphi_0 + \varphi_1 EDU + \varphi_2 FEX + \varphi_3 HHSZ + \varphi_4 FS + \mu$….(2)

Variables used in equation (2) are defined as follows:

Poverty Status (dummy; 1 for yes and 0 for no)

Ln = Natural logarithm

Pi = Probability of non poor

$1-P_i$ = Probability of poor

δ = Constant

φ_1 ------ φ_6 = Regression coefficient

EDU = Formal educational (years)

FEX = Farming Experience (years)

HHSZ = Household size (No)

FS = Farm Size (ha)

μ= error term

RESULTS AND DISCUSSION

Socio-Economic Characteristics of the Women Ginger Farmers

The result of the study in Table 4.1 revealed that 44% of the women ginger farmers were within the age range of 31-40 and about 30% are within the age of 41-50 with a mean of 39 years, this shows that women ginger farmers in the study area were young farmers. The result also shows that about 24% of the women ginger farmers had no formal education while about 15% had only primary education, about 38% had secondary education and about 22% had tertiary education. About 42% had 11-20 years farming experience, 34% of the women ginger farmers had between 1-10 years of farming experience, 19% had about 31-40 years of farming experience and about 4% had 31-40 years of farming experience and the mean years of farming experience is 16 years. 65% had between 0.1- 1.0 hectares of farm land, about 27% had between 1.1- 2.0 of farm land while about 7% had between 2.1- 3.0 hectares. About 56% had household size that ranged from 6-10 persons, 42 % of the women ginger farmers had a household size ranging from 1-5 persons while about 2% had household size of 11-15 persons with a mean of 6.

Table 2: Socio-Economic Characteristics of the Women Ginger Farmers (n=205)

Variables	Frequency	Percentage
Age (years)		
21 — 30	31	15.1
31 — 40	92	44.9
41 — 50	62	30.2
51 — 60	19	9.3
>61	1	0.6
Mean	39	-
Education status		
No formal education	50	24.4
Primary education	31	15.1

Secondary education	78	38.1
Tertiary education	46	22.4
Mean	16	-
Household Size		
1 — 5	85	41.5
6 — 10	115	56.1
11 — 15	5	2.4
Mean	6	
Farming Experience		
1-10	70	34.2
11-20	87	42.4
21-30	39	19
31-40	9	4.4
Mean	14.87	-
Farm Size		
0.1-1.0	134	65.4
1.1-2.0	56	27.3
2.1-3.0	15	7.3
Mean	0.97	-

- Not applicable

Source: Field Survey (2017)

Poverty Status of Women Ginger Farmers

Poverty line in this study was determined as ₦57,776. Table 4.3 below shows that about 62% of the women ginger farmers were non poor while about 38% were poor. Poverty incidence, depth and severity were found to be 38%, 13% and 6%, respectively. In terms of depth of poverty, the

poor women ginger farmers will need 13% increase in their per capita expenditure to reach the poverty line of ₦57,776.

Table 3: Distribution of women ginger farmers according to poverty status

Classification of Poverty	Frequency	Percentage
Non-poor	128	(62.4%)
Poor	77	(37.6%)
Total	205	100.00
Constructed Poverty line is	N57766	
Poverty incidence,	Po = 0.37560976	(37.6%)
Poverty Gap (depth)	P1 = 0.137554	(13.7%)
Poverty Severity	P2 = 0.065423	(6.5%)

Source: Field Survey (2017)

Effect of Socio-Economic Factors on Women Ginger Farmers Poverty Status

The model goodness of fit measured by the likelihood ratio (LR) statistics (89.573) was significant at 1% level of probability. Table 3 showed that coefficients of educational status and farm size, and farming experience were significant at 1% and 5% probability levels respectively.

The coefficient of years of education statistically significant at 1% level. This result implies that women ginger farmers with relatively better education are more likely to be non poor than those without formal education. Education stimulates entrepreneurial and management skills (Bala, 2016). The result of this study agrees with the findings of Adeyemi *et al.,* (2002) who pointed that education status of farming household have tendency to adopt improved farming techniques better and faster than those with no formal education. This will however raise the productivity and income of the educated households with subsequent improvement of welfare amongst them thereby reducing their poverty level.

The probit regression further shows that, the coefficient of farm size is significant at 1%. This indicate that women ginger farmers with larger farm sizes have higher probability of been non poor farmers than those with smaller farm sizes, that is as farm sizes increases, the probability of being poor decreases. Reddy (2004) pointed out that greater efficiencies in the use of resources are associated with the large farms than small farms. This study is in line with study by Sridhar (2007) who assessed the impacts in terms of changes in farm size and recorded a significant and positive impact on farm income due to increase in farm sizes and consequently reducing rural poverty. Farmers with smaller farm sizes have tendency of low productivity and low income and consequently incidence of being poor.

The coefficient of farming experience was significant at 5%. This shows that the more the farming experience of women ginger farmers, the more the probability of being non poor. Farming experience determine the ability to make effective farming management decision, effective input combination and production efficiencies due to accumulation of skills over the years and can lead to highest possible output that can in turn increase income and better living standard. Adetula *et al.,*(2006) noted that, the longer a person stays on a particular job, the better his efficiency level tends to be and the more the revenue he/she generate with minimum cost.

Table 4: Probit regression showing effect of socio- economic factors on women ginger farmers

Variables	Coefficient	S.E	Z
Constant	-1.965	0.471	-4.170***
Education	0.138	0.022	6.256***
Household size	-0.084	0.053	-1.585NS
Farming experience	0.034	0.014	2.414**
Farm size	1.062	0.017	6.090***
LR statistics	89.574*		

Source: Field Survey (2017)

Note: *** denotes significant at 1% level
** denotes significant at 5% level
NS Not significant

Conclusion and Recommendations

From the findings of this study, it was concluded that majority of the women ginger farmers were non-poor farmers. Educational level, farm size and farming experience influenced the poverty status of women ginger farmers. Poverty status decreases with increase in education level.

It recommended that women ginger farmers should be given the best needed educational assistance and innovation in ginger production and also since increase in farm sizes decreases poverty status, farmers should be given needed input required to increase their farm sizes.

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