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TABLE OF CONTENT

UTILISATION OF FADAMA III ADDITIONAL FINANCING TECHNOLOGIES AMONG RICE FARMERS IN NIGER STATE NIGERIA

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ABSTRACT
The study assessed the utilisation of Fadama III AF technologies and the factors influencing utilisation of Fadama III AF among rice farmers. Primary data were used for this study and these were collected with the aid of structured interview schedule. Multi-stage sampling procedure was used to select 160 respondents randomly. Descriptive and inferential statistics such as multiple regression (OLS) were used to analysed the data. The age of the farmers revealed that 33% were between 40 – 49 years with mean age of 41 years. The majority (82%) were males, while 34% had secondary education. A total of 30% of the farmers had between 6 – 10 members of household. The result showed 21% had between 16 – 25 years of farming experience. All the farmers were active participants of Fadama III-AF programme and had contact with Fadama facilitators during the 2017/2018 cropping year. The study also revealed that 89% had access to credit and the average income from rice farming was ₦328,081.50. About 75% of the farmers had 3 – 4 information sources relating to the programme. The result implies that majority of the respondents had utilised Fadama III-AF technologies available in the study area. The regression analysis (OLS) shows that sex, education, farming experience, information source, contact with Fadama facilitators were significant at 1% or 0.01, farm size, social organisation and age significant at 5% or 0.05 and access to credit indicated positive and significant at 10% or 0.1 with utilisation of Fadama III AF rice technologies. It can be concluded that there was high rate of utilisation of Fadama III-AF technologies among rice farmers in the study area. The study recommended that farmers should be given more assistance to obtain credit facilities through financial institutions.
Keywords: Utilisation, Fadama III AF technologies, rice farmers.

INTRODUCTION

Nigeria is a key regional player in West Africa, with population of approximately 184 million, Nigeria accounts for 47 percent of West Africa's population, and has one of the largest population of youth in the world (World Bank, 2017). Agricultural sector, since the discovery of oil has witnessed lots of neglect from the various successive governments. At present, the sector accounts for 35 percent if not below of the real sector, while crude oil accounts for about 55 percent and above (Noko, 2017). While the sector is accounting for one-third of the GDP, it remains the leading employment sector of the vast majority of the Nigerian population as it employs two-third of the labour force (Noko, 2017). The Federal Government of Nigeria through the pooled World Bank loan came up with the National *Fadama* Development Project, to finance the development of *Fadama* lands which has a lot of agricultural potential than the associated upland soils. *Fadama* is a low lying land subject to seasonal flooding or water logging along the banks of streams or depressions. The term *Fadama* is a Hausa word meaning; floodable plains along major bank of rivers and streams. *Fadama* project is mainly aimed at sustaining increase in the income of users of rural land and water resources (IDA, 2010).

The objective of the Additional Financing (AF) for the Third National *Fadama* Development Project for Nigeria was to increase the income for users of rural lands and water resources within the *Fadama* areas in a sustainable manner throughout the recipient's territory. The additional financing focuses on improving farm productivity performance of clusters of farmers engaged in priority food staples namely rice, cassava, sorghum and horticulture in six selected states with high potential. According to Idrisa (2009), utilisation of improved technologies is an important factor to increase the productivity of small holder farmers in Africa, thereby fostering economic growth and improved well-being for millions of the poor households.

Fadama III AF project has been disseminating technologically improved production techniques/inputs to rice farmers in Niger state since 2015, however little or no effort has been made to investigate the utilisation rate of the various rice technologies by farmers. The research was therefore designed to describe the socioeconomic characteristics of the Fadama III AF rice farmers, examine *Fadama* III-AF rice technologies utilised by the farmers in the study area; and determine the factors influencing utilisation of *Fadama* III AF rice technologies by the farmers.

METHODOLOGY

The study was conducted in Niger State of Nigeria which lies between Latitude 8° and 11°20'N and Longitudes 4°30' and 7°40'E. The State is bounded by Kaduna State and FCT to north-east and south-east respectively; Zamfara State, Kebbi State, Kogi State, Kwara State, and the Republic of Benin. It has a land area of 76,363 km2 (Niger

State website, 2018). The population of Niger state was 3,950,429 (NPC, 2006). However, the Bureau of Statistics had maintained an approximated population growth rate of 2.5% geometrically for the country, based on which the projected population as at 2017 was estimated to be 5,135,558 (National Bureau of Statistics Estimates, 2018).

Multi-stage sampling was used in the study. The sample covered all the three agricultural zones in the state, namely: Bida, Kuta and Kontagora. According to the Niger state Fadama coordination office (2017), there are fifteen (15) Local Government areas that are into rice farming, with about 5,212 rice farmers supported (Implementation Status Report on Fadama AF Niger State, 2017).

One Local Government Area (LGA) each among the agricultural zones was randomly selected giving a total of three LGAs (i.e. Lavun LGA from Zone I, Gurara LGA from Zone II and Wushishi LGA from Zone III). In the second stage, three Fadama rice producing clusters were selected from each of the LGA, with exception of Gurara LGA that has only two rice producing clusters during the last cropping season, thereby making a total of eight (8) *Fadama* rice clusters for the study. In stage three, four production groups were selected from each cluster, giving a total of thirty-two (32) production groups. However, list of rice farmers in the selected communities was obtained from Niger State *Fadama* Office, this form the sample frame for the study. In the fourth and final stage, five (5) rice farmers which make up 50% of each group were proportionately selected from each of the thirty-two production groups, giving a sample size of 160 respondents.

Both descriptive and inferential statistics were used to analyse the data collected in this study. Ordinary Least Square (OLS) regression model was used in analysing the factors that influence utilisation of *Fadama* III-AF rice technologies, while descriptive statistics such as mean, frequency and percentages were used to analyse the socioeconomic characteristics of the respondents.

Measurement of variables

The variables measured are divided into two parts as shown: Dependent and Independent Variables.

Independent variables

Age: The age of the *Fadama* rice Farmers were measured in years as given by the respondents.

Sex: This explain the general sex of the respondents, which is either male or female. This was measured, male is equal one (1) and female is zero (0).

Education: This was measured as numbers of years spent in the formal educational system by the Fadama rice Farmers.

Farm Size: The Fadama Rice Farmers farm size was measured in hectares of land cultivated during the cropping season as given by the respondents.

Farmers Experience: This was measured by the total number of years in rice farming.

Household Size: This is defined as the total number of people living in a given household as at a particular point in time. Household size was measured by the total number of people the Fadama rice Farmers is feeding and taking care of. These include the husband or wife, children and any other dependent.

Contact with Facilitators: This was measured by the number of contacts the respondents have with their facilitators per month; either for demonstrations or information.

Income: Income, in this context, refers to the amount farmer obtained per annum. This was determined by the amount generated/received from the sales of their farm produce.

Access to Credit: This is the access to formal sources of credit by farmers for the purpose of farming. This was determined by knowing how much of the credit gets to the farmers and this will be measured in Naira amount.

Information Sources: This is measured by the number of information sources indicated by the farmers.

Membership of Association: This answered the question in years. That is the number of years the rice farmers have being in the group.

Dependent variables

The dependent variable of the model was utilisation of the *Fadama* III-AF technologies by rice farmers. The variables are operationalized as; (1) rice varietal trial, (2) plant per hole 2-3 seed, (3) transplanting one seedling per hole, (4) water management, (5) spacing 20cm/20cm, (6) fertiliser application NPK 4bags/Urea 2bags, (7) pre-emergence 2liter/post-emergence 2liters, (8) faro 44variety, (9) deep of hole 3-4cm, (10) bird scaring techniques, (11) urea deep placement, (12) threshing, (13) winnowing and (14) farm machines were considered. The dependent variable (Y) takes values between 1-14 based on the utilisation of *Fadama* III-AF technologies by the respondents. Respondents that utilised 1 technology have their Y value equal to 1, those who utilised 2 have their value to be 2, and this continues to the maximum of 14 to the respondent that utilised all the 14 technologies.

Ordinary least square (OLS) regression model

OLS model was employed to achieve the third objective of the study i.e. factors influencing utilisation of *Fadama* III-AF by rice farmers as used by Bawa and Ani (2015). The regression model is specified in its implicit form as follows:

$Y = f(\beta X_i.U) \ldots\ldots (1)$

Explicitly, the functional form of the model is expressed as:

$$Y = \beta o + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \ldots\ldots\ldots + \beta_{11} X_{11} + e \ (2)$$

Where;

Y = Rice technologies utilised by the farmers, takes value between 1-14

$i = 1, 2, 3\ldots\ldots\ldots\ldots\ldots\ldots\ldots$, n number of independent variables.

X_1 = Age (Years)
X_2 = Sex (Male=1, Female=0)
X_3 = Level of education (Years spent in school)
X_4 = Farm size (ha)
X_5 = Farmers experience (Number of years)
X_6 = Household size (Number of people per household)
X_7 = Income (₦) (Amount farmers obtained per annum)
X_8 = Contact with facilitators (number of contacts with facilitators)
X_9 = Access to credit (In Naira)
X_{10} = Information sources (Number of sources)
X_{11} = Membership of social organisations (Number of years)
$X_1 – X_{11}$ = set of explanatory variables
βo = Constant
$\beta_1 – \beta_{11}$ = Coefficients of the explanatory variables
e = error term

RESULTS AND DISCUSSION
Socioeconomic characteristics

Table 1 revealed that the majority (82.50%) of the farmers were males, while only 17.50% represent the female. This result implies that males dominated rice farming in the study area. However, Olaolu *et al*. (2013) asserted that the sex distribution of the respondents among *Fadama* rice farmers is skewed towards males in the *Fadama* development project. Also, studies by Idris *et al*. (2007) revealed that sex plays significant role in accessing production resources and hence utilisation of agricultural innovations.

On the level of education of the farmers, Table 1 shows that those who had secondary education dominated the distribution with a proportion of 34.38%. This result is in line with Folorunso (2015) who posited that there is a positive relationship between education and productivity in rice production.

The result in Table 1 reveals that the mean age of the Fadama rice farmers in the study area is 41 years. This age represents the active groups who are in their active period of life and are more likely to adopt and utilise new technologies readily and easily than the older age brackets. This result is in agreement with the findings of Nlerum, (2013) who

opined that active age group of between 20 to 40 years dominates the society that contributes immensely to the productive sectors such as agriculture.

More so, the results in Table 1 revealed that about 21.88% had farming experience between 16 – 20years. The average farming experience was 16years. Ogunmefun and Achike (2015) indicated that farmer's experience in farming reveals the rate of his exposure to risk, and also the use of risk management strategy. Also results of household size show that 30.63% of the farmers had household size of 6 – 10 members. The mean household size of 10 people was recorded in the study. This implies that family labour is an important component of factor of production for small-scale farmers. This agrees with Ibok *et al*. (2015) that the main source of labour for subsistence farmers is man power, hence justifying the reason for large family size.

Furthermore, Table 1 revealed that all the farmers had 1 hectare of land. This is as a result of Fadama III AF intervention that allocated only 1 hectare of land to farmers in other to actualize maximum output. Small land holding is a typical situation which characterised the third world countries (World Bank, 2008). The majority (88.75%) of the rice farmers in the study area had access to credit. The study further revealed that the source of the credit was mainly from family and friends and not financial organisations.

According to an earlier study by Danjuma *et al*. (2016) farmers have the potentials to improve their productivity but they lack the capital necessary to finance their farming activities.

The study also revealed that 75.63% of the Fadama III AF rice farmers had between 3 – 4 sources of information. This implies that the more information sources available to farmers, the greater their chances of utilisation of technologies at their disposal. According an earlier studies Daudu *et al*. (2009), revealed that most farmers depend on extension agents and friends for agricultural information, which could be as a result of the ability of these farmers to have face-to-face contact with these sources. More than half (58.75%) of the respondents have spent between 6 – 10 years in which they belonged to social organisations as shown in Table 1 implying that all the Fadama III AF rice farmers interviewed were 100% active members of the project. According to Gasana (2011), farmers join social organisations for external support, cooperatives performance, market access and collective bargaining, access to input service and credits, wealth creation and risk sharing.

Table 1: Distribution of respondents based on their socioeeconomic characteristics (n=160)

Variable	Frequency	Percentage	Mean
Sex			
Male	132	82.50	
Female	28	17.50	
Education	18	11.25	
Primary	43	26.88	
Secondary	55	34.38	
Tertiary	44	27.50	
Age			
20-29	15	9.38	41
30-39	53	33.73	
40-49	54	33.75	
50-59	34	21.25	
60-69	1	0.63	
70-79	3	1.88	
Farming experience			
1-5	11	6.88	16
6-10	20	12.50	
11-15	33	20.63	
16-20	35	21.88	
21-25	24	15.00	
26-30	21	13.13	
31-35	11	6.88	
36-40	5	3.13	
Household (Number)			
1-5	28	17.50	10
6-10	49	30.63	
11-15	41	25.63	
16-20	24	15.00	
21-25	15	9.38	
26-30	3	1.88	
Access to credit			
Yes	142	88.75	0.89
No	18	11.25	
Information source			
1-2	11	6.88	3.21
3-4	121	75.63	
5-6	28	17.50	
Membership of organisation (years)			
1-5	58	36.25	6.73
6-10	94	58.75	
11-15	6	3.75	
16-20	2	1.25	
Income (₦)			
1- 500,000	139	86.88	328,081.50
500,001- 1,000,000	19	11.88	
1,000,001- 1,500,000	2	1.25	
Contact with Fadama facilitators			
12	20	12.50	22.50
24	140	87.50	

Source: Field Survey, 2018

In addition, the study also showed that 12.50% of the Fadama rice farmers received 12 visits from Fadama facilitators, while 87.50% received 24 visits. The visits were based on the Fadama facilitator's contact per annum. Result from the study shows that 86.88% of the rice farmers had an annual income between ₦1 – ₦500,000, 11.88% had more than ₦600,000, while 1.25% realized between ₦1,000,001 - ₦1,500,000. The mean annual farm income was found to be ₦328,081.50. Study by Danjuma *et al*. (2016) revealed that *fadama* project has a significant

positive impact on farmers' annual income as well as annual output.

***Fadama* III-AF Rice technologies utilised by the respondents**

The result in Table 2 showed the *Fadama* III-AF rice technologies utilised by the respondents in the study area. The result revealed that 100% of the respondents indicated to have utilised the following rice technologies in the study area: plant per hole 2-3 seeds, water management technique, spacing 20cm/20cm, fertiliser application NPK 4 bags/ urea 2 bags, pre-emergence 2litre/pre-emergence 2 litre, faro 44 variety and winnowing respectively.

Similarly, other technologies the respondents utilised are in this order: rice varietal trial (98.75%), farm machinery (75.0%), depth of hole 3-4cm (98.13%), bird scaring technique (5.0%), urea deep placement (85.0%), and threshing (98.75%). The result implies that majority of the respondents had utilised *Fadama* III-AF technologies available in the study area. This result agrees with the study of Idrisa (2009) who reported that utilisation of improved technologies is an important factor to increase the productivity of small holder farmers in Africa, thereby fostering economic growth and improved well-being for millions of the poor households.

Table 2: Distribution of respondents based on *Fadama* III-AF rice technologies Utilised

Rice Technologies	Frequency*	Percentage %
Rice varietal trial	158	98.75
Plant per hole 2-3 seed	160	100
Transplanting one seedling per hole	160	100
Water management	160	100
Spacing 20cm/20cm	160	100
Fertiliser application NPK 4bags/ Urea 2bags	160	100
Pre-Emergence 2liter Post- Emergence 2liters	160	100
Faro 44 variety	160	100
Machinery	120	75
Deep of hole 3-4cm	157	98.13
Bird Scaring	8	5.00
Urea deep placement	136	85.00
Threshing	158	98.75
Winnowing	160	100

Source: Field Survey, 2018
* Multiple responses

Factors influencing utilisation of Fadama III AF Rice technologies by rice farmers

The OLS result in Table 3 revealed that variables such as sex, age, education, farming experience, social organisation, Fadama facilitator, farm size, access to credit and information sources all indicated positive and significantly influence utilisation of Fadama III AF rice technologies among rice farmers in the study area. The coefficient of sex was significant at 1% and relates positively with utilisation of Fadama III AF rice technologies. The positive and significant relationship between gender of the farmers and the utilisation of Fadama III AF rice technologies implies that gender plays significant role in utilisation of agricultural technologies. Age of the farmers was significant at 5% level and relates negatively with utilisation of Fadama III AF rice technologies. This implies that an increase in the age of the farmers will translates to a reduction in rate of farmers' utilisation of technologies. This confirms to the study of Ibok *et al.* (2015) that young farmers are keen to adopt new knowledge and information faster than older farmers. It may

also be that older farmers are more risk averse and less likely to be flexible than young farmers and thus have a lesser likelihood of information utilisation and new technologies.

Table 3 further revealed that there is a positive and significant (1%) relationship between the level of education and utilisation of Fadama III AF rice technologies. This result agrees with studies by (Bawa and Ani, 2015; Oyewole and Ojeleye, 2015) that revealed a positive significant relationship between farmers' level of education and utilisation of maize improved innovations. The coefficient of farmers' experience was significant (1%) and relates positively with utilisation of Fadama III AF rice technologies. This implies that farmers in the study are area highly experience in rice production. Also year of membership of social organisation was significant (5%) and positively relates with the rate of utilisation of Fadama III AF technologies. The implication is that as the years of membership of organisation increases, the rate of utilisation of Fadama III AF rice technologies increases by 0.1065.

Contact with Fadama facilitator was significant at 1% level of probability, with coefficient of 0.0810. This implies that as contact with Fadama facilitator increase, will translate in a corresponding increase in the rate of utilisation of Fadama III AF rice technologies, a unit increase in contact with Fadama facilitator, will increase utilisation by 0.0810. This means that as the rice farmers have more contact with Fadama facilitator, they will have increase access to latest farm practice, farm inputs and market information and these will lead to increase in farm output from the same size of land. Farm size was statistically significant at 5% level of probability. Farm size had a coefficient of 0.1161 at 5% level of significant. This means as farm size increase,

utilisation of Fadama III AF rice technologies increases; a unit increment in farm size, will increase utilisation rate by 0.1161. Access to credit was significant at 10% level of probability with a regression coefficient of 0.3165. The implication is that the more farmers have access to credit, the greater the rate their utilisation of Fadama III AF rice technologies and a unit increment in access to credit will correspond to a unit increase in utilisation of Fadama III AF rice technologies by 0.3165. This agrees with the earlier study of Danjuma *et al*. (2016) that sufficient capital and credit aid farmers to purchase inputs as well as to procure farm machines to ease their farming activities.

Table 3: Regression estimate of factors influencing utilisation of *Fadama* III AF rice technologies by rice farmers

Variables	Estimated Coeff.	Standard Error	t-value	P-value
Constant	8.570397	0.5251743	16.32	0.000***
Sex	0.4655575	0.1503256	3.10	0.002***
Age	-0.0336822	0.0131031	-2.57	0.011**
Education	0.1899787	0.0218478	8.70	0.000***
Experience	0.1064868	0.0124514	8.55	0.000***
Household	0.0508341	0.0357813	-1.42	0.158[NS]
Social organisation	0.1333786	0.0542485	2.46	0.015**
Fadama Facilitator	0.0809638	0.0127845	6.33	0.000***
Farm size	0.1161071	0.0558127	2.08	0.039**
Access to Credit	0.3164653	0.1804455	1.75	0.082*
Income	2.69e-07	3.55e-07	0.76	0.451[NS]
Information source	0.2682218	0.0510152	5.26	0.000***
R^2	0.85			
R^{-2}	0.84			
F	81.27***			

Source: Field Survey, 2018
Note: * Significant at 1%, ** Significant at 5%, * Significant at 10%, NS Not Significant**

Finally, the information source shows positive and significant at 1% level of probability. Information source had a coefficient of 0.2682. This implies that the more information sources the farmers have concerning Fadama III AF rice technologies, the more the farmers utilises technology and a unit increment in information sources available to farmers will increase the rate of their technology utilisation by 0.2682. According to earlier studies Daudu *et al*. (2009), revealed that most farmers depend on extension agents and friends for agricultural information, which could be as a result of the ability of these farmers to have face-to-face contact with these sources.

CONCLUSION AND RECOMMENDATION

Utilisation of technology could assist farmers increase their production levels and income considerably. The capacity to educate their children would be enhanced and their standard of living

improved. Government should therefore assist farmers to access the more efficient factors which influence technology utilisation. In areas where illiteracy level is high, the employment of extension agents and the use of radio would facilitate technology utilisation. Research institutions and organisations related to agriculture such as Fadama Development project and ADPs should intensify their research efforts in breaking new grounds for innovations to be disseminated by extension agents.

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EFFECTIVENESS OF INDIGENOUS TECHNOLOGIES FOR THE TREATMENT OF HELMINTHS IN CATTLE AMONG SETTLED AGRO-PASTORALIST IN SOUTH WEST NIGERIA

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ABSTRACT

Irrespective of the production systems employed, one of the major constraints to ruminants' production in Nigeria and elsewhere is gastro intestinal parasitism. The study examined the indigenous technologies for the treatment of helminths in cattle among settled agro-pastoralist in southwest Nigeria. Two hundred agro-pastoralists were selected using convenient sampling techniques, but 169 respondents were eventually interviewed and this account to the number of returned questionaire. Data collected on personal characteristics; indigenous technologies used by agro-pastoralist, preferred indigenous technology and effectiveness of indigenous technologies for the treatment of helminthes in cattle were subjected to both descriptive (such as frequency count, percentage, and mean) and inferential (ANOVA) statistical analyses. The findings showed that respondents' mean age was 47, years, mean household size was 12 persons and 43.8% had only Quranic education while 90.5% of them were married. The most commonly used, and preferred indigenous plant for the treatment of helminthes were *Ewuro* ($\bar{x} = 3.69$), *Efirin* ($\bar{x} = 3.29$), *Ata wewe* ($\bar{x} = 3.24$), *Alubosa* ($\bar{x} = 3.17$), *Ewe ibepe* ($\bar{x} = 3.16$) and *Iyere* ($\bar{x} = 3.10$). Conventional drug caused a significant decline between Day1 ($\bar{x} = 4300.00$ SD±788.811) to Day 3 ($\bar{x} = 0.00$ SD±0.00). The herbal drug significantly cleared the worm loads between Day1 ($\bar{x} = 4500.00$ SD±623.61) to Day 4 ($\bar{x} = 0.00$ SD ±0.00) while there are no significant changes in the control group. The study concludes that agro-pastoralist communities were young with large household member, rich in traditional knowledge on medicinal plants used to treat their herds. It is therefore recommended that preservation of all the identified indigenous technologies used by the Agro-pastoralist should be avoided to go extinction and educate them on the proper usage of anti-helminthes drugs and administration.

Keywords: Effectiveness, Indigenous, Disease, Helminthes, Agro-pastoralist, Cattle

INTRODUCTION

Helminthosis is a disease condition caused by internal parasitic worms that invade the internal organs of livestock while Helminths are endo-parasites comprising of a large and varying group of invasive parasites. According to Lawal-Adebowale (2012) who noted that all the livestock that makes up the farm animals (ruminants) in Nigeria, comprising sheep, goats and cattle, constitute the farm animals largely reared by farm families in the country's agricultural system. Nigeria has population of 34.5million goats, 22.1million sheep and 13.9million cattle. Prevalent helminthes in Africa are Nematode; *Haemonchus, Cooperia, Bunostomum, Trichuris, Oesophagostomum, Trichuris* and *Strongyloidiasis.* *Cestodes* include; *Monezia* while Trematodes consists of; *Paramphistomum, Fasciola, Dicrocoelium* which are usually more pronounced in the intestine of ruminant animals. Gastro-intestinal nematode infections are a major part of the health problem affecting cattle. Several workers have reported economic losses in cattle production due to these infections in the aspects of reduction in meat quantity and quality, milk production, organ condemnation (liver), loss of draught power, reproductive failure, mortality as well as risk of contracting zoonotic species (Hossain, Paul,

Rahman, Hossain, Hossain and Islam 2011; Odigie and Odigie, 2013). One approach common among indigenous group for the control of helminths over diseases is the use of indigenous technology. The terms indigenous, traditional and/or local knowledge make reference to knowledge and know-how that is accumulated over generations and guides human societies in their innumerable interactions with their surrounding environment. Berkes (2012) defines such traditional, ecological knowledge as "a cumulative body of knowledge, practice and belief, evolving by adaptation processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with their environment". Agro-pastoralists would rather draw on years of knowledge and experience of indigenous technology practices conserved in oral histories and traditions among different groups. Cattle are parasitized by various helminths species, the most important being Gastro-Intestinal Nematodes (GIN), lungworms and liver fluke (Charlier, De-Waele, Ducheyne, van der Voort, Velde, and Claerebout, 2016). These pathogens can cause severe disease, affect productivity in all classes of stock, and are amongst the most important production-limiting diseases of grazing ruminants. Essentially all herds/flocks in a grass-

based production system are affected (Charlier, *et al.,* 2016). Infections with GIN and liver fluke are more chronic and the major economic impact is due to sub-clinical infections causing reduced growth, milk yield and fertility (Morgan, Charlier, Hendrickx, Biggeri, Catalan, von Samson-Himmelstjerna, Demeler, *et al.,* 2013). Infections with lungworm are more acute and can place a sudden high economic burden on a farm due to mortalities and sharp decreases in milk yield (Holzhauer, van-Schaik, Saatkamp and Ploeger, 2011).

These indigenous veterinary practices have been in operation in bits and pieces from generation to generation, but have to become the driver for bottom-up development in cattle production for the sake of sustainability. Sustaining the aroused interest of agro-pastoralists in the use of indigenous technologies therefore becomes imperative. Instead of demonstrating presence/absence of infection in a cow or herd, it is more relevant to identify the associated production losses to convince farmers that further diagnoses, and control measures, are worth considering (Charlier, Vercruysse, Morgan, van-Dijk and Williams, 2014). It is therefore critical to create an enabling environment, for seamless fusion of indigenous and scientific knowledge by first documenting and utilising complimentary experiences of agro-pastoralists towards sustainable cattle health management. The study objectives are to: identify the indigenous technologies for the treatment of helminths in cattle by settled agro-pastoralists; methods of administration of identified indigenous technologies for the treatment of helminths in

cattle; preferred indigenous technologies used for the treatment of helminths and the effectiveness of indigenous technologies for the treatment of cattle helminths compared to conventional methods of treating helminths among agro-pastoralist in the study area.

METHODOLOGY

The study was conducted in the South West region of Nigeria. The region is one of the six geo-political zones in Nigeria. It comprises six states which are Lagos, Ogun, Ondo, Osun, Oyo and Ekiti States (Figure 1). This region is more preferable by the Fulanis because of the longer rainy season as compared to the shorter rainy season of their traditional home in Northern Nigeria. The region lies between latitude $7^0 01'$ and $8^0 14'$ and stretches between longitude $2^0 45'$ and $4^0 15'$. The area is inhabited mainly by the Yoruba's who are traditionally sedentary agriculturists and traders. Ogun State is a heterogeneous state, inhabited predominantly by the Egba, Yewa, Ijebu, Remo, Awori, and Egun who belong to the Yoruba Ethnic group on the African Continent. Ogun State is located on the latitude $7^0 18^1 N$ and longitude $5^0 55^1 E$. Ogun State has green vegetation which favours many settled Fulani pastoralists. Oyo State was one of the three States carved out of the former Western Region of Nigeria in 1976. The climate in Oyo state favours the cultivation of forage crops and pasture. The State has an equatorial climate with dry and wet seasons and relatively high humidity. The population of this study were all settled agro-pastoralist household heads in South West Nigeria.
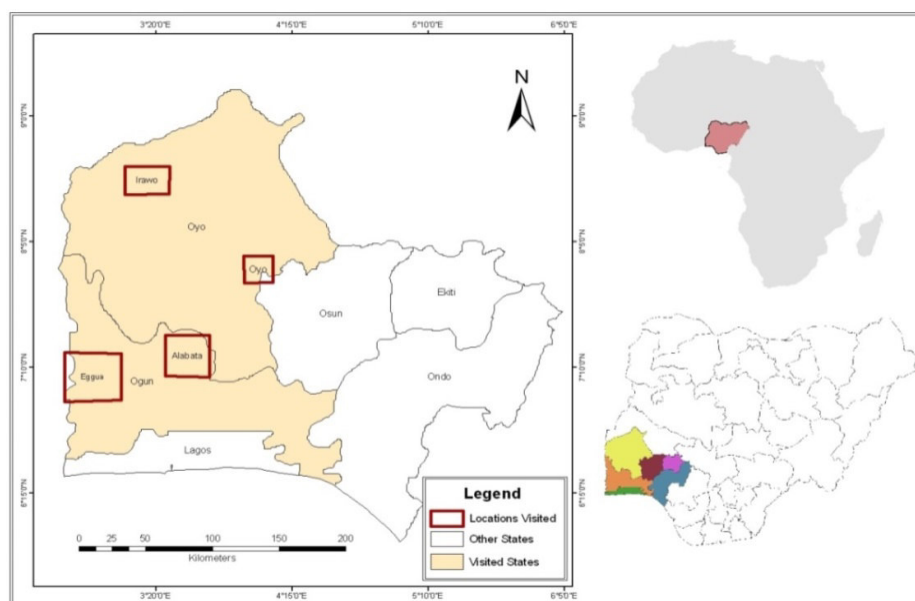
Figure 1: Map of the South Western region of Nigeria showing the study areas.

Sampling procedure and sample size: The respondents were selected through a multi-stage sampling technique. Stage One: involved a purposive selection of two states (Ogun and Oyo States) out of the six states in South West Nigeria. The selection was based on high population of settled agro-pastoralists. Stage Two: From Ogun and Oyo states, two Local Government Areas (LGAs) were purposively selected which were Odeda and Yewa North LGAs from Ogun State and Atisbo and Oyo East from Oyo State. This is based on geographical or vegetation location and presence of settled agro-pastoralists. Stage Three: From each of the Local Government Areas selected, one community with large presence of agro-pastoralists was selected purposively. The communities are Alabata and Eggua in Odeda and Yewa-North, Ogun State respectively; Ido ide and Irawo in Oyo East and Atisbo, Oyo State respectively. Fifty (50) pastoralists household were conveniently selected in each LGA. The respondents were also selected on the basis of willingness of the settled agro-pastoralists to cooperate with the research team. A total of 200 respondents were selected for the study, but 169 respondents were eventually interviewed and this account to the number of returned questionaire

Measurement of variables

Available Indigenous plants used: Compendiums of the various indigenous plants used by agro-pastoralists were generated and with support from literatures (Nanule, Mbaria, Olila and Kimenju, (2011). It was measured at the ordinal level of 3 = most commonly used, 2 = less commonly used and 1 = Seldomly used,

Various methods of administration of identified indigenous plants: This was measured by providing a list of the identified indigenous plants used by settled agro-pastoralist to treat helminths and method of administration was measured at nominal level of 1 = Oral method, 2 = Drenching 3 = Skin massage and 4= Inclusion in feed.

Dependent variable: The dependent variable in this study is the percentage change in the fecal egg count (FEC) of the infected animals as shown in Table 1. A percentage in efficacy of compendium of indigenous plants used for treatment of helminths was generated on the basis of reduction in mean egg per gram (EPG) in percent. using the following formula as described by Sutherland and Leathwick, 2011).. This is to measure the efficacy of the plant extract use for treatment of helminths infection.

Mathematically:

$FECR(\%) = ((FEC_{bt} - FEC_{at})) / FEC_{bt} \times 100$

Where: FECR (%) denotes percentage of faecal egg count reduction.

FEC_{bt} and $FEC_{at\ represents}$ the mean egg count before and after treatment respectively.

Therefore, the value of FECR (%) ranges between 1000 and 3000egg/gram while the Effectiveness index was on the basis of reduction in faecal egg count, the result was Categorised as follows:

Table 1: Fecal Egg Count (FEC)

Faecal count	Tolerable level of infection
≤ 1000	Low grade infection
2000- 3000	Moderate
> 3000	Severe infection

Methods of data analysis

In order to achieve the objectives of this study and test the research hypotheses, the data collected were subjected to both descriptive and inferential statistical analyses. Descriptive statistics such as percentages, mean and frequency distribution were used to describe the data collected in tables, charts and graphs. Inferential statistics such as Analysis of variance (ANOVA) were also used to test the hypotheses. For hypotheses testing, 0.05level of significance was used.

RESULT AND DISCUSSION

Results in Table 2 shows that mean age of the settled agro-pastoralists was 47±10.95 years. This is an indication or reflection of an increasing population towards old age. In a study conducted by Saleh, Atala, Omokore, Ahmed, Aliand and Kajang (2016) they reported that 63% of their respondents were above 35years of age in a study they conducted in Northern Nigeria. It was observed that the respondents have an average household size of 12 persons. This implies that a typical pastoral family is large and this large number of household members supplies the bulk of labour required for farm activities. This negate the finding of Timothy (2012) which noyed that the African rural average house hold size is 10. This may be because most of the household members marry very early and become independent. Result further reveals that most (90.5%) of the agro-pastoralists were married which shows that marriage is a treasury institution and still plays a very important role in the way of life of pastoralists. Responses gathered on educational status reveal that 35.5% of the pastoralists had no form of education while (43.8%) had only Quranic education. They were literate in Quranic education

indicating that on the basis of western education they were literate enough to understand and communicate better in the society. Some of the pastoralists disclosed that they have interest in formal education but they lacked the opportunity in the study area.

Table 2: Personal characteristics of the agro-pastoralist (n = 169)

Variables	Frequency	Percentage	Mean /Std. dev
Age (yrs)			
18-27 years	15	8.9	
28-37 years	35	20.7	
38-47 years	45	26.6	47.5/10.95
48 -57 years	61	36.1	
57 years and above	13	7.7	
Household size			
1-5	8	4.7	
6-10	15	8.8	
11-15	76	45.0	12.7/11.21
16-20	30	17.8	
21-25	22	13.0	
26 and above	18	10.7	
Educational status			
No formal education	60	35.5	
Quranic education	74	43.8	
Primary education	26	15.4	
Secondary education	6	3.6	
Adult education	3	1.8	
Marital status			
Single	11	6.5	
Married	153	90.5	
Divorced	2	1.2	
Separated	1	.6	
Widowed	2	1.2	

Source: Field Survey, 2016.

Indigenous technologies used by agro-pastoralist

Result in Table 3 shows that the most commonly used plant in the treatment of helminthes were *Ewuro, Efirin, Iyere*, *Ata wewe*, *Alubosa* and *Ewe Ibepe* with the mean value of ($\bar{x}$ = 3.69), ($\bar{x}$ = 3.29), ($\bar{x}$ =3.26), ($\bar{x}$ = 3.24), ($\bar{x}$ = 3.17) and ($\bar{x}$ = 3.16) respectively. The significance of helminthiasis has been recognized by livestock farmers right from the earliest of times and various methods have been employed by them to control helminthes in their animals including the use of medicinal plants and herbs and different grazing techniques (Bukhari and Sanyal, 2011). Scientific validation of anthelmintic effects and possible side-effects of plant products in ruminants is necessary prior to their adoption as a novel method for parasite control (Veerakumari, 2015). This kind of herbal medicine provides a valuable alternative to and complements the western veterinary drugs.

Method of administration of identified indigenous technologies

Result in Figure 2 reveals that majority (78.11%) of the agro-pastoralist practices oral method of administration which is a voluntary intake of fluid per cattle, 66.27% drenching method is a forceful intake of fluid through the mouth cavity into the system of the cattle, 59.17% inclusion into feed and 38.46% practices skin massage method of administration in the study area. While medicinal plants may appear to have limited role in these approaches, several medicinal plants and traditional medicines derived from them have been used to enhance immune response to several disease agents (Di Pierro, Rapacioli, Ferrara and Togni 2012; Ramakrishna, Goda, Baliga, and Munsh, 2011).

Table 3: Regularity of indigenous technologies usage by agro-pastoralist (n = 169)

Indigenous plants used	Species scientific name	$\bar{x}-value$	Mean
Ewuro	*Vernoniaamygdalina Del.*	3.69	1st
Efinrin	*Vernoniagrantii Olive*	3.29	2nd
Iyeye	*Euphorbia heterophylla Linn.*	3.26	3rd
Ata wewe	*Physalisperuviana L*	3.24	4th
Alubosa	*ClerodendrumrotundifoliumOliv.*	3.17	5th
Ibepe	*Carica papaya L.*	3.16	6th
Iyere	*Kigelia Africana*	3.1	7th
Dagunro	*Flueggeavirosa (wild) Voigt/ Securinega. Virosa*	3.07	8th
Ejirin-nla	*MemordicafoetidaSchumach*	3.04	9th
Efirinwewe	*Justiciaexigua +Ocimumbasilicum*	2.75	10th
Imi-esu	*Rhoicissustridentata (L.f.) Wild and R.B. Drummond*	2.67	11th
Ayin	*ZanthoxylumchalybeumEngl*	2.66	12th
Epa-ikun	*Asparagus tuberosum*	2.65	13th
Moringa	*Moringaoleifera Lam.*	2.63	14th
Taaba	*Nicotianatabacum L.*	2.57	15th
Erin mado	*Secamoneafricana (Oliv) Bullock*	2.56	16th
Kasu	*Cyphostemmaadenocaule (A.rich.)willd Drummond*	2.54	17th
Agbo	*HarrisoniaabyssinicaOliv.*	2.54	18th
Ojuologbo	*PhytolaccadodecandraL'Herit*	2.53	19th
Ewe ogbo	*Cassia occidentalis L.*	2.51	20th
Iwere-jeje	*Coleus latifoliusAndr, SennadidymotryaFresen*	2.48	21st
Aborere	*Justiciaexigua*	2.46	22nd
Ewe	*TetradeniaripariaHochst) Codd*	2.45	23rd
Egbogi	*Lagenariasphaerica*	2.42	24th
Abrangbe	*Cassia obtusifolia L*	2.41	25th
Aloko-agbo	*Sapiumellipticum (Hochst)*	2.36	26th
Ewe iyalode	*Veprisnobilus (Del.) mziray (Tecleanobilis)*	2.31	27th
Esekannakanna	*Sporoboluspyramidalis*	2.29	28th
Ewe aloe	*Aloe sp*	2.29	29th
Lapalapa	*Jatrophacurcas L.*	2.25	30th
Atayee	*Brillantaisiaowariensis P. Beauv.*	2.24	31st
Ewe amunimuye	*Curcubito maxima*	2.21	32nd
Ewe ato	*Justiciabetonica L*	2.19	33rd
Igbo	*Cannabis sativa L*	1.89	34th
	Grand mean	2.64	

Source: Field Survey, 2016
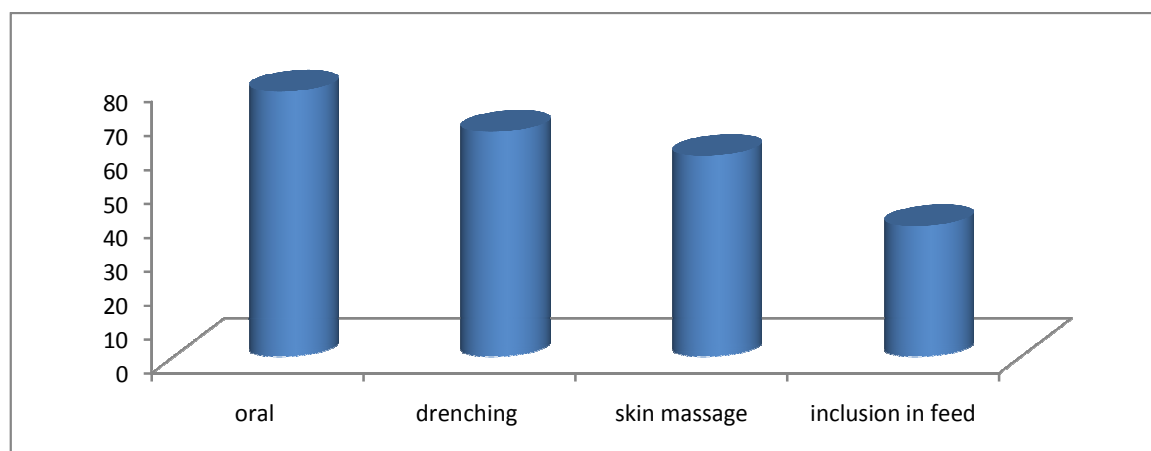
Figure 2: Method of administration of identified indigenous technologies for treatment of helminthes.

Preferred indigenous technology

Table 4 shows that respondents preferred using *Ewuro* with the mean value of ($\bar{x}$ =2.49), *Igbo* ($\bar{x}$ = 2.41), *Ata wewe*, ($\bar{x}$ = 2.39), *Esekannakana*, ($\bar{x}$ = 2.37), *Iyeye*, ($\bar{x}$ = 2.36), *Ibepe*, $\bar{x}$ = 2.34), *Moringa* ($\bar{x}$ = 2.33), *Ewe Aloe*, ($\bar{x}$ = 2.28), *Ewe ogbo*, ($\bar{x}$ = 2.22), *Ewe ato*, ($\bar{x}$ = 2.21), *Efirin*, ($\bar{x}$ = 2.23) and *Dagunro*, ($\bar{x}$ = 2.19) in the treatment of helminthes in the study area. These respondents preferred using these plant-based technologies compare to other plant for the treatment of helminths. The significance of helminthes has therefore been recognized by local people and herdsmen from the earliest times which have led to various attempts at controlling the effects through the use of medicinal plants. Fulani herdsmen in Nigeria recognize animal helminthosis to be a menace of greatest significance in cattle production, most especially calves of less than a year old. These pastoralists employ the usage of indigenous/traditional knowledge system which has been passed from generation to generation through oral tradition and practice to manage helminthes in their cattle. Nigeria is endowed with vast and readily available indigenous control methods that are within the reach of the herdsmen which they can choose from instead of depending only on modern technologies for feasible solutions that are available within their environment (Usman, Bzugu, Pur and Abdullahi, 2017).

Table 4: Preferred indigenous technology for the treatment of helminthes in cattle

Preferable indigenous plants	Species scientific name	Mean	S.D.	Rank
Ewuro	*Vernoniaamygdalina Del.*	2.49	0.66	1
Igbo	*Cannabis sativa L*	2.41	0.8	2
Ata wewe	*Physalisperuviana L*	2.39	0.73	3
Esekannakanna	*Brillantaisiaowariensis P. Beauv.*	2.37	0.81	4
Iyeye	*Euphorbia heterophylla Linn.*	2.36	0.89	5
Ibepe	*Carica papaya L.*	2.34	0.75	6
Moringa	*Moringaoleifera Lam.*	2.33	0.85	7
Ewe aloe	*Aloe sp*	2.28	0.83	8
Efirin	*Vernoniagrantii Olive*	2.23	0.78	9
Ewe Ogbo	*Cassia occidentalis L.*	2.22	0.81	10
Ewe ato	*Justiciabetonica L*	2.21	0.85	11
Dangunro	*Flueggeavirosa (wild) Voigt/ Securinega. Virosa*	2.19	0.76	12
Ejinrin-nia	*Memordicafoetida*Schumach	2.16	0.88	13
Kasu	*Cyphostemmaadenocaule (A.rich.)willd Drummond*	2.14	0.85	14
Egbogi	*Lagenariasphaerica*	2.14	0.89	15
Taaba	*Nicotianatabacum L.*	2.13	0.81	16
Aborere	*Justiciaexigua*	2.09	0.8	17
Lapalapa	*Jatrophacurcas L.*	2.08	0.94	18
Ayin	*ZanthoxylumchalybeumEngl*	2.02	0.92	19
Imi-esu	*Rhoicissustridentata (L.f.) Wild and R.B. Drummond*	2	0.85	20
Iyere	*Kigelia Africana*	1.97	0.87	21
Alubosa	*ClerodendrumrotundifoliumOliv.*	1.93	0.79	22
Efirinwewe	*Justiciaexigua +Ocimumbasilicum*	1.93	0.84	23
Erin mado	*Secamoneafricana (Oliv) Bullock*	1.92	0.91	24
Agbo	*HarrisoniaabyssinicaOliv.*	1.89	0.9	25
Iwere-jeje	*Coleus latifoliusAndr, SennadidymotryaFresen*	1.86	0.89	26
Epaikun	*Asparagus tuberosum*	1.86	0.89	27
Ojuologbo	*PhytolaccadodecandraL'Herit*	1.84	0.82	28
Ewe	*TetradeniaripariaHochst) Codd*	1.83	0.88	29
Abrangbe	*Cassia obtusifolia L*	1.79	0.81	30
Ewe amunimuye	*Curcubito maxima*	1.78	0.81	31
Ewe iyalode	*Veprisnobilus (Del.) mziray (Tecleanobilis)*	1.76	0.83	32
Aloko-agbo	*Sapiumellipticum (Hochst)*	1.69	0.81	33
Atayee	*Sporoboluspyramidalis*	1.67	0.77	34
	Grand mean	2.07	0.83	

Source: Field survey, 2016

Effect of treatment on faecal egg count (FEC)

Table 5 shows that conventional drug caused a significant decline between Day1 ($\bar{x}$ =

4300.00 SD±788.811) to Day 3 ($\bar{x} = 0.00$ SD±0.00). The herbal drug significantly cleared the worm loads between Day1 ($\bar{x} = 4500.00$ SD±623.61) to Day 4 ($\bar{x} = 0.00$ SD±0.00) while the no significant changes was observed in the control group. However, while the FEC increased faster after the third month for the animals in the herbal treatment group than the conventional the control remains chronically infected. FEC monitoring in a selective treatment approach unless

mandated by prescription-only legislation (Nielsen, Branan, Wiedenheft, Digianantonio, Garber, Kopral, Phillippi-Taylor, and Traub-Dargatz 2018; Becher, van Doorn, Pfister, Kaplan, Reist, and Nielsen, 2018). While it should be beneficial to reduce overall treatment intensity, the lack of FEC monitoring means that the typical approach remains to always treat the entire herd, and not leave a proportion untreated regardless of their maturity or need.

Table 6: Anova result showing mean differences and the effect of treatment on FEC EGGS.

Treatment	Herbal	Conventional	Control
Days	Mean ± SD	Mean ± SD	Mean ± SD
Day 1	4500.00 ± 623.61[a]	4300.00 ± 788.811[a]	4750.00 ± 1086.53[a]
Day 2	1010.00 ± 521.643[b]	680.00 ± 345.768[a]	5200.00 ± 918.94[c]
Day 3	410.00 ± 357.305[a]	0.00 ± 0.00[a]	5250.00 ± 824.958[b]
Day 4	0.00 ± 0.00[a]	0.00 ± 0.00[a]	4990.00 ± 2247.196[b]
1st month after	0.00 ± 0.00[a]	0.00 ± 0.00[a]	6700.00 ± 1159.502[b]
2nd month after	1810.00 ± 1384.397[b]	450.00 ± 772.082[a]	6100.00 ± 1197.219[c]
3rd month	2700.00 ± 1358.103[a]	2370.00 ± 1531.920[a]	6800.00 ± 1229.273[b]

*Means with different subscript are significantly different from each other at 0.05 level of significance

Effect of treatment on mean weight of cattle after 12 weeks

Table 7 shows that mean weight for cows exposed to herbal drug significantly change between week 0 ($\bar{x} = 84.20$ SD±3.293) and week 12 ($\bar{x} = 90.36$ SD±4.780). The conventional treatment significantly improves the weight gain between week 0 ($\bar{x} = 83.50$ SD±7.472) and week 12 ($\bar{x} = 85.65$ SD±7.405). There was significant weight loss observed in the control group from week 0 ($\bar{x} = 82.80$ SD±3.736) and week 12 ($\bar{x} = 76.68$ SD±6.435).

Table 7: Anova result showing mean differences and the effect of treatment on mean weight of cattle after 12 weeks

Treatment	Herbal	Conventional	Control
Weeks	Mean ± SD	Mean ± SD	Mean ± SD
0 week	84.20 ± 3.293a	83.50 ± 7.472a	82.80 ± 3.736[a]
2 weeks	86.68 ± 5.347[c]	83.00 ± 7.777[b]	80.54 ± 7.637[a]
4 weeks	87.17 ± 5.166[c]	83.65 ± 7.587[b]	78.05 ± 8.120[a]
6 weeks	87.99 ± 5.193[c]	84.51 ± 7.359[b]	76.37 ± 7.534[a]
8 weeks	90.80 ± 3.810[c]	85.25 ± 7.144[b]	76.55 ± 7.162[a]
10 weeks	89.81 ± 5.130[c]	86.23 ± 7.014[b]	77.59 ± 6.224[a]
12 weeks	90.36 ± 4.780[c]	85.65 ± 7.405[b]	76.68 ± 6.435[a]

*Means with different subscript are significantly different from each other at 0.05 level of significant

CONCLUSION AND RECOMMENDATION

Based on the findings of the study, there has been a progressive increase in the usage of indigenous technology over years and studies from literatures supports that thirty four (34) different herbs/plants were being used by settled agro-pastoralists among which were *Ewuro, Efirin, Iyeye, Alubosa, Ewe ibepe, Iyeye*, Dagunro, *Ejinrinnla*, *Ayin*,*Imi-esu*, *Epaikun*, and moringa. Based on multiple responses on method of administration of identified indigenous technologies used for treatment of helminthes, result revealed that majority of the agro-pastoralist practices oral method of administration in the study

area. Based on the findings of this study, it is recommended that:

1. Government should facilitate the establishment of unorthodox services in the rural communities to further increase utilisation of available services within medical sphere.
2. Since agro-pastoralists' patronage of traditional health care services has not been totally eradicated, prompt attention should therefore be on quality assurance for all stakeholders in health sector.
3. The animal health-care centers require expansion in terms of experienced personnel and equipment since most

settled agro-pastoralists in the rural areas patronize more of these animal health-care centers.

4. Preservation of all the identified indigenous technologies used by the Agro-pastoralist should be avoided to go extinction and educate them on the proper usage of anti-helminthes drugs and administration.

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ATTITUDE TOWARDS TRADITIONAL MEDICINE AND UTILISATION OF MODERN HEALTHCARE AMONG CROP FARMERS IN SAKI WEST LOCAL GOVERNMENT OF OYO STATE

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ABSTRACT

Farmers are typically more traditional in outlook and this may impede utilisation of modern healthcare and bear negative implication for morbidity and mortality. The aim of this study was therefore to examine attitude towards traditional medicine and utilisation of modern health care among crop-farmers in Saki West LGA, Oyo State. Using survey design, 200 copies of structured-questionnaire were administered via structured-interview to randomly selected respondents. Chi-square and contingency co-efficient were used to assess the significance and strength of associations between pairs of categorical variables respectively. Pearson Product Moment Correlation Coefficient was used to assess relationship between attitude and utilisation. Univariate analysis indicates that 55% and 45% of respondents maintained maximally and minimally positive attitude towards traditional medicine respectively. Further, 2.5%, 54.0% and 43.5% of respondents were non-utilisers, low utilisers and high utilisers of modern healthcare, respectively. Sex and marital status were not significantly associated with utilisation of modern healthcare ($p > 0.05$) but religion and education were ($p < 0.05$). There was a significant, inverse and fairly strong relationship between attitude towards traditional medicine and utilisation of modern healthcare ($r = -0.493$, $p = 0.000$). Being Muslim and having increased education are significantly associated with lower and higher utilisation of modern healthcare among famers in the study area. The more positive the attitude towards traditional medicine, the less the utilisation of modern healthcare among farmers in the study area. Farmers' patronage of modern healthcare should be improved through making modern medicine more responsive to farmers the way traditional medicine does.

Keywords: Attitude, Traditional medicine, Modern medicine, Farmers, Primary Health Care.

INTRODUCTION

In the developing world including Nigeria, farmers are under pressure to increase food production owing to increasing human population. Hence, agricultural production typically attracts attention but this is at the expense of the agricultural producer. Moreover, the climate-dependent, human energy-demanding attribute, owing to the less-mechanized nature of farming in developing societies like Nigeria implies that farmers' health is inextricably and deeply tied to their livelihoods. Climate change has exacerbated the challenges of agricultural production such that work productivity declines during hottest and wettest seasons (Kjellstrom and Crow, 2011; Dunne et al., 2013). Yet, farmers live almost exclusively in rural areas, the regions with poorest access to health infrastructures. This portends grave consequences for the health of farmers who are typically poorer and more traditional in outlook. This makes it logical for concerns to be raised with regard to farmer's attitude to traditional medicine and their utilisation of modern health infrastructures.

The World Health Organisation defined traditional medicine as 'the sum total of the knowledge, skills and practices based on the theories, beliefs and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness' (WHO, 2013: 15). Traditional medicine is an important component of health institution in sub-Sahara Africa. Its role in ensuring health for all in Africa cannot be overemphasised. The World Health Organisation recognizes the potential contribution of traditional medicine in progressing health systems (Staden, 2019). Traditional medicine is historically relevant to peoples of every land and climes. It appeals to the spirit–mind–body notion of holistic health. Traditional medicine incudes the use of animal products, plants and other culturally relevant objects in the promotion and restoration of health (Sen et al., 2011; Pan et al., 2014). The practice of traditional medicine invokes orders of cultural knowledge, customs and beliefs to instigate desired outcome (Gyasi, Siaw and Mensah, 2015). These and many more justifications make the utilisation of traditional medicine prevalent in African as well as global populations (James et al., 2018).

Paradoxically, absolute reliance on traditional medicine is a huge threat to the health of the population. Utilisation of traditional medicine is sometimes premised on supernatural conception of disease causation which may not be apt. In the

report of a qualitative study to explore cultural construction of health and illness among the Yoruba, Jegede (2002) asserted that among their research participant's explanation of sources of disease causation were supernatural causes including "enemies (*ota*), which include witchcraft (*aje*), sorcery (*oso*); gods (*orisa*) or ancestors (*ebora*)". Although these participants also recognized "natural illness (*aare*) and hereditary diseases (*aisan idile*)" (Ibid: 328), it is expectable that people's primary health orientation will impede their acceptance of modern healthcare. Jegede (2002) further reported that about two-thirds of their participants always frequented traditional healthcare centers prior to patronizing hospitals. Hospitals were typically considered after other choices became futile. No wonder many refer to hospitals as '*ile iku* (houses of death)' as cases are referred there at stages of intractability. Indeed, farmers' attitude towards traditional medicine and their utilisation of modern healthcare are bases of determining farmers' welfare status and asserting their right to health as fundamental human right which government is responsible for (Birn, 2018).

The modern healthcare system closest to farmers as a subset of the larger Nigerian population is the primary health care center. Primary health care (PHC) is the most basic of the modern health institutions, the others being secondary and tertiary health centers. The Primary Health Care was adopted in 1978 at an International Conference instigated by the WHO and UNICEF in Alma Ata, Kazakhstan, by 134 governments including Nigeria, as the strategy of attaining 'Health for All' (WHO, 1978) (Birn, 2018). PHC is a fundamental element of Nigeria's health system, and it is the first health center to be, ideally, contacted by individuals, the family and the community (NPHCDA, 2019). Among the eight components (services) of the primary health care are maternal and child care including family planning, immunization against major infectious diseases, prevention and control of locally endemic diseases, appropriate treatment for common ailments and injuries, as well as supply of essential drugs. Nigeria recorded tremendous success in its implementation of PHC between 1986 and 1992 during the reigns of Professor Olikoye Ransome-Kuti as the Minister of Health (Aregbeshola and Khan, 2017): primary health centers were local-government-focused, infrastructures were expanded, community health workers' training institutions were created to turn out health workers. These facilitated the achievement of the goal of 80% coverage of Universal Child Immunization (UCI). These tremendous successes were acknowledged by the great rating of the WHO Review Team (Lambo, 2015). The National Primary Health Care Development Agency (NPHCDA) was created to sustain these successes

in 1992 (Fatusi, 2015). Unfortunately, the incursion of the military in Nigeria politics and governance in 1993 disrupted the Nigerian PHC success story (Aregbeshola and Khan, 2017) for which the nation is yet to recover from. Indeed, primary health centers are places of reaping the rewards of modern heath care, for which the farmer's health stand to benefit. The role of attitude towards traditional medicine in this instance is aptly of interest. Attitudes are motivated by peoples' beliefs and knowledge as well as experiences. This work was therefore designed to examine attitude of crop farmers towards traditional medicine and utilisation of modern healthcare in Saki West Local Government Area of Oyo State, Nigeria

METHODOLOGY

The survey design was adopted for this study. The target population was the crop farmers of Saki West Local Government Area (LGA) of Oyo state. Oyo state is one of the six states of southwestern Nigeria, the homeland of the Yorùbá people. The LGA has a land mass of 300 km^2. The people of the LGA are typically farmers, but most people diversify their livelihood by concurrently engaging in trading and artisanal works. The LGA is divided into eleven political wards. According the 2006 population and housing census, the total number of people in the LGA was 278,002 (National Population Commission, 2007). This is taken as the total population (N) for the study because the people are typically farmers. The sampling procedure was random and systematic. The modified Cochran formula displayed below was used to calculate sample size:

$$\mathbf{n} = \frac{Npqz^2}{e^2(N-1)+pqz^2} \ \dots\dots (1)$$

Where *e* is the desired level of precision (i.e. the margin of error) = 7%; p is the (estimated) proportion of the population which has the attribute in question at assumption of 50%= 0.5; q is 1–p; z is obtained from 95% confidence on z table as 1.96 and n is the sample size. The calculated sample size was 196. This was increased to 200. Five wards were randomly selected from the eleven in the LGA. Villages/communities in the selected wards were identified and two villages were randomly selected from each ward. The villages were Agbele, Isale Abudu, Idi Igba, Apinite, Eko tan, Isale Oke, Logbogbo, Odo Okerete, Igboro and Sangote. The study took place in these ten villages. Systematic sampling principle was invoked to select twenty respondents in each of the ten communities. Data collection was achieved using structured questionnaire. This was administered via structured interview. A Yorùbá version of the questionnaire was created to be able to converse with respondents that do not speak English language. Respondents' rights to willful participation was respected. Study details were explained to participants and their

anonymity was assured before their acceptance to participate in the study. Their informed consent was obtained by appending their signature. Data collection took place between March and May, 2018. Response rate was 100%.

Attitude towards traditional medicine was defined as respondent's feelings, mental states and opinions regarding traditional medicine. It was measured using a ten-item author-constructed Likert scale (see table 2 for items in the scale). Responses were scored 1 to 5 such that the higher the score, the more positive the attitude towards traditional medicine. *Utilisation of modern healthcare* was defined as utilisation of primary health care centers. This utilisation was defined as the extent to which respondents make use of primary health care centers. It was measured using a six-item author-constructed scale assessing the degree to which respondents generally patronize modern health centers (see table 2). Responses were scored 0 to 2, such that higher score implies greater utilisation of modern healthcare.

Distributions of data were assessed using frequency counts and percentages. Cross-tabulation and chi-square were used to show distributions and significance of associations between pairs of variables respectively. Contingency co-efficient was used to assess the strength of significant associations. Pearson Product Moment Correlation Coefficient was used to assess relationship between attitude towards traditional medicine and utilisation of modern healthcare. All data were analyzed using Statistical Package for Social Sciences (version 21).

RESULTS AND DISCUSSIONS

Table 1 shows that majority (72.0%) of respondents were male. This implies that agriculture is dominated by men in the study area. Most respondents (75.0%) were married. The proportion of those who were divorced (5%) is probably an indication of growing level of marriage instability in the study area. Most respondents (43.5%) had no formal education. The highest educational qualification of up to a quarter of respondents was primary school certificate. The distribution of educational achievement of respondents indicates poor status of basic education among farmers. This distribution implies that illiteracy is still a major problem confronting farmers. However, the proportion of respondents with tertiary education is considerable and cheering given the poor-educational condition of farmers in the study area. The majority (58%) of respondents were Muslims, while Christians constituted 36.5%. About 1 in every 20 respondents (5.5%) were practitioners of traditional religion. This indicates a considerable level of cultural survival among respondents. The distribution of socio-demographic characteristics of respondents is shown in Table 1.

Table 1: Distribution of respondent's socio-demographic characteristics

Variables	Categories	Frequency	Percentage
Sex	Male	144	72.0
	Female	56	28.0
Marital status	Single	28	14.0
	Married	150	75.0
	Divorced	10	5.0
	Widowed	12	6.0
Education	No formal education	87	43.5
	Primary school certificate	48	24.0
	Secondary school certificate	37	18.5
	Tertiary education	28	14. 0
Religion	Islam	116	58.0
	Christianity	73	36.5
	Traditional Religion	11	5.5

Item analysis of measures of attitude towards traditional medicine and utilisation of modern healthcare

The analysis of items used in the assessment of attitudes and utilisation presented in table 2 shows that 71.5%, 70% and 65.0% of respondents strongly agreed that only traditional medicine can cure diseases because they are caused by spirits, traditional medicine was pocket friendly and time saving respectively. Further, 75% of respondents strongly disagreed that traditional medicine could have devastating side effects while 59.5% strongly believed that in the co-existence of traditional and modern medicine. Distribution of responses to these items have generally impressed the idea that traditional medicine is a popular phenomenon among farmers in the study area. Table 2 further shows that 35.5% and 43.0% were certain that they patronized health center the last time they were sick and only when sickness is severe. However, 86.5% regarded themselves as consistent use of health center. These show that respondents reported diverse range of utilisation of health center.

Table 2: Analysis of items used in the assessment of attitude towards traditional medicine and utilisation of primary health care centers

Attitude towards traditional medicine

s/no	Items	Strongly agree	Agree	Unsure	Disagree	Strongly Disagree
1	Traditional medicine is more pocket friendly	70.0	21.0	0.50	5.0	3.5
2	Total healing can only be achieved using traditional medicine	50.5	27.5	2.5	15.0	4.5
3	Patronizing traditional medicine is always time saving	65.0	29.0	1.0	4.0	1.0
4	Aside from healing diseases, traditional medicine agrees with my spirit	52.0	13.0	10.0	10.0	15.0
5	Traditional medicine can have devastating side effect	4.0	3.5	15.0	2.5	75.0
6	Traditional medicine works faster	44.5	40.0	4.5	1.0	10.0
7	When I am sick, I prefer to see a traditional healer	43.0	33.0	4.0	3.5	16.5
8	Traditional medicine is better for the people of my ethnicity than modern medicine	38.5	47.0	5.5	1.5	7.5
9	Some diseases are caused by spirits which only traditional medicine can cure	71.5	15	8.5	0.5	4.5
10	Our healthcare system cannot be adequate without inclusion of traditional medicine	59.5	30.0	6.5	0.5	3.5

Utilisation of primary health care centers

s/no	Items	Not true at all (%)	I'm not sure (%)	Very true (%)
1	The last time you were sick, did you patronize health care center?	50.0	14.5	35.5
2	Is health care center your major source of health care?	7.0	15.5	77.5
3	I patronize primary health care center only when traditional medicine fails.	10.5	0.5	89.0
4	I patronize primary health care center only when my sickness is severe	55.0	2.0	43.0
5	I am a consistent user of primary health care center	3.5	10.0	86.5
6	I patronize primary health care center only when someone/people pressurize me to do so	12.0	3.0	85.0

Univariate analysis of attitude towards traditional medicine and utilisation of modern healthcare

The univariate distributions presented in Table 3 indicates the closely bipolar distribution of respondents in terms of the dimensions of their attitude and utilisation. The proportion of respondents who maintained maximally positive attitude towards traditional medicine (55%) was a strong indication that traditional medicine is staunchly popular among respondents. This is comparable with the findings of Stanifer *et al*. (2015) who conducted mixed methodology study of the determinants of the use of traditional medicine in Kilimanjaro, Tanzania. They reported that 55.7% of their survey participants use traditional medicine. Although the finding of Stanifer *et al*. (2015) is not directly relevant to current finding, the reported proportion of traditional medicine users is arbitrarily reflective of attitude towards traditional medicine in Africa sub-populations.

Only 2.5% of respondents are non-utilisers of modern healthcare but the majority (54%) were low utilisers of same. Nevertheless, over 4 out of every 10 respondents were high utilisers of modern healthcare. This distribution suggests considerable lag in the utilisation of primary health care centers among farmers in the study area. This finding is comparable with the findings of Alarima and Obikwelu (2018) who conducted an assessment of utilisation of primary health care services among

settled Fulani agropastoralists in Ogun State, Nigeria. Alarima and Obikwelu (2018) reported that 15.0%, 83.3% and 1.7% of their respondents always, occasionally and never make use of primary health care services, respectively. The two

sets of finding reflect that those who never use modern medicine are very marginal. The differences in other proportions reported and current findings is probably due to fact that the target population of the two studies are different.

Table 3: Distribution of dimensions of attitude towards traditional medicine and utilisation of modern healthcare

Variables	Dimensions	N	%
Attitude towards traditional medicine*	Minimally positive	90	45.0
	Maximally positive	110	55.0
Utilisation of modern healthcare**	Non-utilisers	5	2.5
	Low utilisers	108	54.0
	High utilisers	87	43.5

*The means (below the mean and mean; above the mean) of summary scores were used to Categorise respondents into two. **Respondents' lowest, highest and mean score were found to be 0, 10 and 5, respectively. Respondents scoring 0, between 1 to 5 and 6-10 were Categorised as non-utilisers, low utilisers and high utilisers respectively.

Socio-demographic characteristics and utilisation of modern healthcare

The cross-tabulations in Table 4 indicates that all non-utilisers were male and they also dominated the low and high utilisation sub-groups. The chi-square of this analysis was 0.397 ($p > 0.05$). This implies that sex is not a significant factor in utilisation of modern healthcare among the famers. People utilise and will utilise modern healthcare irrespective of their sex. However, Alarima and Obikwelu (2018) reported that sex was a significant determinant of utilisation of primary healthcare services among settled Fulani agropastoralists in Ogun State, Nigeria. This calls for more studies to establish the role of sex in the patronage of modern medicine. Married respondents dominated the three levels of utilisation. They constituted 80%, 71.3% and 79.3% of non-utilisers, low utilisers and high utilisers, respectively. The chi-square of this analysis was 3.929 ($p > 0.05$). Marital status is not significantly predisposing towards high or low utilisation of modern healthcare among the famers. Similarly, Alarima and Obikwelu (2018) reported that marital status was an insignificant determinant of utilisation of primary healthcare services in their study among settled Fulani agropastoralists in Ogun State, Nigeria. This reflects a growing conclusion to the effect that marital status is not a factor of significant importance in the patronage of modern healthcare. Muslims are the majority of non-utilisers (80%) and low utilisers (65.7%).

However, Christians were the majority (50.6%) among high utilisers of modern healthcare. The chi-square of this cross tabulation was 15.182 ($p < 0.05$). Being Muslim is significantly more predisposing to lower utilisation of modern healthcare among famers in the study area. This is probably a reflection of some peculiarities of Muslims and their social circumstances in the study area which calls for further studies. For instance, education could be lower among Muslims and education was found to be significantly associated with utilisation of modern healthcare. The contingency coefficient of this analysis shows that the extent of the association between religion and utilisation of modern healthcare is 26.6%. Table 4 further shows that 54.6% of low utilisers had no formal education. However, these respondents with no formal education constituted only 13.8% of high utilisers. Meanwhile, respondents with tertiary education constituted majority of high utilisers (32.2%). The chi-square of this cross tabulation was 16.194 ($p < 0.05$). Increasing education is significantly more predisposing to higher utilisation of modern healthcare among the famers. This finding is in tandem with the finding of Oladigbolu *et al*. (2017). In their report, Oladigbolu *et al*. (2017) stated that educational status was a significant predictor of utilisation of healthcare services. The extent of the association between education and utilisation of modern healthcare as assessed with contingency coefficient is 27.4%.

Table 4: Cross-tabulation of sex, marital status, religion, education and utilisation of modern healthcare

Socio-demographic characteristics	Sub-groups	Utilisation of modern healthcare		
		Non-utilisers	Low utilisers	High utilisers
Sex*	Male (%)	100.0	95.4	94.3
	Female (%)	0.0	4.6	5.7
Marital status**	Single (%)	20.0	13.9	13.8
	Married (%)	80.0	71.3	79.3
	Divorced (%)	0.0	6.5	3.4
	Widowed (%)	0.0	8.3	3.5
Religion***	Christianity (%)	20.0	25.9	50.6
	Islam (%)	80.0	65.7	47.1
	Traditional religion (%)	0.0	8.3	2.3
Education****	No formal education (%)	0.0	54.6	13.8
	Primary education (%)	40.0	18.5	29.9
	Secondary education (%)	40.0	13.0	24.1
	Tertiary education (%)	20.0	13.9	32.2
	Total	100	100	100

*Chi-square = 0.397, p =0.820
**Chi-square = 3.929, p =0.686
***Chi-square = 15.182, p =0.004; Contingency co-efficient = 0.266, (p =0.001)
****Chi-square = 16.194, p =0.013; Contingency co-efficient = 0.274, (p =0.012)

Relationship between attitude towards traditional medicine and utilisation of modern healthcare

The Pearson's r (-0.493, p =0.000) in Table 5 indicates a significant, inverse and fairly strong relationship between attitude towards traditional medicine and utilisation of modern healthcare. The inverse direction of this correlation indicates that the more favourable the attitude towards traditional medicine, the less the utilisation of modern healthcare among the farmers. This finding is indirectly similar to the findings of Stanifer *et al.* (2015) who reported that strong cultural identity was one of the significant determinants of the use of traditional medicine in Kilimanjaro, Tanzania. In addition, the current finding is indirectly similar to the finding asserting that attitude towards use of primary healthcare service was a significant determinant of utilisation of primary healthcare services (Alarima and Obikwelu, 2018). Indeed, respect for traditional medicine is a significant threat to high patronage of modern medicine. By implication, this respect is a threat to farmer's productivity because health is an essential element of human capital which positively impacts productivity and economic growth (Adeoti and Awoniyi, 2014). The rendering of modern medical services in this part of the world needs to emulate some attributes of traditional medical practices, such as being more pocket friendly, respecting cultural dictates, lessening bureaucratic bottlenecks, in order to be more appealing to people.

Table 5: Pearson's *r* indicating relationship between attitude towards traditional medicine and utilisation of modern healthcare

		Attitude towards traditional medicine	Utilisation of modern healthcare
Attitude towards traditional medicine	R	1	-0.493
	p value		0.000
Utilisation of modern healthcare	R	-0.493	1
	p value	0.000	

CONCLUSIONS AND RECOMMENDATION

Sex and marital status are not significantly associated with utilisation of modern healthcare. However, religion and education are significantly associated with utilisation of modern healthcare among the famers. Being Muslim and having lower education are significantly more predisposing to lower utilisation of modern healthcare among the famers. The more positive the attitude towards traditional medicine, the less the utilisation of

modern healthcare among the farmers. It is therefore incumbent on units of government, non-governmental organisations and other stakeholders to focus on the health of food producers through improving patronage of modern health facilities by improving semblance of the two systems.

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WOMEN INVOLVEMENT IN LOCUST BEANS PROCESSING AS A LIVELIHOOD ACTIVITY IN EJIGBO LOCAL GOVERNMENT AREA, OSUN STATE, NIGERIA

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ABSTRACT

The study assessed the involvement of women in the production of locust beans as a livelihood activity in Ejigbo Local Government Area of Osun State. Specifically, the study ascertained the locust beans processing activities which the women were involved in, determined the profitability of locust beans and production constraints. A two-stage sampling technique was used to select a total of 120 respondents for data collection. Data collected were analysed using frequency counts, percentages, means and standard deviation as well as correlation analysis for inferential statistics. The results showed high involvement of the women in the processing of locust beans. Their net profit was found to be ₦1,499.36 per production cycle with benefit cost ratio of 1.84. The most pressing constraints identified include high time demand ($\bar{x}$=3.98±0.16) and high cost of firewood ($\bar{x}$=3.93±0.29) among others. Results of hypothesis test showed that age (r=0.456), household size (r=0.256) and years of experience (r=0.453) were significantly associated with involvement in locust beans processing activities. It was concluded that women were profitably involved in locust beans processing as a livelihood activity despite its time consuming nature and increasing inputs' cost. Necessarily, labour and time saving technologies should be employed for reducing the drudgery of the processing activities and to improve productivity.

Keywords: Livelihood, Production, Involvement, Women, Processing activities

INTRODUCTION

Locust bean is a traditionally revered condiment produced from the seeds of *Parkia biglobosa*. The crop is an important economic tree legume of considerable multipurpose importance (Nwaokoro and Kwon-Ndung, 2010). It bears elongated round flowers which develop into sweet flavoured yellow-pulpy pods enclosing the seeds (Ifeanyieze *et al.,* 2016). It is predominantly grown by small-holder farmers for diverse needs. Explicitly, the plant is a good source of food, medicines, glaze for ceramic pots, animal fodder, firewood, and charcoal production as well as tree cover (Alao, 2010; Olapade-Ogunwole, *et al.* 2011; Farayola, 2012).Thus the cultivation of this tree can be seen as an important economic activity for many in Africa, including a large portion of women.Specifically, the seeds obtained from the harvested fruits are processed through fermentation for culinary utilisation. Basically the processing entailed a number of activities ranging from sorting or cleaning of the raw beans followed bywashing and de-hulling, boiling, separating and fermenting of the cotyledon. The fermented cotyledon is then mashed to obtain the marketable product whose taste is widely savoured in traditional dishes.

The product is traditionally valued for its flavouring ability, taste enhancement quality and rich nutrient source. In fact, it is a local source of lipid (29%), protein (35%), carbohydrate 16% among others and also enhances the intake of minerals like calcium, phosphates, iron content as well as essential fatty acids and vitamins (Nwakoro and Nkwan-dung, 2010).The importance of the aromatic locust bean is further underscored with the advent of the growing health concern over the industrially produced artificial food additives as condiments. With respect to this, Ifeanyieze *et al.,* (2016) observed the growing interest in natural food ingredients like locust bean as additives in consumer diets. These espouse the viability of the local enterprise through which it is produced in rural food production and livelihood.

Worthy of note is the gender specificity of the locust bean production enterprise for rural women livelihood. This stems from the operation of the laborious processing activities up to the final marketingof locust beans by the rural women. This affirms the fact that agricultural processing are traditionally regarded as women home based activities and livelihood sources (FAO, 2011; Patil and Babu, 2018). This highlights the characteristic small-scale production domiciled within the homestead or family yard and which employs traditional or crude tools and methods culpable for limited productivity. This underlines the observation noted in literature that the production has not increased substantially due to associated problems and poor standardization measures for products' marketing (Ifeanyieze *et al.,* 2016;). In fact, it is hard to ascertain if income from products sale adequately compensates the resources invested in the processing activities.This is priced for discouraging new entrants from taking up the enterprise as livelihood source. Related to this, Adisa *et al.* (2014) indicated that the locust beans processors are somewhat associated with poverty despite its high demand. However, the enterprise has remained critical for the engagement of substantial proportion of rural women in Nigeria. This makes it imperative for the investigation of the economic value of women involvement in the enterprise. In realization of this need, this study was poised to generate evidence on the profitability

of involvement vis-à-vis the constraints to the processing of locust beans. This study specifically described the socioeconomic characteristics of women involved in locust bean production; ascertained their level of involvement in the activities, determined the profitability of locust beans processing as a livelihood activity and identified the constraints faced by the women in the processing activities.

The hypothesis stated for the study is that: There is no significant relationship between selected socioeconomic characteristics of women and their involvement in locust bean production.

METHODOLOGY

This study was carried out in Ejigbo town lying on latitude 7^0 5'N and longitude 4^0 8'E in Osun State, Nigeria. The population of the study comprised the locust bean processors who were basically rural women in the area. Sample selection for the study was done with the use of a two-stage sampling procedure. At first, purposive selection of two communities namely Olla and Isoko was done. This was based on the public opinion of the two communities as being dominated by expert locust bean producers. Following this, systematic sampling method was used to select 60 women processors from each community to give a total sample size of 120. Data collection was done with the use of validated interview schedule for eliciting information on the processors' socioeconomic characteristics, the processing activities that were involved in, their inputs' costs and selling prices as well as the constraints faced in the processing activities. Involvement in the processing activities was measured on a binary scale involving scoring of any identified activity as 1 and otherwise 0. Thus, the total number of identified activities gives the respondents' involvement score used as the dependent variable and Categorised into 3 levels using the mean and standard deviation. More so, the enterprise profitability index was measured with the computations of total production costs and earnings from sales for cost and return analysis, Gross Margin (GM) and Benefit Cost Ratio (BCR). Constraints faced in the processing activities were measured on 4-point scale of highly severe, severe, less severe and not severe scored 4, 3, 2 and 1, respectively. Accordingly, data collected were analysed with frequency counts, percentages, means and standard deviation for description, while correlation analysis was employed for inferential analysis.

RESULTS AND DISCUSSION
Socioeconomic characteristics

Results in Table 1 shows that the mean age of respondents was 46.57 ±12.4years and majority (75%) were married. This indicated that the women had family responsibility which their involvement in locust bean production might contribute to. Majority (73.3%) had no formal education. This highlights high illiteracy level among the processors and this could result in low level of awareness and accessibility to labour saving technologies which could enhance efficiency and productivity. The mean household size was 6 which could imply relative availability of family labour for servicing the spectrum of processing activities. More so, majority (71.7%) of the respondents had locust bean processing as their main occupation and the other major engagement of the women was farming (24.2%) thereby reflecting some level of diversified livelihood of the women processors. Most of the respondents were low income earners as reflected in their mean annual income of ₦142,483.33± 55,029.74 which is far less than the year 2011 Nigeria minimum wage of N18, 000.00 per month. This corroborates the view of Adisa *et al.* (2014) that locust beans producers were often more or less poor.

Furthermore, locust beans processing skills was mainly inherited from the parents (68.3%) and friends (19.2%), while their mean years of experience was 16.38±10.09. This implies that many of them had being involved in the activities for about 2 decades which could mean that majority of the processors had vast experience in locust bean processing.

Level of women involvement in locust bean processing

Results in Table 2 shows that all the respondents were always ($\overline{x}$ = 3±0.00) involved in the cleaning, sorting washing and blanching of seeds as well as fermentation. The processing activitiesin which the women were least involved are depodding ($\overline{x}$ = 1.28±0.66) and production of raw materials ($\overline{x}$ = 1.23±0.59). Overall, the grand mean of 2.68±0.46 indicates that most of the women were always involved in the various processing activities. This reveals that the women processors personally carry most of the laborious locust beans production activities. This investment of personal energy could be strategic for limiting production expenses and to optimize resource utilisation for greater returns from the enterprise. This finding corroborates the positions of Adejumo *et al.* (2013) and Owolarafe *et al.* (2013) among other studies that women were highly involved in the processing and marketing of locust beans.

Table 1: Results of socioeconomic characteristics of locust beans processors

Variable	Frequency	Percentage	$\overline{x} \pm \delta$
Age			46.6 ± 12.4 years
<30	6	5.0	
30-60	95	79.2	
>60	19	15.8	
Marital status			
Single	5	4.2	
Married	90	75.0	
Widowed	25	20.9	
Educational status			
Primary	20	16.7	
Secondary	10	8.3	
Tertiary	2	1.7	
No formal education	88	73.3	
Household size			6 ± 2 people
1-5	61	50.8	
6-10	55	45.8	
11-15	4	3.3	
Main occupation			
Locust bean processing	86	71.7	
Artisan	3	2.5	
Trading	2	1.7	
Farming	29	24.2	
Annual income (₦)			₦142,483.33 ±
₦61000-100000	42	35.0	55,029.737
₦101000-150000	18	15.0	
₦151000-200000	48	40.0	
₦201000-250000	12	10.0	
Secondary occupation			
Locust bean processing	34	28.33	
Artisan	12	10.00	
Trading	19	15.83	
Farming	55	45.83	
Method of skill acquisition			
Parent	82	68.3	
Friend	23	19.2	
Apprenticeship	15	12.5	
Years of experience			16.38 ± 10.09
1-10	38	31.7	
11-20	54	45.0	
21-30	13	10.8	
31-40	14	11.7	
41-50	1	0.8	

Source: Field survey, 2018

Profitability of locust bean production

The results in Table 4 show that cost of locust bean seeds constituted highest proportion (45.6%) of the total cost while the least among the variable cost was firewood (8.4%). Also, 13.4 percent of the total cost encompasses the depreciation of the fixed cost for fifteen years. The cost of transport constitutes 18.5 percent of the total cost. This was found to be relatively low; it may be as a result of nearness to their farms, and the market for the purchase of raw materials and sales of their products. The average total cost of production per cycle was estimated as ₦1,775.83 while the average total revenue from the sales of products was ₦3,275.00. The gross margin was found to be ₦1,737.34, while the net income was estimated as ₦1,499.17 per production cycle. This shows that the process derives a net gain of about ₦1,500 per cycle of locust beans production. Finally, the benefit-cost ratio (BCR) of 1.84 implies that every ₦1 invested in locust bean processing yielded ₦0.84 profit. These reveal that the enterprise was profitable as it yielded extra income over the investments into the business. This is in line with the findings of Olapade *et al.* (2011) and Akintan *et al.* (2013) which indicated that

locust beans processing was a profitable and viable enterprise.

Table 2: Distribution of respondents by involvement in locust bean processing

Activities	$\bar{x}$	δ	Ranking
1. Cleaning of the seeds	3.00	0.00	1st
2. Boiling of the seeds	3.00	0.00	1st
3. Dehulling of the seeds	3.00	0.00	1st
4. Washing of the seeds	3.00	0.00	1st
5. Blanching of the seeds	3.00	0.00	1st
6. Fermentation	3.00	0.00	1st
7. Packaging products using polythene, leaves, etc	2.99	0.91	2nd
8. Marketing of finished product (condiment|)	2.98	0.13	3rd
9. Sourcing of raw materials	2.83	0.38	4th
10. Measurement of raw materials	2.81	0.42	5th
11. Value enhancement of the product such as salting	1.88	0.32	6th
12. Depodding (shelling of matured pods)	1.28	0.66	7th
13. Production of raw materials	1.23	0.59	8th

Table 2: Results of level of women involvement in locust beans processing activities
Source: Field survey, 2018
Grand mean = 2.68±0.46

Table 3: Distribution of respondents according to their level of involvement in locust beans processing (n=120)

Level	Frequency	Percentage
Low Less than 2.22	15	12.5
Medium (Between 2.22 and 3.14)	25	20.8
High (above 3.14)	80	66.7

Source: Field survey, 2018
Mean = 2.68; Standard deviation = 0.46

Table 4: Cost and return estimates of locust bean production per processing cycle

Items description	Average value (₦)	Proportion (%)
Average total revenue (3 Congos per cycle)	3,275.00	
Fixed cost after depreciation (Mortar and pestle, pot for fifteen years)	238.17	13.4
Total fixed cost	238.17	
Variable cost		
The average cost of 3 congos locust bean seeds	808.83	45.5
Firewood	150.00	8.4
Transportation cost	250.00	14.1
Labour cost	328.83	18.5
Total variable cost	1,537.66	
Total cost	1,775.83	
BCR (Benefit Cost Ratio)	1.84	
Profit (TR-TC) for a cycle	1,499.17	
Average number of production on a monthly basis	13.07	
Average monthly net profit	189,504.2	
Average annual net profit	2,274,050.4	
Gross margin (TR-TVC)	1,737.34	

Source: Field Survey, 2018

Constraints faced inprocessing activities

Results in Table 5 show that majority of the processors consented that the highly severe constraints faced were the high time-consuming nature of the activities ($\bar{x}$=3.98 ± 0.16), scarcity and high cost of firewood ($\bar{x}$=3.93 ± 0.29), poor production capacities ($\bar{x}$=3.58 ± 0.62), small-scale production per cycle ($\bar{x}$=3.23 ± 0.73). This reflects high severity of problems associated with the processors' reliance on use of crude and traditional tools for their activities. This substantiates the position of Farayola *et al.* (2012) which asserted the necessity for the adoption of improved processing methods in line with international

standard in order to optimize the potentials of the enterprise.

Hypothesis testing results

Results in Table 6 show that age (r=0.456; P< 0.05), household size (r=0.256, P< 0.05), and years of processing experience (r=0.453; P< 0.05) had significant positive relationships with involvement in locust bean processing activities.

This means that the older or more experienced and the higher the number of family members of women, the more they are involved in locust beans processing activities. This is in line with the factors identified by Farayola *et al.* (2012) as including length of experience, age and production size. This might be underscored by increased household responsibility necessitating greater exploration of the enterprise as a livelihood source.

Table 5: Constraints to women locust bean processing (n=120)

Constraints	Mean	Standard deviation	Ranking
Time-consuming	3.98	0.16	1st
Scarcity and high cost of firewood	3.93	0.29	2nd
Poor production capacities	3.58	0.62	3rd
Inadequate access to high level market	3.12	0.39	4th
Inadequate access to training on improved methods	2.31	0.63	5th
Increasing cost of locust bean seeds	2.28	0.61	6th
Water scarcity during dry season	2.21	0.59	7th
The high cost of transportation	2.15	0.46	8th
Poor finance base as enterprise seed money	1.98	0.59	9th
The high cost of labour	1.94	0.57	10th
Inadequate storage facilities for processed products	1.49	0.58	11th
Ineffective preservation methods	1.05	0.22	12th
Unavailability and affordability of modern packaging material	1.02	0.18	13th

Source: Field Survey, 2018

Table 6: Result of correlation analysis of selected socioeconomic characteristics with involvement in locust bean processing

Variables	The correlation coefficient (r)	P-value	Decision
Age	0.456**	0.000	Significant
Years of education	0.504	0.126	Not significant
Household size	0.256**	0.005	Significant
Years of experience	0.453**	0.000	Significant
Income	0.677	0.120	Not significant

**Correlation is significant at the 0.05 level (2-tailed).
Source: Field Survey, 2018

CONCLUSION AND RECOMMENDATION

This study concluded that rural women were highly involved in locust beans processing activities for their livelihood despite the limitations posed by the high level of drudgery involved and increasing inputs costs. Their involvement was economically viable as tangible profits were gained over the returns on investment in the production cycles. As such, it is recommended that labour saving technologies that could preserve the traditional valued taste and aroma should be adopted by the women in other to improve their productivity and consequent increased income.

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EFFECTS OF SOCIAL CAPITAL DIMENSIONS ON OUTPUT AND GROSS MARGIN OF CASSAVA FARMERS IN OSUN STATE

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ABSTRACT

This paper investigated the effects of social capital dimensions on output and gross margin of cassava farmers in Osun State. A multi-stage sampling procedure was used for selecting 100 respondents for the study. Data were analysed using descriptive statistics, budgetary technique, social capital indices, and Ordinary Least Square model. The results showed average values of 48 years for age, 14 years for years of experience, 8 persons for household size, and 5ha for farm size. The estimated costs and return of cassava farmers per hectare of land on the average were ₦153,577.60 and ₦329,693.40 per annum whereas the total revenue on the average was ₦450,000 while the gross margin and net income were ₦328,151.30 and ₦329,032.80, respectively. The benefit cost ratio and labour efficiency analysis were 2.930 and 6.230, respectively. Age (5.747), farm size (0.463), decision making index (0.590) and labour contribution index (0.021) were significant factors affecting the output of cassava farmers while, years of education (0.372), farm size (0.572), membership index (0.448), meeting index (0.530) and decision-making index (0.450) were significant factors affecting the gross margin of cassava enterprise. The study concluded that social capital dimensions are among key variables affecting output and gross margin of cassava farmers. Following from the findings of the study, farmers should participate more actively in group activities as effective participation in association's decision making process enhances access to productive resources such as credit, labour among others.

Keywords: Social capital dimensions, Output, Gross Margin, Cassava farmers, Osun State

INTRODUCTION

Cassava (*Manihot esculenta* crantz) is regarded as the most important root crop in Nigeria (Adofu *et al*., 2011; Umunakwe, 2015). Nigeria is currently the largest producer of cassava in the world with an annual output of over 59 million tons (FAOSTAT, 2019). However, the production is mostly done by rural smallholder farmers. These small holders are cultivating less than two hectares of land and their production is with crude farm tools, obsolete farming practices, and non-availability of inputs among other things (Haruna *et al*., 2008), which yield lower output, resulting to low profitability in cassava enterprise. Cassava output could increase by raising both the quality and quantity of inputs such as improved varieties, fertilisers, herbicides, pesticides among others. However, these small holder farmers cannot afford these investments due to their limited access to credit (Liverpool *et al*., 2011).

Consequently, the farmers have organised themselves into social networks to improve their access to credit. Participation in the social network generates social capital which has been defined as networks of social relations and norms which govern interactions among individuals, households and communities, and could help to facilitate access to financial resources (Imandoust, 2011). This significantly improves the ability of cassava farmers with no or few savings to meet their financial needs for agricultural inputs (Swain *et al.,* 2008).

Social capital is highly dependent on collective action, cooperation, reciprocity and interrelationship among the households with likelihood of access to various forms of social support to obtain some collective benefits (Warren, 2008). These benefits are for the entire group, nevertheless, it can as well be captured by farmers within the group (Warren, 2008). These benefits generated through social capital could improve output and gross margin of cassava farmers. However, many studies (Isham, 2002; Okunmadewa *et al*., 2007; Hazell *et al.,* 2008; Yusuf, 2008 and Anyiro, 2014) on social capital are largely focused on issues such as poverty, welfare and adoption. Not much has been done with respect to output and gross margin.

Following from this, there is a need to assess the effects of social capital dimensions on output and gross margin of cassava farmers in Osun State. Specifically, the study described the socioeconomic characteristics of cassava farmers in the study area, examined the dimension of social capital in the study area, determined the costs and returns to cassava production in the study area, and determined the effect of social capital on output and gross margin of cassava farmers in the study area.

METHODOLOGY

The study was conducted in Osun State. The State has a total annual rainfall of 1570mm and temperature which falls between 25℃ and 27℃. The State has a total land area of 9251km (3572 sq mi) with a population of about 4,137,627 as at 2005. There are diverse forms of social capital networks in Osun State. The chief occupations of the people were business, trading and agriculture. Food crops, such as cassava, yam, maize, and vegetables are grown in the area.

Multistage sampling procedure was used in selecting cassava farmers for the study area. The first stage involved purposive selection of four Local Government Areas (LGAs). The LGAs include Ife East, Ife Central, Ife North and Ife south LGAs. The selection was based on the predominance of cassava farmers in the LGAs. The second stage involved a simple random selection of five villages from each LGA. In the third stage, there was also simple random selection of five cassava farmers that are members of social groups such as farmers 'groups, religious associations, traders' groups, cooperatives, NGO groups, village associations, ethnic groups, self-help groups among others from each village. In all, a total of 100 respondents were interviewed.

Data were analysed using descriptive statistics, social capital indices, budgetary analysis and multiple regression model. Descriptive statistics such as mean, and percentage was used to describe the socioeconomic characteristics of the respondents in the study area.

Social capital indices - The different social capital dimensions were constructed using social capital indices following Balogun *et al.* (2011), Adepoju and Oni, (2012), Iyanda (2015), Balogun *et al.* (2017)

Cash contribution index - This is the amount paid as membership due per annum in a social group. The summation of total cash such as payment of membership dues and other dues contributed to the various social groups, which the farmers belong was calculated. The actual contribution for each household was rescaled by dividing the amount by the maximum amount in the data.

Labour contribution index - This is represented by the number of days that farmers have worked for their various groups per year.

Decision making index - This is the summation of respondents' participation in the decision making of the three most important groups to them. The farmers were asked to evaluate their contribution to decision making process of the group subjectively. Whether it is very active, active, passive, and very passive. This response was scaled from 3 to 0 respectively and averaged across the three most important groups for each farmer. An average of the rank for the three groups was calculated.

Heterogeneity index - This was rated according to twelve criteria such as neighborhood, kin group, occupation, economic status, religion, political affiliation, sex, age group, level of education, cultural practices, belief and trust, following Balogun *et al.* (2011). For each response, A yes was coded as 1, while a no was coded as 0. A maximum score of 12 was allotted for each group to represents the highest level of heterogeneity.

Membership density index - This is measured by the number of active farmers' membership in existing groups. The proportion of membership of group by individual was found by dividing the total number of groups to which each farmer belongs by the total number of groups available in the study area.

Meeting attendance index - The index was obtained by summing up attendance of household members at meetings and divide by the number scheduled meeting per year.

Aggregate social capital index - This is the multiplicative social capital index. The index was calculated using the products of all the dimensions of social capital available to the cassava farmers in their various social groups in the study area.

Budgetary technique - The evaluation of the cost and returns associated with cassava production was analysed using the budgeting technique.
The formula is given as,
$$GM_i = \sum P_i Y_i - C_i \ldots\ldots\ldots (1)$$
GMi = Gross margin of farm I; Pi = Farm gate price per tonnes of cassava of farm I; Yi = Total quantity in kg of cassava of farm I; Ci = Total variable costs incurred on farm I; i…n = Total number of cassava farms
Subsequently, a net return was obtained from gross margin.
Net returns = GM – TF ……. (2)
TFC = Total Fixed Cost

Profitability and efficiency ratio; the following ratios were computed to ascertain the extent of profitability of cassava enterprise namely,
i. Operating expense ratio = TVC/ GR….(3)
ii. Return per Naira outlay = NI/TC…….(4)
iii. Benefit Cost Ratio (BCR) = TR/TC ….(5)
iv. Labour Efficiency measure = TR/LC…(6)
Where,
GR is Gross Revenue; NI is Net Income; TC is Total Cost.

Ordinary Least Square model
Ordinary Least Square model was used to analyse the effect of social capital dimensions on output and gross margin of cassava farmers in the study area.
Output model
The model is implicitly expressed as;
$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 \ldots \beta_{12} X_{12} \ldots\ldots\ldots (7)$$
Y= output

The explanatory variables are: X_1= age of respondent (years); X_2= years of formal education; X_3= farm size (hectare); X_4= farming experience (years); X_5= household size (number of person); X_6= marital status (1= married; 0=otherwise); X_7= membership index; X_8= meeting index; X_9= cash

contribution index; X_{10}= heterogeneity index; X_{11}= decision making index; X_{12}= labour contribution index; Ui= error term

Gross margin model

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 \ldots \beta_{12} X_{12} \ldots\ldots (8)$$

Y= gross margin

The explanatory variables are: X_1= age of respondent (years); X_2= years of formal education; X_3= farm size (hectare); X_4= farming experience (years); X_5= household size (number of person); X_6= marital status (1= married; 0=otherwise); X_7= membership index; X_8= meeting index; X_9= cash contribution index; X_{10}= heterogeneity index; X_{11}= decision making index; X_{12}= labour contribution index; Ui= error term

RESULTS AND DISCUSSION
Socioeconomic characteristics

The socioeconomic characteristics of the respondents were presented in Table 1. The average age of cassava farmers in the study area was 47.59 ± 7.61 years. This implies that young and vibrant people are still involved in cassava production in the study area. About 81% of respondents were married. This could serve as a good source of labour to assist in the farming operation thereby reducing cost of hiring labour. On the average, the household size in the study area was 7.83 ±3.15 persons and years of farming experience was 14.37 ±7.48. The household is relatively large which could also indicate a large supply of labour to the family enterprise and they also have many years of farming experience. About 88% of the respondents had formal education in the study area. This implies that literacy level of the sampled farmers is relatively high. The average farm size was 5.01 ±3.20 ha. This implies that that cassava production in the study area takes place on smallholdings. About 91% of them were males. This implies that male farmers were more active and involved in cassava production activities in the study area.

Table 1: Socioeconomic characteristics of cassava farmers

Variables	Data
Age (years)	47.59(±7.61)
Male (%)	91
Married (%)	81
Formal education (%)	88
Household size (#)	7.83 (±3.15)
Farm size (ha)	5.01(±3.20)
Years of farming experience	14.37(±7.48)

Source: Field Survey, 2018

Dimension of social capital

Six dimensions of social capital among the cassava farmers in the study area were identified. The summary statistics for each of these forms was presented in Table 2. Density of Membership (0.742) was high. This means that the proportion of cassava farmers' membership in associations is 7 out of 10 associations. Degree of Heterogeneity (0.524) was low in the study area. This suggests homogenous characteristics such as same ethnicity, same occupation, same religion and same neighbourhood among the cassava farmers. Decision-Making (0.721) was high in the study area. This implies that cassava farmers are actively involved in decision making in the social groups they belong. The Meeting Attendance (0.697) in the study area was high. This implies that cassava farmers attend the statutory meetings. Cash Contribution value was 0.525 which is relatively low. This implies that the cash commitment to associations by the cassava farmers is low. Labour Contribution (0.656) was high. This shows that cassava farmers are still committed to contributing labour to the social group where they belong. The aggregate social capital was 0.659. The result shows that high level of social capital existed among cassava farmers in the study area. This would improve the economic gains of the cassava farmers in the social groups to boost their output and gross margin. This result compares favourably with Ajani and Tijani (2009) and Iyanda (2015).

Costs and returns of cassava farmers

Table 3 reveals the profit margin of cassava farmers in the study area. The estimated costs and returns of cassava farmers per hectare of land on the average in the study area were ₦153,577.60 and ₦296,421.53 per annum respectively. Among the cost components, cost of labour had the largest share of the total cost (47.04%), followed by cost of fertiliser (8.54%), cost of herbicide or pesticide (6.18%), cost of planting (5.25%), cost fertiliser application (4.84%), cost of weeding (3.97%), cost of transportation (3.23%), and least of it was the cost of cassava plant stem which constitutes (0.29%). Whereas the total revenue on the average was ₦450,000, while the gross margin and net income or returns to management were ₦328,151.30 and ₦295,760.93, respectively.

Table 2: Forms of social capital available to cassava farmers

Variables	Mean	Standard deviation	Min	Max
Cash contribution	0.525	0.347	0.1	1
Labour contribution	0.656	0.350	0.133	1
Decision making	0.721	0.571	0.111	1
Heterogeneity	0.524	0.272	0.167	1
Density of membership	0.742	0.425	0.181	1
Meeting attendance	0.697	0.425	0.125	1
Aggregate Social capital (Multiplicative)	0.659	0.449	0.121	0.954

Source: Field survey, 2018

The return per naira outlay was ₦2.147. This implies that for every ₦1 invested in cassava enterprise, there is a return of ₦2.147 to the enterprise and the operating cash expenses ratio was 27%, which connotes that 27% of the total revenue was used to cover the operating expenses. The benefit cost ratio and labour efficiency analysis were 2.930 and 6.230, respectively. This implies that ₦1 spent on cost yielded ₦2.930 return to the

farmer and output earning per ₦1 expenditure on labour was ₦6.230 showing that labour was well managed. These measures of performance indicate that cassava production in the study area is viable and the business of cassava production is profitable. This result agrees with Itam *et al.* (2014).

Table 3: Average costs and returns (₦) to cassava farmers in the study area for 2017/2018 cropping season of a hectare of cassava farm

Item	Mean Value	% of total cost
REVENUE		
Cassava output	25tonnes	
Price per(tonne)	₦18,000	
Total revenue (TR)	₦450,000	
VARIABLE COST		
Labour cost	₦72233.33	47.04
Planting cost	₦8057.58	5.25
Weeding cost	₦6102.02	3.97
Fertiliser application	₦7438.89	4.84
Cassava planting stem cost	₦450.50	0.29
Transportation cost	₦4957.00	3.23
Fertiliser cost	₦13117.64	8.54
Pesticide/herbicide cost	₦9491.83	6.18
Gross margin (GM) = TR-TVC	₦328151.30	
FIXED COST		
Rent on land	₦21417.23	13.94
Depreciation cost on implement	₦10312.64	6.72
Total Fixed Cost (TFC)	₦31729.87	20.66
Total cost (TC)	₦153578.13	
Net Income (NI) = (GM-TFC)	₦296421.53	
Tax paid	₦660.60	
Net income less tax	₦295760.93	
Return per naira outlay (N) NI/TC		2.147
Operating expense ratio= TVC/TR		0.270
Labour efficiency = TR/labour cost		6.230
Benefit Cost ratio (BCR) = TR/TC		2.930

Source: Field survey, 2018

Effect of social capital dimensions on output of cassava farmers

The R-Square was 0.694. This suggests that 69.4% of the variability in the cassava output of the respondents is jointly explained by variations

in the specified independent variables considered in the model. The model was statistically significant at 1 percent level. Table 4 revealed that age, farm size, decision making index and labour contribution index were significant factors affecting the output

of cassava farmers. Age of farmers was positive and significant; this implies that a unit increase in age of farmers increased cassava output by 5.747units. Farm size was positive and significant; this implies that a unit increase in farm size increased cassava output by 0.463 units. The results agree with Itam *et al*. (2014) and Balogun *et al*. (2018). Decision making index was positive and significant; this implies that a unit increase in decision making index increased cassava output by 0.590 units. This result agrees with Balogun *et al*. (2018). Labour contribution index was positive and significant; this implies that a unit increase in labour contribution index increased cassava output by 0.021 units. This result agrees with Iyanda *et al*. (2014) and Balogun *et al*. (2017).

Table 4: Effect of social capital dimensions on output of cassava farmers

Variables	Coefficient	t- statistics
Age	5.747***	3.23
Marital status	-4.137	0.910
Household size	7.967	0.160
Years of Farm experience	-3.456	-0.120
Years of Education	4.274	0.170
Farm size	0.463**	2.600
Density of membership	0.001	0.500
Cash contribution index	-0.148	0.100
Meeting index	-0.967	-0.240
Heterogeneity index	0.017	0.070
Decision making index	0.590**	2.380
Labour contribution index	0.021***	2.570
R-square	0.694	
Adjusted R-Square	0.610	
Number of observations	100	
Prob > F	0.000	

Source: Field survey, 2018. Note ***, **, * t-values significant at 1%, 5%, 10% respectively

Effect of social capital dimensions on gross margin of cassava farmers

The R-Square was 0.754. This suggests that 75.4% of the variability in the gross margin of cassava farmers is jointly explained by variations in the specified independent variables considered in the model. The model was statistically significant at 1 percent level. Table 5 revealed that marital status, years of education, farm size, membership index, meeting index and decision-making index were significant factors affecting the gross margin of cassava farmers. Marital status was positive and significant; this implies that a unit increase in marital status increased gross margin of cassava farmers by 0.039 units. Years of formal education was positive and significant; this implies that a unit increase in years of formal education increased gross margin of cassava farmers by 0.372 units. The results agree with Oni (2016). Farm size was negative and significant; this implies that a unit increase in farm size decreased gross margin of cassava farmers by 0.572 units. Membership density index was positive and significant; this implies that a unit increase in membership density index increased gross margin of cassava famers by 0.448 units. The result agrees with Durojaiye *et al*. (2013) that additional membership in associations improve profitability. Meeting index was positive and significant; this implies that a unit increase in meeting index increased gross margin of cassava farmers by 0.530 units. The result agrees with Kehinde (2019). Decision making index was positive and significant; this implies that a unit increase in decision making index increased gross margin of cassava farmers by 0.450 units. The result disagrees with Durojaiye *et al.* (2013) that active participation in decision making reduces profitability.

Table 5: Effect of social capital dimensions on gross margin of cassava enterprise

Variables	Coefficient	T- statistics
Age	0.001	0.020
Marital status	0.039*	1.890
Household size	0.429	1.390
Years of Farm experience	0.002	1.250
Years of Education	0.372**	2.184
Farm size	-0.572**	-2.244
Density of membership	0.448**	2.210
Cash contribution index	-0.769	-0.240
Meeting index	0.530**	2.130
Heterogeneity index	0.919	0.178
Decision making index	0.450**	2.497
Labour contribution index	0.662	1.310
R-square	0.754	
Adjusted R-Square	0.710	
Number of observations	100	
Prob > F	0.000	

Source: Field survey, 2018 Note, ***, **, * t-values significant at 1%, 5%, 10% respectively

CONCLUSION

The study concluded that majority of the cassava farmers were male, small scale and at their productive age. Cassava production in the study area is viable and the business of cassava production is profitable. Social capital is an important variable affecting output and gross margin of cassava farmers. Following the findings of the study, farmers should be encouraged to join social groups to be able to improve their cassava production. Also, farmers should participate more actively in group activities as effective participation in association's decision making facilitates access to productive resources such as credit, labour among others.

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ASSESSMENT OF YOUTH PARTICIPATION ALONG FISH VALUE CHAIN ACTIVITIES IN EDE NORTH LOCAL GOVERNMENT, OSUN STATE, NIGERIA

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ABSTRACT
The study assessed youth participation in fish production value chain in Ede North Local Government, Osun State, Nigeria. The study specifically described the socioeconomic characteristics of youths involved in fish production value chain in the study area, examined their perception, determined their level of participation and identified the constraints affecting their participation in fish production value chain. Multistage sampling procedure was used to select one hundred respondents from the study area. Results showed that majority, (56.0%) of the respondents were below 40 years of age and 73.0% were males. Majority, (69.0%) had travelled out of outside the State. Fish production value chain activities is a way to reduce poverty (79.0%) ranked highest among the indicators of perception of youth about fish production value chain activities followed by fish production value chain activities are capital intensive (72.0%). In addition, wholesaling ($\bar{x}$ =2.72) ranked the highest among the fish value chain activities the youths participated in followed by feeding of fish ($\bar{x}$ = 2.68). Also, some of the youths (22.0%) indicated that lack of credit facilities as a constraint affecting their participation in fish production value chain activities followed by instability of economy (17.0%). There was a positive and significant relationship (p≤ 0.001, r=0.265) between perception of youth and their participation in fish production value chain activities. The study concluded that the level of youth participation in fish production value chain was moderate and recommended that micro credit facilities with low interest rate and low collateral demands suitable for youth participation in fish production value chain be made available.
Keywords: Assessment, Youth, Participation, Fish, Value Chain Activities

INTRODUCTION

Fish is an important source of animal protein for both man and livestock in developed and developing economies. In Nigeria, the current demand for fish is about four times the level of local production. Humans consume approximately 80 percent of the catch as food. The remaining 20 percent goes into the manufacturing of products such as fish oil, fertilisers, and animal food (Emmanuel, Chinenye. and Peter 2014).

Adelodun, Bankole, Rafiu, Morawo and Ajao (2016) posited that aquaculture in Nigeria still requires some physical strength which the already ageing farmers do not poses. Norton (2014) reiterated that value chain is a set of linked activities that work to add value to a product, which consist of actors and actions that improve a product while linking commodity producers to processors and market.

Fisheries and aquaculture are integral parts of agriculture which were found to have the capacity to increase the country's GDP and can solve the unemployment problem for our teeming youths if adequately managed. The formal sector of employment where most graduates seek employment cannot absorb the large number of graduates, estimated to be between 10-12 million young persons per year (Alliance for Green Revolution in Africa (AGRA, 2015).

According to Nwunel (2018), the average age of Nigeria farmers is between 55-60 years and the participation of Nigeria farmers in agriculture is low let alone the value chain of the sector. Participation of youths in agriculture is a way of increasing their skills, knowledge, confidence, self-reliance and opportunity to collaborate and engage in sustainable development. Fasina (2013) also posited that the Nigerian farmer is ageing with an average age of 50 years.

Adelodun et al., (2016) reiterated that youth amounts to about 80 million, representing about 60.0% of the total population of the country. This shows that the youth dominates the country in terms of population, but the apathy of the youths towards fish farming has limited their participation in the sector. Presently, it has been observed that the number of youth involved in aquaculture is very small, rather than getting involved in farming activities, a vast population of the youth goes in search of the white collar jobs which a decline in its availability has been the experience in recent times. For aquaculture to reach its full potential there should be a considerable and active participation of a high percentage of the youth in the sector (Adelodun et al., 2016). Hence, this study assessed youths' participation in Fish Production Value Chain (FPVC) activities in Ede North Local Government Area, Osun State, Nigeria.

The general objective of the study was to assess the participation of youths along FPVC activities in Ede North Local Government Area, Osun State, Nigeria. Specific objectives were to:
i. describe the socioeconomic characteristics of youths involved in FPVC activities in the study area;
ii. examine the perception of the youths about the FPVC activities;
iii. determine the extent of participation of the youths in FPVC activities and;

iv. identify the constraints affecting the participation of the youths involved in FPVC activities.

The study hypothesized that there is no significant relationship between the youths' perception towards FPVC activities and their extent of participation in the FPVC activities.

METHODOLOGY

The study was conducted in Ede North Local Government Area, Osun State, with headquarters at Oja Timi in the town of Ede. The study area has a population of 83,818, with 42,282 males and 41,536 females (National Bureau of Statistics, 2018). The population of the study comprised youths only (aged between 15 years to 40 years) who were participating in FPVC activities. Ede North Local Government Area was purposefully selected for the study due to the encouraging population of fish producers available. Multistage sampling procedure was used for the sample selection. In the first stage, random sampling technique was used to select five communities namely: Apaso, Adejumo, Araromi, Atoyebi and Sabo. At the final stage 100 youths who participated in FPVC were equally drawn from the five selected communities.

The Agricultural Development Programme staff member in the area assisted in contacting the respondents. The data for the study was collected using a well-structured and validated interview schedule. Data collected were summarized using descriptive statistics such as frequency counts, percentages, mean and standard deviation. In addition, correlation analysis was used to determine the relationship between the dependent and an independent variable of the study. The extent of participation was measured on a four-point Likert-type scale of 0, 1, 2 and 3 for not at all, rarely, occasionally and often respectively for the extent of participation. Perceptional statements were used to measure perception on a five-point likert-type scale of 0, 1, 2, 3, and 4 for strongly disagree, disagree, undecided, agree and strongly agree respectively for the positive perceptional statements and the inverse for negative perceptional statements.

RESULTS AND DISCUSSIONS
Personal and socioeconomic characteristics

Results in Table 1 show that the mean age of respondents was 30.78 ±7.42 years. This indicated that respondents were in their productive ages and they were very active. This result agrees with the position of Uzoma, Bello and Falade (2017) that Sub-Saharan Africa that youths are people within the age bracket of 15 and 35 years. Majority, (73.0%) of the respondents were male. This indicated that FPVC activities is male dominated. This finding is similar to that of Idrisa,

Shehu, and Ngamdu (2012) who stated that the majority (87.7%) of the respondents were male respondents.

The results also show that close to half, (47.0%) of the respondents were married. This implied that almost half of the respondents have partners who can help in decision making. This finding is similar to that of Umar, Musa, and Kamsang (2014) who found that majority of the farmers were married. The results further show that majority, (69.0%) had travelled outside the state in the last one year. This indicated that the respondents had high level of cosmo-politeness exposure in improving their FPVC activities.

The results show further respondents used imported equipment (6.0%), fairly used equipment (36.0%) and locally fabricated equipment (58.0%). This indicated that locally fabricated equipment were the most assessable in the study area. The results also show that majority, (73.0%) of the respondents got their capital through personal savings, few, (16.0%) got their own through relatives, and (2.0%) got theirs through government, (2.0%) got theirs through credit institutions and (7.0%) got theirs through cooperatives. This implied that the youths that participated in FPVC activities in the study area depended on themselves and their relatives for acquiring capital that would assist them in their FPVC activities.

Perception of the youths towards FPVC activities

The perception of the youths about FPVC activities may have an influence on their participation in it. Results in Table 2 reveal that majority (79.0%) of the respondents strongly agreed that FPVC activities are a way to reduce poverty. FPVC activities can solve the problem of food shortage (70.0%), FPVC activities can reduce the rate of unemployment (57.0%), and FPVC is a lucrative business (54.0%). These perceptions may encourage the respondents to participate in FPVC activities if they are sure that engaging in it will alleviate their poverty, make them food secured, cash secured and gainfully engaged. In addition, majority of the respondents strongly agreed that FPVC activities will increase agricultural productivity (69.0%) and a little above average (51.0%) agreed that FPVC strengthen the link between agricultural stakeholders. These perceptions are expected because FPVC activities are chiefly agricultural and participating in them will further increase agricultural activities and strengthen the link between agricultural stakeholders.

However, (72.0%) of the respondents strongly agreed that FPVC activities FPVC activities are capital intensive. This perception may discourage the respondents from participating in FPVC activities. This finding agrees with the

findings of Adelodun *et al.,* (2016) that youths perceive aquaculture as a high capital investment and most of them have limited funds/income to carry out that kind of investment.

Table 1: Distribution of respondents based on their personal and socioeconomic characteristics (n=100)

Variables	Freq	Percent	x̄	S.D
Age				
≤20	16	16.0		
21.00-30.00	65	65.0		
31.00—40.00	19	19.0	30.78	7.42
Sex				
Male	73	73.0		
Female	27	27.0		
Marital status				
Single	41	41.0		
Married	47	47.0		
Divorced	10	10.0		
Widowed	2	2.0		
Cosmopoliteness				
Not at all	6	6.0		
Neighboring local government	15	15.0		
Other state within Nigeria	69	69.0		
Outside Nigeria	10	10.0		
Type of equipment				
Imported	6	6.0		
Fairly used	36	36.0		
Locally fabricated	58	58.0		
Capital				
Personal savings	73	73.0		
Relatives	16	16.0		
Government	2	2.0		
Credit institution	2	2.0		
Cooperative	7	7.0		

Source: Field survey, 2018

Table 2: Perception of youths towards FPVC activities (n=100)

Variables	SA	A	U	D	SD
FPVC is a way to reduce poverty	79.0	21.0	0.0	0.0	0.0
FPVC is capital intensive	72.0	25.0	2.0	1.0	0.0
FPVC can solve the problem of food shortage	70.0	26.0	4.0	0.0	0.0
Youths' participation in FPVC will increase agricultural productivity	69.0	25.0	3.0	0.0	3.0
FPVC can help reduce the rate of unemployment	57.0	39.0	1.0	0.0	2.0
FPVC is a lucrative business	54.0	33.0	3.0	0.0	3.0
FPVC strengthen the link between agricultural stakeholders	41.0	51.0	3.0	2.0	4.0
There is no steady employment in FPVC	26.0	11.0	12.0	31.0	20.0
FPVC activities are concentrated in agrarian communities	19.0	15.0	11.0	30.0	25.0
FPVC activities do not benefit youths	20.0	8.0	18.0	36.0	18.0
FPVC activities cannot increase the standard of living of stakeholders	10.0	2.0	13.0	58.0	17.0

Source: Field survey, 2018

Extent of participation in FPVC activities

Results in Table 3 reveal that wholesaling (x̄=2.72) ranked the highest among the FPVC activities the youth participated in, followed by feeding of fish (x̄=2.68), weighing of fish (x̄=2.55), stocking (x̄=2.52), selection of fish (x̄=2.51), treating of fish (x̄=2.50), handling of fish (x̄=2.48) and others in that order. These results further implied that most of the respondents participated in FPVC activities for economic and food security/sufficiency and socio reasons; that is to have money in their pockets, to have food on their tables and to get engaged in FPVC activities as an occupation whether on full time or part time basis.

Table 3: Extent of youths' participation in pre-production, production, processing or value addition and marketing activities (n=100)

Variables	Not at all	Rarely	Occasionally	Often	x̄
Pre-production activities					
Selection of fish	4.0	5.0	27.0	64.0	2.51
Construction of pond	3.0	12.0	28.0	57.0	2.39
Purchasing of input	4.0	11.0	30.0	55.0	2.36
Sourcing of labour	5.0	17.0	30.0	48.0	2.21
Sourcing for capital	2.0	18.0	45.0	35.0	2.13
Demudding of pond	5.0	23.0	31.0	47.0	2.08
Formulation of feed	4.0	30.0	39.0	27.0	1.89
Production activities					
Feeding of fish	1.0	6.0	17.0	76.0	2.68
Stocking	3.0	5.0	29.0	63.0	2.52
Treating of fish	2.0	8.0	28.0	62.0	2.50
Weeding of pond	2.0	11.0	22.0	60.0	2.45
Manual harvesting	3.0	13.0	27.0	57.0	2.38
Processing or value addition activities					
Weighing of Fish	2.0	10.0	19.0	69.0	2.55
Handling of fish	0.0	8.0	36.0	56.0	2.48
Smoking of fish	1.0	8.0	45.0	46.0	2.36
Salting of fish	4.0	12.0	40.0	44.0	2.24
Drying of fish	3.0	17.0	47.0	33.0	2.10
Storage of fish	6.0	36.0	29.0	29.0	1.81
Bagging of fish	9.0	33,0	27.0	31.0	1.80
Canning of fish	16.00	44.0	18.0	22.0	1.46
Marketing activities					
Wholesaling	0.0	4.0	20.0	76.0	2.72
Retailing	2.0	11.0	40.0	47.0	2.32
Exporting	43.0	28.0	13.0	16.0	1.02

Source: Field survey, 2018

Constraints affecting youths' participation in FPVC activities

Results in Table 4 show that lack of credit facilities (22.0%) ranked highest among the constraints affecting youth participation in fish value chain activities. Also, instability of economy (17.0%). high cost of inputs (16.0%), illiteracy (15.0%), lack of storage facilities (10.0%). poor land tenure system (7.0%), high cost of labour (6.0%), low level of external orientation (3.0%), lack of appropriate technology (3.0%) and poor transport amenities (1.0%) followed as other constraints in that order. This finding agrees with that of Adelodun *et al.,* (2016) which revealed lack of credit facilities as one of the major constraints hindering the participation of youths in fish production in the study area.

Table 4: Constraints affecting youths' participation in FPVC activities (n=100)

Constraints	Freq	Percent
Lack of credit facilities	22	22.0
Instability of the economy	17	17.0
High cost of inputs	16	16.0
Illiteracy	15	15.0
Lack of storage facilities	10	10.0
Poor land tenure system	7	7.0
High cost of labour	6	6.0
Low level of external orientation	3	3.0
Lack of appropriate technology	3	3.0
Poor transport facilities	1	1.0

Source: Field survey, 2018

Test of hypothesis

Results in Table 5 show the correlation analysis between the respondents' perception of FPVC activities and their participation in FPVC activities. The results show that the respondents' perception towards FPVC activities correlated positively and significantly with their participation in FPVC activities (r= 0.265; p=0.008). We therefore reject the null hypothesis and indicate that there is a statistically significant relationship since the respondents' perception of FPVC activities influences their participation in FPVC activities in the study area.

Table 5: PPM Correlation showing relationship between the respondents' perception of FPVC activities and extent of participation in the FPVC activities

Variables	Correlation coefficient (r)	p-value	Decision
Perception	0.265**	0.008	S

** Significant at P≤ 0.01
Source: Field survey, 2018

CONCLUSION AND RECOMMENDATION

The study assessed youth participation in fish production value chain in Ede North Local Government, Osun State, Nigeria. The study revealed that majority of the respondents were in their productive ages and they were very active, were males and had travelled out of outside the State. The respondents still believe that fish production value chain activities is a way to reduce poverty and that fish production value chain activities are capital intensive. Most of the respondents participated in wholesaling and feeding of fish. Also, some of the youths indicated that lack of credit facilities and instability of economy as a constraint affecting their participation in fish production value chain activities. In order to improve the participation of youth in the FPVC activities, the study recommended that the government and private organisations make micro credit facilities with low interest rate and low collateral demands suitable for youth participation in fish production value chain available.

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CONSTRAINTS TO MICROFINANCE BANKS' SERVICES AMONG RURAL DWELLERS IN OYO WEST LOCAL GOVERNMENT AREA OF OYO STATE, NIGERIA

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ABSTRACT

Over the years, rural dwellers' access to finance through several rural finance and development programs met with unsatisfactory results due to one constraint or the other, hence poverty is still prevalent among rural dwellers. This study therefore probed factors associated with rural dwellers' benefits derived from microfinance bank's services in Oyo West Local Government Area of Oyo state. Multistage sampling procedure was used to select 105 respondents, interview schedule was used to elicit information on personal characteristics, sources of information, rural dwellers' participation, benefit derived from microfinance banking and constraints faced by rural dwellers in getting microfinance banks' services. Majority (51.4%) of the respondents were between age bracket 40-59 years, male (53.3%) and 46.7% were farmers. They heard about microfinance bank from friends (89.5%) and radio (83.8%) while they participated most in savings plan (61.9%) and business loan (57.1%). They ranked opening of account with very little fund as most important benefit derived with weighted mean score of (132.3). They had low (55.2%) level of benefits while constraints to microfinance banks' services were high interest rate (119.1), short repayment time (116.3) and inadequate fund to save before obtaining loan (113.9) respectively. Although rural dwellers benefited from microfinance banks, amount was generally low due to high interest rate and short repayment time. Therefore, interest rate should be reduced to the minimum level, while grace period for repayment is increased at least to one production year in order to lessen the rural dwellers' rigors of access funds to improve their livelihood.

Keywords: Microfinance bank, Rural poverty, Business loan, Interest rate and Rural dwellers.

INTRODUCTION

Rural communities in Africa are characterized by poverty and low income as a result of low industrial activities. The major preoccupation in such communities is agricultural production, mostly with traditional implements and tools (FAO, 2016). According to World Bank (2016) 60% - 85% of rural populace is living below the poverty line, showing that incidences of poverty are pronounced in the rural than the urban areas. Even, its prevalence in the developing countries has been extremely high such that poverty eradication has become a big issue to tackle.

Poverty is a concept that entails socioeconomics and political deprivation which may affect individual, household or communities and which may result in lack of accesses to the basic necessities of life. World Bank report (1990) as cited in Ogunleye, (2010) defined poverty as hunger, lack of shelter, being sick, not being able to go to school, not knowing how to read, not being able to speak properly, not being able to get a job, and having fear for the future, losing a child to illness brought about by unclean water, powerlessness, lack of representation and freedom. Meanwhile, poverty reduction has been receiving increasing global focus because research findings have shown that significant poverty reductions are possible and have indeed occurred in many developing countries. This can be achieved according to Learning to Compete, (2016) if the apex bank can institute appropriate measures to improve the value of the Naira so as to boost the nation's economic restructuring program, create new enterprises and employment and a minimal level of social safety nets be established before selling off state-owned corporations. One of such measures that emerged as an effective strategy for poverty alleviation is microfinance scheme. According to Onwuka, and Udeh, (2015) Nigerian government conceived the idea of microfinance banks to fill the gaps created by the collateral-based conventional banks that are reluctant or ill-equipped to meet the special credit needs of the rural people who are mostly illiterate farmers and petty traders.

Microfinance is defined as the provision of financial services such as credits services (loans), savings, micro-leasing, insurance on credits and payment transfers to economically active poor and low income households to enable them engage in income generating activities or expand/grow the small businesses (Ashamu and Ogundina, 2015). Microfinance refers to financial services provided to low income people, usually to help support self-employment. Some of the microfinance services provided include small loans, saving plans, insurance, payment transfers and other services that are provided in small increments that low income individuals can afford. According to Khanam, Mohiuddin, Hoque and Weber, (2018) these services help families to start to build "micro enterprises", a small businesses that are important sources of employment, income and economic vitality for the poor families and low-income groups in developing countries. However, before the advent of microfinance banks, rural dwellers have been accessing fund from informal sector through sundry contributory schemes like

ESUSU (Yoruba), ETOTO (Igbo) and ADASHI (Hausa) which operates in all the rural areas in Nigeria. These schemes work on the principle of "large numbers" where the contributions of the participants form a pool that provides beneficiaries with funds used to execute various economic activities. Some of the schemes' features include flexible savings and credit, components informality of operations and friendly interest rates while microfinance emerged just to apply sound economic principles in the provision of financial services to low income people, (Igangia, 2008). According to CBN, (2005) as cited by Onwuka, and Udeh, (2015) microfinance banking system was institutionalized by Revised Microfinance Banking Act of 2005. This is with the primary aim of promoting grassroots self-reliant economic development through the provision of finance and other banking services at the local level. Microfinance banks were established to address some of the identified constraints that limit a lot of low-income Nigerians access to bank credit, to ensure geographical accessibility of banking facilities in the rural communities and the unbanked poor urban dwellers (Okezie, Bankoli and Ebomuche, 2013).

The fact that microfinance intervention was born to ease the suffering caused by poverty and to awaken the global economy of the world's working poor, cannot be overemphasized. The scheme was introduced after the different efforts put in place by successive governments to solve the problem through several rural finance and development programs met with unsatisfactory results. This, probably was due to the lack of mechanism, which would encourage the mobilization of savings among people at the grassroots and at the same time simplify the disbursement of funds through loan and advances. To complement government's efforts, a lot of NGOs and Universal Banks were also encouraged to engage in microfinance services because perhaps the scheme can take the nation to the promise land. Despite the promises of the intervention and immense benefits to help those who do not have collaterals demanded by the commercial banks, to alleviate poverty and awaken the global economy of a nation, one would expect a significant reduction in poverty level among the low –income group in the country. The fact that poverty is still prevalent among the rural dwellers is an indication that that the execution of the scheme is faulty and requires that one finds out constraints to microfinance bank's services. It is against this backdrop that, this study assessed the constraints to microfinance banks' services among rural dwellers in Oyo West Local Government Area of Oyo state. The objectives below guided the study:

1. to describe the personal characteristics of rural dweller.
2. to identify rural dwellers' sources of information about microfinance bank services.
3. to determine which of the microfinance services do rural dwellers participate most.
4. to ascertain the extent to which respondents derived benefits from microfinance bank's services.

METHODOLOGY

The study was conducted in Oyo West Local Government Area (LGA) of Oyo state. Multistage sampling procedure was employed in selecting rural dwellers who patronize one microfinance bank or the other for the study. The first stage involved stratification of wards in Oyo West local government area into rural and semi-rural wards using stratified sampling technique. This gave a total of 10 wards in rural stratum. So in the second stage 50 percent of wards that fall into rural stratum was selected to have 5 wards. In these selected wards there are 22 villages in all. The third stage involved selection of 25 percent (5.5 villages) of villages in the selected wards using simple random sampling technique. This gave an approximation of six villages. In the final stage, 25 rural dwellers (who patronize one microfinance bank or the other) were selected from each villages to give a total of one hundred and fifty respondents. However, 105 questionnaires were recovered and used for analysis of this study. Data were collected on rural dwellers' personal characteristics, participation, benefits derived and factors associated with benefits they derived using structured questionnaire but administered as interview schedule. These were analysed using frequency and percentage, mean, weighted mean score and rank orders statistical tool

Rural dwellers' participation in microfinance bank's services was measured through eight services that could be rendered by microfinance banks such as savings plans, insurance, payment transfer, small loans, business loans and so on. Dichotomous response option of "Participate" and "Not participate" were provided. A score of one was assigned to "Participate" and 0 was assigned to "Not participate". Thereafter, mean score was determined for each service to identify the most participated service by the respondents. To measure respondents' sources of information about microfinance banks, a list of 10 sources of information like radio, television and newspapers were provided with dichotomous response options of "Yes" and "No". "Yes response option was assigned 1 score, while "No" was assigned a score of 0. Furthermore, level of benefits derived from microfinance bank's services was measured in two stages. First, they were asked to state the extent to which they derive benefits from services of microfinance bank. They were provided with three

response options of "To a large extent", "To a lesser extent" and "Not at all" while a score of 2, 1, and 0 was assigned to respectively. Thereafter, weighted mean score was computed and was used to rank the benefits derived. In the second stage, the level of benefit derived was determined by computing benefit index for each respondent, and mean was used as a bench mark to categorise level of benefits to high and low. The index range was 2-12 with a mean score of 6. Scores below the mean value were regarded as low level of benefit derived while mean and above the mean value was categorised as high level of benefit derived.

Meanwhile, constraints to microfinance bank's services was measured by providing respondents with a set of 19 factors or constraints that could affect or limit the benefits derived from microfinance bank's services. Some of these factors are obtaining loan with stress, long maturity period, financial literacy, lack of deposit insurance and delay in disbursement of loan among other factors. Response options provided were; 'Not a factor', 'Minor factor' and 'Major factor' with assignment of scores of 0, 1 and 2 respectively. Weighted score was later determined and used to rank the constraints such that a factor with the highest weighted score wass regarded as a major factor that affected respondents' level of benefits, while the one with the least score is just a minor factor in that other. Finally, rural dwellers' personal characteristics were measured at interval, nominal and ordinal level of measurement as the case dictated.

RESULTS AND DISCUSSION
Personal characteristics of rural dwellers
The result of the analysis as presented in Table 1 shows that 51.4% of the respondents were between the age ranges of 40 to 59 years. This implies that majority of the respondents are neither too young nor too old, they are in their active or productive age which means they should be able to make good use of the loan received from microfinance bank judiciously. This is in tandem with findings of Onwuka and Udeh, (2015) that rural dwellers are in their productive lives and are consequently considered to be active economic actors in the rural economy. Above average were male (53.3%), 71.4% were married, 32.4% had at least primary education while many (46.7%) of them were farmers. The implication is that almost half of the respondents take farming as their main occupation and diversify into other livelihood activities. It could be deduced that microfinance bank disburse loan to people from different occupations. This confirms the position of Bryceson (1996) in Charmaine, (2011) that there is a process of occupational adjustment, income

earning orientation, social identification and spatial relocation of rural dwellers away strictly from peasant mode of livelihood. That majority of the respondents are male may be because women are risk averse and do not want to involve in loan collection due to the fact that they do not have asset that could serve as collateral required for obtaining loan. High percentage of married people among the rural dwellers indicates that they are responsible and may be planning to use loan collected to improve the standard of livings of members of their families. On forms of education, the fact that many of the respondents had primary education is a plus and good one because they will be able to keep proper record of their sales and monitor their loan status. This is in line with Cathy Austin and Nahanga, (2017) opinion that the level of education achieved by the respondents is good enough to aid their propensity to improve their production.

Rural dwellers' sources of information about microfinance banks
Table 2 shows that 89.5% of the respondents heard about microfinance banks from friends and 83.8% heard from radio, while 76.7% heard from neighbours/relations. This implies that friends, radio and neighbours/relations are the most preferred sources of information about microfinance bank among other sources. It could also be said that they heard from friends and neighbours who have benefitted from microfinance bank services, hence they severed as referral. This is in agreement with Yohanna, Ndaghu and Barnabas, (2014) who posited that high preference for friends as a source of information can be attributed to the fact that rural dwellers especially farmers prefer their friends or other farmers' as a first-hand information to the apparent ineffectiveness of public extension services in developing countries. According to NOIPOLLS report (2018) the use of radio as the most popular source of information in Nigeria. The situation remains the same up till now and radio is probably preferred because radio set is cheap to obtain, easy to operate and widely owned among the rural communities. However, it is surprising that just 46.7% heard from microfinance bank marketers who are supposed to be the flag bearer or advocate of the benefits to be derived from banking with them. This is an indication of poor marketing strategy in most of these microfinance banks because it is obvious that the marketers failed to reach out to people in the interior rural areas. How will this set of people benefit, if they were not contacted? You need to appreciate the importance of referral in this respect. Who can be a better marketer than friends/neighbours who have benefitted from the service of a microfinance bank?

Table 1: Distribution of the respondents according to their personal characteristics

Characteristics	Category	Percentage
Age of respondents	20-39	45.7
	40-59	51.4
	60 and above	2.9
	Total	**100**
Forms of education	No formal education	26.7
	Primary education	32.4
	Adult literacy education	9.5
	Tertiary education	31.4
	Total	**100**
Sex	Male	53.3
	Female	46.7
	Total	**100**
Marital status	Single	22.9
	Married	71.4
	Divorced	5.7
	Total	**100**
Main occupation	Farming	46.7
	Trading	33.3
	Clerk/Typist	1.9
	Teaching	3.8
	Farming and trading	12.4
	Teaching and trading	1.9
	Total	**100**

Source: Field survey, 2008.

Table 2 Distribution of rural dwellers on their sources of information about microfinance banks

Sources of information	Frequency	Percentage
Friend(s)	94	89.5
Village head	54	51.4
Radio	88	83.8
Newspaper	49	46.7
Informal meeting	56	53.3
Campaign team	50	47.6
Television	59	56.2
Neighbours/relations	80	76.2
Advertisement	56	53.3
Marketers	47	44.8

*Multiple Response
Source: Field survey, 2008

Rural dwellers' participation in microfinance banking

Table 3 reveals that 61.9% of the rural dwellers participated in savings plans of the services provided by microfinance banks, 57.1% participated in business loans, 53.3% in small loans, 41.0% in individual loans, 21.1% in consumer loans, 16.2% in payment transfer, 12.4% in school fees loans and 5.7% participated in insurance scheme. This indicates that majority of the respondents are patronize banks especially the savings plan and do not keep money at home or in the ground as before. This improvement maybe as a result of benefits derived such as access to loan. Ayuub (2013) posits that loan facility collected through microfinance institution has helped clients to give better education to their children. This is because the income of households increases after taking loans and leads to increase in expenditure on their children education.

Table 3 Distribution of rural dwellers on their participation in microfinance banking

Microfinance bank services	Frequency	Percentage
Savings plans	65	61.9
Insurance	6	5.7
Payment transfer	17	16.2
Small loans	56	53.3
Business loans	60	57.1
School fees loans	13	12.4
Consumer loans	22	21.1
Individual loans	43	41.0

*Multiple Responses
Source: Field survey, 2008

Respondents' level of benefits derived from microfinance bank's services

Table 4 indicates that among other benefits derived from microfinance bank services, rural dwellers ranked opening of account with very little fund first, with weighted mean score of 132.3, followed by obtaining loans without collateral (126.0), improved standard of living (121.9) and obtaining loans with low interest rate (117.3). The implication is that rural dwellers actually benefited from microfinance bank services, which might be one of the reasons they participated (see Table 3) in the first place. However, it is not enough to mention the benefits derived by rural dwellers without stating the level at which they derived such benefits and to this end. Table 4 further shows that more of the respondents (55.2%) had low level of benefits derived from the banks. Therefore, this implies that despite the fact that rural dwellers benefited from microfinance bank services, the level of such benefits was low and this may be as a result of different constraints faced in participating in microfinance bank services. Authorities, (Okezie, Bankoli, and Ebomuche, (2013), Ayuub, (2013) and Bamisele, (2011) ascertained that empirical evidences indicate that the poorest can benefits from microfinance from both an economic and socio wellbeing points of view. This indicates that microfinance can be a more viable strategy for sustainable poverty alleviation by expansion of program outreach and depth.

Table 4 Distribution of respondents according to the level of benefits derived from microfinance bank's services

Benefits derived	To a large extent	To a lesser extent	Not at all	Weighted score	Rank
Opening of account with very little fund	54.5	23.3	22.2	132.3	1st
Obtaining loans without collateral	50.5	25.0	24.6	126.0	2nd
Improved standard of living	52.4	17.1	30.5	121.9	3rd
Obtaining loans with low interest rate	40.1	37.1	27.8	117.3	4th
Having timely capital for my business	41.6	33.5	30.0	116.7	5th
A very good insurance scheme	38.0	37.8	24.2	113.8	6th
Level of benefits	**Frequency**		**Percentage**		
Low (2-5.9)	58		55.2		
High (6-12)	47		44.8		
Total	**105**		**100.0**		

Source: Field survey, 2008

Respondents' constraints encountered in microfinance banks' services

Table 5 shows that high interest rate, short repayment time, inadequate fund to save before obtaining loan, risk aversion and long maturity period were ranked as the most important challenges that the respondents faced in fully benefiting from microfinance bank services with weighted mean scores of 119.1, 116.3, 113.9, 109.6 and 106.1 respectively. This is in accordance with the findings of Ademoh and Zivkovic, (2017) that high interest rates among other factors hindered business owners from accessing loan from Microfinance banks. The implication is that rural dwellers would have benefited more but for the above listed factors that constrained them. According to the findings of this study on Table 4 rural dwellers had low level of benefits derived from microfinance bank services which could be probably because of these identified factors. For example the interest rate of microfinance banks if calculated for the period of re-payment is more than that of conventional banks while grace period or tenor given to agricultural loan is so small to the extent that farmers would not have sold their farm

produce and products before repayment is due

hence increasing stress.

Table 5 Distribution of respondents according to constraints encountered in microfinance banks' services

Identified factors	Not a factor	Minor factor	Major factor	Weighted score	Rank
High interest rate	29.5	21.9	48.6	119.1	1st
Short repayment time	30.5	22.9	46.7	116.3	2nd
Inadequate fund to save before obtaining loan	27.6	30.5	41.7	113.9	3rd
Risk aversive	22.9	44.8	32.4	109.6	4th
Long maturity period	32.4	28.9	38.6	106.1	5th
Obtaining loan involve stress	30.5	33.3	36.2	105.7	6th
Financial literacy	42.9	13.3	43.8	100.9	7th
Lack of deposit insurance	36.2	26.7	37.1	100.9	7th
Delay in disbursement of loan	36.2	33.3	30.5	94.3	9th
Lack of credit facilities	38.1	37.1	24.8	86.7	10th
Poor access to information	38.1	37.1	24.8	86.7	10th
Political instability	52.4	17.1	30.5	78.1	12th
Lack of immutable client's right	48.6	27.4	24.0	75.4	13th
Discrimination	51.4	37.1	11.5	60.1	14th
Cultural constraint	58.1	26.7	15.2	57.1	15th
Exploitation	61.0	23.8	15.2	54.2	16th
Corrupt intermediaries	63.8	26.7	9.6	45.9	17th
Complicated fiscal system	61.9	34.3	3.8	41.9	18th
Absence of rule of law	78.1	8.6	13.3	35.2	19th

Source: Field survey, 2008

CONCLUSION AND RECOMMENDATIONS

Constraints to microfinance banks' services are high interest rate, short repayment time and inadequate fund to save before obtaining loan. Therefore, interest rate of microfinance bank should be addressed and reduced when formulating the next microfinance banking policy so as to really lessen the burden of the rural people. On the other hand, grace period to repay agricultural loan should also be extended at least using the gestation or maturity period of the crop grown or animal reared by the famers as a yardstick.

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EFFECTIVE AGRO-LOGISTICS: PATHWAY TO REDUCE POST HARVEST LOSSES AND IMPROVE HOUSEHOLD AND NATIONAL FOOD SECURITY IN NIGERIA

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ABSTRACT

Preservation of agricultural products has remained a serious challenge over the years, resulting in huge post-harvest losses annually. This position paper, examined various challenges associated with post-harvest losses, factors that contribute to post-harvest losses and its consequences on household and national food security. Using literature and pictures from authors' studies, this paper also identified agro-logistics bottlenecks and different stages at which losses are incurred along agricultural value chain. Lack of storage facilities (especially modern facilities), financial incapability, lack of access to modern drying technology, poor post-harvest handling across the value chain were among the factors that contribute to post-harvest losses. Poor post-harvest logistics and bad road networks most especially in rural areas also contribute to losses of food in the supply chain. Consequently, actors at different stages of agricultural value chain have a share of the losses. As concerted efforts are being directed at increasing food production in the country, adequate attention should be given to effective agro-logistics in the agricultural value chain as well. This will not only ensure getting agricultural products to the right market or consumers, at the right time, in the required quality or specifications, but also, reduce costs along the value chain and increase the revenue of actors in food supply chain, thereby contributing to sustainable food security at household and national levels in the country.

Keywords: Agro-Logistics, Post-Harvest losses, Pathway, Challenges, and Food security.

INTRODUCTION

Nigeria agricultural growth and competitiveness over the years has experienced various institutional and structural bottlenecks. This include poor infrastructure such as roads and electricity supplies, lack of inputs, lack of technical expertise, and inadequate policies and weak institutional support (Guritno, 2017). In the same vein, Bartecchi, (2011) stated that the low standard of living in rural communities depends not only upon the range of foods grown, the capacity to grow in quantity, but also upon the facilities for efficient handling, drying, storage and marketing of farm produce. Consequently, enormous quantities of agricultural produce especially in food supply are lost annually (FAO, 2011) at different stages of post-harvest handling. A major drain on food production and food security in Sub-Sahara Africa is post-harvest losses that occurred at different levels and stages of the value chain (Obayelu, 2014). In addition to the food losses, massive losses are also recorded in terms of wasted arable land and water resources, labour, fertiliser and other inputs as well as money that went into food production (Chen *et al.,* 2018; Kitinoja 2011; FAO, 2013).

Post-harvest loss which was defined as the degradation in both quantity and quality of a food production from harvest to consumption (Kiaya, 2014) has become a major obstacle in achieving sustainable food supply in Nigeria resulting in high cost across food supply chain and inaccessibility of average households to adequate quality and enough dietary intake. Lack of access to require quality and quantity household food supply leading to food insecurity is not just about insufficient food production, availability and intake, but also as a result of post-harvest, losses which cut across the entire food supply system (Obayelu, 2014; Kumar and Kalita, (2017; Aulakh and Regme. 2013). Food loss occurs during the stages in the post-harvest operations which include harvesting, transportation, drying, storage, processing, sales, and consumption (Atanda *et al.* 2011; Wu *et al.,* 2017).

Indirectly, post harvest losses can lead to reduction in employment opportunities within post harvest value chain and as well in the capital available for stakeholders to either expand their business activities in the value chain or invest in other business enterprises as a way of diversifying their livelihood activities. Studies revealed that as critical as the issue of post harvest losses is, enough attention has not been given to food losses that occur during post-harvest handling especially in developing economies as compared to the attention and concerted efforts directed at production (FAO 2011; Affognon *et al*. 2015; Adebayo *et al*. 2017). World Bank (2011) opine that persistent huge post-harvest losses are symptoms of poorly performing value chains, and it contributes to high food prices, have impact on environmental and climate change. Meanwhile, reduction of just one percent in post-harvest losses can lead to a gain of million US Dollars annually (World Bank, 2011; Kitinoja, *et al*., 2011; Mada, *et al.* 2014), with producers as key beneficiaries of the accrued gain (World Bank 2011). Provision of necessary post-harvest logistics across the value chain with appropriate complimentary infrastructures/facilities, could be a pathway to considerable reduction in food losses and increase in the income levels of actors across agricultural value chain.

Agro-logistics which is a sub-discipline of the general logistics sector is a concept that has been developed and put into use in some countries such as Netherlands, South Africa, Thailand and China, to bridge the gap between food production and consumption by which considerable losses are being recorded annually. In modern agricultural sector development, implementation of functional logistics in food supply chain is imperative, considering the increasing demand and competitiveness of agricultural food products in the world market. This study therefore, assessed agro-logistics bottlenecks in post-harvest value chain and the importance of effective agro-logistic system to improving household and national food security in Nigeria. Also, factors and challenges that contribute to post-harvest losses at different stages of agricultural value chain and its consequences on household and national food security were discussed, in a view to identify appropriate agro-logistic system to address challenges and ensure food security at household and national levels.

Factors and challenges of post-harvest losses

In the wake of Nigeria growing population, ensuring household and national food security in a sustainable manner has become a serious developmental challenge that calls for concerted efforts of respective organisations. Food losses in post-harvest handling have been detrimental to achieving the expected increase in food supply. A significant amount of produce is lost in post-harvest operations due to many factors including; inadequate technology, lack of adequate knowledge in post-harvest handling, bad road network lack of storage system, and poor rural infrastructures. Other factors include improper financial management and technical limitation in harvesting and processing techniques. The effect of post-harvest losses is not limited to mere reduction in food available for household consumption, but also result in other negative consequences to the society in terms of waste management, greenhouse gas emission and loss of scarce resources invested in the production (Aulakh, *et al.* 2013; FAO, 2011).

In Nigeria, losses in post-harvest chain result in high cost of food prices, reduction in income of stakeholders in the value chain especially the farmers and profitability of harvested produce (Obayelu, 2014). While qualitative losses in terms of nutrient, caloric and edibility of food product is said to be common in developed countries (Kader, 2013), both qualitative and quantitative losses in respect of loss in the amount of food produce before consumption are common in Nigeria (Obayelu, 2014) and developing countries (FAO, 2013). In addition, inadequate market information and facilities contribute to high post-harvest losses in Nigeria. Food loss cut across all agricultural production value chain, though the losses varies from commodity to commodity, season to season and by other circumstances in which food produce are harvested, transported, processed, stored and marketed (World Bank, 2011).

Harvest and Transportation stages: Losses occur as a result of inappropriate method of harvest and/or use of harvesting tools, lack of appropriate technology and/or skill for harvesting particular crop. Also, timeliness in harvesting of food crops and bad weather such as heavy rain fall during the time of harvest could be a reason for incurring losses at this stage (Kiaya, 2014) and delay in moving produce from the point of production to either market or processing centre could result in losses. Plate 1 for example, shows that bad road is one of the major factors causing delay in moving agricultural produce from farm to market.

Plate 1: Bad road network at Ijaye in Oyo state, Nigeria; a challenge to transportation of farm produce, which could result in post harvest losses.
Source: Oyegbile (2019)

Agricultural products are highly perishable, thus delay in conveying harvested crops to the point of sale or consumption will result in losses. Delay in transportation of harvested produce could be as a result of unavailability of vehicle at appropriate times, damage to vehicle due to bad roads or lack of financial capability of producers to hire vehicle as at when needed and inappropriate means of transportation, (see Plate 2 for example).

As stated by Kiaya (2014), in most developing countries, transport vehicles and other modes of transport, especially those suitable for perishable crops, are not widely available, while appropriate transport systems and refrigerated transport are lacking. Lack of appropriate harvesting containers (Dandago, *et al.* (2016) and handling during the process of harvesting also contribute to losses at the harvesting stage.

Plate 2: Means of transportation of farm produce at Buruku LGA Benue State.
Source: Oyegbile (2016)

Processing and Storage stage: Poor processing systems, technologies, skill/knowledge as well as traditional processing and marketing practices can be responsible for high losses (Atanda, *et al.,* 2011; Kiaya, 2014). Losses are recorded at both primary and secondary processing activities, which mostly involved the use of traditional practices and tools rather than improved technologies that could enhance efficiency and effectiveness in the processing of agricultural produce. For example the use of traditional tools

such as knife as shown on Plate 3, could reduce the quantity and perhaps the quality of cassava processing in a given period of time.

Also, lack of appropriate means of drying agricultural produce contribute to qualitative and quantitative losses as shown on Plates 4, 5 and 6.

Storage system of agricultural food produce in Nigeria market has become problematic in the sense that not many purpose-built agricultural food storage facilities are available.

Plate 3: Use of traditional tools for peeling cassava at Osanetu, Iseyin, Oyo State.
Source: Oyegbile (2019)

Plate 4: Yam flour being dried on bare ground at Aba Oba village, Iseyin Oyo State, Nigeria. This could lead to quality and quantity losses
Source: Oyegbile (2019)

Plate 5: Cassava flour spread by the roadside along Ibadan - Eruwa road, Oyo State Nigeria; Qualitative and quantitative losses
Source: Oyegbile (2018)

Plate 6: Drying of cassava flour by the roadside at Ido LGA Oyo State, Nigeria.
Source: Oyegbile (2018)

High technology based processing practices such as canning and freezing require a high capital, high energy costs and expensive packaging (Atanda, *et al*., 2011) that are not readily available. In other words, technical limitations in processing techniques contribute to post harvest losses. For instance, Plate 7 shows local means of rice processing which invariably result in poor quality of the processed rice, and loss of reasonable quantity of the rice being processed.

Virtually, in all farm produce collection points across the country, referring to local markets in rural areas where agricultural food produce from different farms and settlements are assembled for marketing and/or processing, also known as farmers market, good storage facilities are either completely lacking or the available ones are in poor condition.

Plate 7: Local rice processing centre at Shabaoshi Katcha LGA, Niger state Nigeria
Source: Authors File (2017)

The figure below shows stages of post-harvest value chain and losses that occur at each of the stages. Agro-logistics is needed along the value chain to reduce losses often recorded in the process of adding value to agricultural produce.
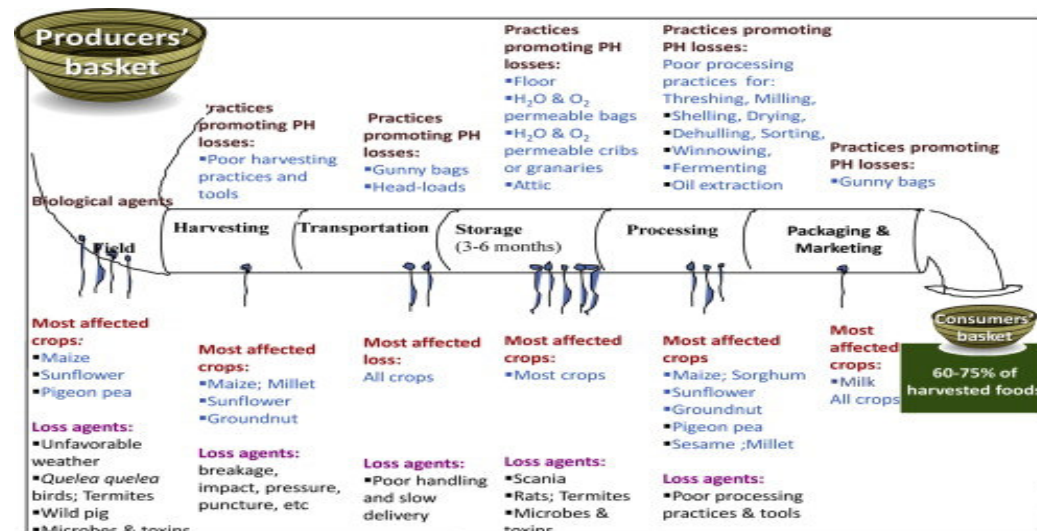
Adapted from; Adebayo Abass *et al* (2014)

Agro-logistics concept and bottlenecks to reducing postharvest losses

In general terms, logistics has been considered an issue deserving modest priority in nations' economy. According to Lukinykh and Lukinykh, (2016) effective logistics system is a significant competitive advantage in the marketing world. In a publication by the Department of Agriculture, Republic of South Africa in 2006 on the status of agro-logistics in the country, it was expressed that logistics is a part of the supply chain process which deals with the transportation, warehousing, as well as inventory administration and management of physical products between the point of production and delivery to the final consumer. In the same vein, Slavkova and Solovey, (2016) stated that logistics is a tool for the rational utilisation of resources, reduction of time expenditures and financial resources on the way of bringing products to consumers. In a World Bank position note on agro-logistics, Vorst van der and Snels, (2014) stated that, as part of supply chain, logistic management plans, implements and controls the effectiveness and efficiency of forward and reverse flow and storage of goods, services and related information between the point of origin and the point of consumption so as to meet the requirement of customers. Relating this to agro-logistics, Wang (2012) states that agricultural products logistics is a branch of the logistics industry which refers to flows of physical entities and related information from producer to consumer that satisfy consumer's demand, including agricultural production, acquisition, transportation, storage, loading and unloading, handling, packaging, processing, distribution, and information activities.

According to Kramar *et al.* (2014) objectives of agricultural products logistics are to increase value-addition of agricultural products, save distribution costs, improve circulation efficiency and reduce unnecessary losses, as well as avoid market risks. Xu (2011) defined agro-logistic as an integrated industrial activity of integrated operation and management relying on advanced computer networks and information technology, integrating the use of modern transport and storage facilities, through a large number of business information instructions, engaged in agricultural transportation, storage, processing, handling, packaging and processing, distribution and information processing. From the definition, it can be inferred that optimizing the distribution channels of agricultural products, reducing operating costs of agriculture-related enterprises as well as providing faster and better service to consumers of agricultural products are the aims of integrating logistics system into agricultural food supply chain (Kramar, *et al.* 2014).

Taking agricultural products as the core, Li *et al.* (2013) stated that agricultural products logistics refers to the organic combination of the entity flowing from producer to receiver and the involving technology, organisation, management and other basic functions. According to Li, *et al.* (2013), agricultural products logistics consists of a series of links, including agricultural production, purchase, transport, storage, loading and unloading, handling, packaging, distribution, circulation processing and, information activities, while realizing agricultural product appreciation and organisation objectives in the process.

Analysing the underlying principle critically, it implies that if the entities comprised in agro-logistics system is provided, and efficiently managed, the system could be seen as a value-adding process that can directly address the problem of losses in food supply across post-harvest value chain. It will significantly enhance the competitiveness of food supply chain in terms of related services, information requirements, profitability (as it accrued to producers) and adherent to rules and regulations concerning quality food supply across Nigeria in particular and the global community at large. Logistics in agricultural value chain allows for flexibility in responding to market demands (Lukinykh and Lukinykh, 2016) and covers all activities that are required to convey agricultural produce from farm where it is being produced to market and/or final consumers. The need to improve the competitiveness of agricultural food sector by developing strategies that will lead to massive investment in logistic systems to efficiently support agricultural sector is imperative. This will create an opportunity for the sector to establish a logistic strategy will ensure that unique demands for global food supply are met in a sustainable manner.

According to Shufeng *et al.* (2010) modern agro-logistics should consist of 12 functional elements of procurement, supply, storage, transportation, loading and unloading, sorting, packaging, distribution, distribution processing, marketing, recycling, and information control. As suggested by Shufeng, *et al.* (2010) responsibility of modern agro-logistics system management should not only be directed at solving the problem of high cost of logistics process in agricultural sector and reducing losses in the post-harvest chain, but also to find sustainable ways through research to promote the functional elements of the system to comprehensively play the integrated effects in lowering production cost, raising economic benefits for agriculture, raising the income of peasant producers and pushing forward modern agricultural economic development.

The fundamental principle of agro-logistics system according to Vorst van der and

Snels, (2014) is to ensure that the right agro-product gets to the right place, at the right time in the right specification; in quality and quantity at the lowest cost. Meanwhile, bottlenecks in agro-logistics contribute to rural poverty and food wastage (Vorst van der and Snels, 2014), resulting in threat to household and national food security. The bottlenecks are caused by lack of required entities to carry out the aforementioned functional elements of agro-logistics. In addition, lack of adequate knowledge and skill in modern technologies for value-adding logistics process and services by larger proportion of Nigerian farmers especially the peasant farmers also constitute bottleneck in agro-logistics. Modern advanced technologies for post-harvest value chain practices are either not available in Nigeria or out of the reach of majority of actors in the food supply chain. Another agro-logistic bottleneck is information constraint in terms of insufficient access to and/or use of ICT that are necessary to easily access related information in the global food supply chain to meet up with the competitiveness and profitability of agricultural produce.

As concerted efforts are being directed at increasing food production in the country, adequate attention should as well be given to effective agro-logistics in the agricultural value chain. This will not only ensure getting agricultural products to the right market or consumers, at the right time, in the required quality or specifications, but also, reduce costs along the value chain and increase the revenue of actors in food supply chain, thereby contributing to sustainable food security at household and national levels.

CONCLUSION AND RECOMMENDATIONS

This paper revealed that agro-logistic limitations in post-harvest value chain has limited agricultural sector in achieving its full potentials in Nigeria, despite the efforts and resources invested in the sector. Agro-logistic limitations have contributed to post harvest losses in the country. Consequently, exploring profitability and entering into the global competitive market in food supply has becomes very difficult milestone to attain. Losses are incurred at every stage of post-harvest handling; harvesting, processing, storage, transportation and marketing. Apparently, there have been reductions in the quality and quantity of food supply that get to the final consumer. A continuous, interlinked chain in logistics practices that will cut across all the components of food supply value chain is of great importance. Rural enterprises which play a significant role in household and national food supply should have sufficient access to the mainstream of logistics system that will ensure timeliness in agricultural value chain processes, with marginal loss of food in the process. Therefore, it is recommended that actors in food supply chain should be armed with knowledge and skill of sustainable techniques at each stage of the post harvest value chain, while effective agro-logistic practices should be ensured through the provision of the entities in logistic system. Also, agro-logistic hubs with well equipped modern technologies and other complimentary infrastructures should be established at strategic agricultural produce collection points i.e. rural 'farmers' markets' across the country. This will invariably reduce food loss along the value chain; enable the country to meet up with the global competitive trend in food supply demands and the profitability potentials of agricultural food production sector while the actors within the value chain make reasonable profit from their respective activities within the chain.

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INFORMATION NEEDED WHILE USING ICTS AMONG MAIZE FARMERS IN DANGBO AND ADJOHOUN FARMERS IN SOUTHERN BENIN REPUBLIC

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ABSTRACT
This study assessed Information needed while using ICTs among maize farmers in Dangbo and Adjohoun in southern Benin Republic. Data were collected from a random sample of 150 maize farmers. The data collected were analysed using descriptive statistics and inferential statistics used were Chi-square, Pearson's Product Moment Correlation and t-test at p=0.05. The results showed that farmers' mean age was 43±1 years and were mostly male (88.0 %), married (88.0 %), Christians (67.3%) and 48.7% had no formal education. Prominent constraints to ICTs use were power supply ($\overline{X}$ =1.80) and high cost of maintenance of ICTs gadget ($\overline{X}$ =1.58). The most needed information by farmers using ICTs was on availability and cost of fertilisers insecticides and herbicides ($\overline{X}$ =1.20) and availability and cost of labour ($\overline{X}$ =1.16). Farmers' constraints (t=2.832; p=0.005) significantly differed between Dangbo and Adjohoun communes. The information need of farmers in Dangbo and Adjohoun communes (t=0.753; p=0.453) do not significantly differ. The study concluded that the major barriers facing ICTs usage were power supply and high cost of maintenance of ICTs gadget; and there is the need for information on agricultural inputs. The study therefore recommended that government agencies in charge of power supply should make effort to ensure steady power supply.
Keywords: ICTs, Information need, Constraint, Maize production, Farmers

INTRODUCTION

Cereal production provides the bulk of the staple diet for the world population. In Benin republic, the achievement of food security and the fight against poverty are partly based on the intensification of cereal production. This production is characterised by low productivity and annual fluctuations in the production of food crops. Among these cereals is maize (*Zea mays L.*), which plays an important role for both food security and the national economy. Azontonde, Igué, and Dagbenonbakin, (2010) found that maize yield is far lower than the potential achievable yields (between 3 and 5 ton/hectare).

In Benin, maize is the most widely cultivated food crop (Abadassi, 2013). Aly, Salami, Yallou, Adjadohoun and Baba-Moussa (2016) also found that maize is the first cereal grown in Benin

Maize production faces many challenges that extension structures together with research centres are trying to find solutions. In the study area (Adjohoun and Dangbo), where maize production has been declining in recent years, as shown in the general report volume 1 on the 2015 assessment of food production and the food outlook for 2016 in Benin (ONASA, 2016). Maize farmers thus need information to optimize production. Due to all these problems, agricultural agents need to use adequate information tools to inform farmers on time. The use of ICT can progressively reduce the costs of managing information, enabling individuals and organisations to undertake information-related tasks much more efficiently, and to introduce innovations in products, processes and organisational structures in agriculture sector

in Benin. (Adégbidi, Mensah,Vidogbenan and Agossou, 2012).

The improvement of maize production can be brought about by enhancing capacity for improving access to information through ICTs gadgets. However, constraints such as power supply, problem of connectivity, complexity of modern ICTs, low literacy level, low local content, and high cost of ICTs gadgets must be considered.

Therefore, this study investigated the Information need on improving maize production among Dangbo and Adjohoun farmers in. southern Benin Republic

The specific objectives are to;
1. identify personal and enterprise characteristics of maize farmers ,
2. determine information needed by farmers while using ICTs in the study area ,
3. ascertain the constraint to respondents' utilisation of ICTs for improved maize production ,

The hypotheses of the study are;

H_01: There is no significant difference in the constraint faced by maize farmers while using ICTs among maize farmers in Dangbo and Adjohoun.

H_02: There is no significant difference in the information needed while using ICTs among maize farmers in Dangbo and Adjohoun.

METHODOLOGY

This study was carried out in southwestern Benin Republic which comprises two communes which are Adjohoun and Dangbo. The study area is culturally homogenous and populated mainly by

the Goun and Wémin ethnic group and is hence unified by two general languages, Goun and Wemin. It is located in the department of Ouémé between 6° 36 'and 6° 43' of north latitude and between 2° 21 'and 2° 35' of east longitude, the communes of Dangbo and Adjohoun are bounded in the north by the commune of Bonou, in the south by the commune of Aguégués, in the east by the commune of Sakété and in the west by the Commune of Zè. It covers an area of 457 km² (INSAE, as cited in Abou,Yabi,Yolou, and Ogouwale 2018).

The study population consisted of all maize farmers in the double Dangbo-Adjohoun communes, Benin Republic. Multi-stage sampling procedure was used to select the respondents for this study. **First stage**: Adjohoun commune comprises 8 districts, while Dangbo commune comprises 7 districts. Forty percent (40**%**) of the district was randomly selected in Adjohoun (3) and Dangbo (3) to give a total number of 6 districts: Awonou; Gangban and Azowlisse districts in Adjohoun commune, while Dangbo, Houètin-Houédomey and Zounguè were selected in Dangbo. **Second stage**: In this stage, from each 6 selected districts, each village was randomly selected. **Third stage:** 15% of maize farmers was proportionally selected in each village to yield a total number of 1010 maize farmers. Data were analysed using descriptive statistics such as frequency counts, percentages while inferential statistics (t- test) were used to analyse study hypotheses. Data were collected from respondents using structured questionnaire and analysed using descriptive statistics, PPMC and t-test at α 0.05. Constraints while using ICTs among maize farmers were obtained by presenting farmers with a list of 10 items on constraints using a 3 point scale of serious constraint, mild constraint and not a constraint with scores of 2, 1 and 0 assigned respectively. The maximum score obtained was 20 for maize farmers, and the minimum was 3.Weighted mean scores were generated and were used to rank constraint items in order of severity. Information needed while using ICTs among farmers were obtained by presenting a list of 17 items on information needed. This was measured using a 3-point scale of, to a greater extent (2), to a lesser extent (1), not a need (0). The maximum obtained score was 27 and the minimum score was 0. Respondents' scores on information need was summed, while the mean score was computed. Weighted mean scores were generated and were used to rank the level of information needed while using ICTs.

RESULTS AND DISCUSSION

Personal and enterprise characteristics information in Table 1 shows that 33.3% of the respondents were old, 45.3 % were adult and others were young with the mean age of 43.73±1.05 years. Older farmers were assumed to have gained knowledge and experience over time and are better able to evaluate technology than young farmes.88.0 % of the respondents were male, and 67.3% of the respondents were Christians. This shows than more male were involved in farming than female. The male dominance might be due to the culture of the area which does not allows women to have more land. 88.0 % of maize farmers were married, 48.7 % had no formal education. This finding is similar to that of Olaniyi and Ismaila (2016) who reported that majority (84.0 %) of the sampled maize farmers in Ondo State were male and married. Also 39.3% were between the farming experiences of 16-27 year of farming experience with mean age of 23.75±0.99. This implies that majority of respondents had been into maize production for a long time.Also 55.3 % had between 3 and 5 ha of farm size and 38.7 % get maize seeds from more than one place.

Constraint faced by farmers while using ICTs

Table 2 shows result on the types of constraint that the farmers faced. Most serious constraint is power supply ($\overline{X}$ =1.8) followed by High cost of maintenance of ICT gadget ($\overline{X}$ =1.8), high Complexity of modern ICTs ($\overline{X}$ =1.8) Constraints that were considered as not been serious include low local content (29.6%), lack of time out of busy schedule (30.9%).Thus, the technical nature of some ICTs and infrastructure required were the most serious constraints. The result of this study agreed with of Olaniyi (2013) who found that poor power supply and inadequate access to ICTs are among the major constraints associated with the use of ICTs.

Table 1: Farmers' personal and enterprise characteristics (n=150)

Characteristics	Category	Frequency	Percentage	Mean±SD
Sex	Male	132	88.0	
	Female	18	12.0	
Age	Young (<35years)	32	21.3	
	Adult (35-50years)	68	45.3	
	Old (≥50years)	50	33.3	
	Mean±SD			43.73±1.05
Marital status	Single	13	8.7	
	Divorced	1	0.7	
	Widowed	3	2.0	
	Married	132	88.0	
	Separated	1	0.7	
Religion	Christianity	101	67.3	
	Islam	13	8.7	
	Traditional	36	24.0	
Education	No education	73	48.7	
	Primary	46	30.7	
	Secondary	22	14.7	
	Tertiary	9	6.0	
Farming experience	4-15	43	28.7	
	16-27	59	39.3	
	28-39	25	17.3	
	40-51	20	13.3	
	≥52	2	1.3	
	Mean±SD			23.75±0.99
Farm size	Small (< 2 ha)	40	26.7	
	Medium (3-5 ha)	83	55.3	
	Large(>5ha)	27	18.0	
Source of seed	Own production	44	29.3	
	Market	24	16.0	
	Territorial Agencies for Agricultural Development	24	16.0	
	More than one place	58	38.7	

Source: Field survey (2019)

Table 2: Constraints to use of ICTs by maize farmers (n=150)

NO	Constraints	Not constraint	Mild constraint	Serious constraint	Mean	Rank
1	High cost of ICTs gadgets	13.3	34.5	52.1	1.39	5th
2	Low local content	33.1	37.2	29.6	0.97	10th
3	Low literacy level	16.3	36.1	47.5	1.31	8th
4	Difficulty in retrieval of information	14.7	36.4	49.0	1.34	6th
5	Loss of signal form source	9.9	47.7	42.4	1.33	7th
6	High cost of maintenance of ICT gadget	9.3	23.7	66.9	1.58	2nd
7	Lack of time out of busy schedule	17.9	51.2	30.9	1.13	9th
8	Complexity of modern ICTs	14.0	16.2	69.8	1.56	3rd
9	Problem of connectivity	11.3	30.1	58.6	1.47	4th
10	Power supply	6.7	13.4	79.9	1.8	1st

Source: Field survey (2019)

Information needed by farmers while using ICTs

Table 3 shows the weighted mean score of the respondents based on their information need on maize production activities using ICTs. The information most needed using ICTs as indicated by the respondents include acquisition of agricultural inputs market information, availability and cost of labour ($\overline{X}$=1.20) and availability and cost of fertilisers, insecticides and herbicides

($\overline{X}$=1.16). Maize farmers have more interest using ICTs to know either maize inputs production are available in the market or not. Then, market information as to know market price in the market ($\overline{X}$=1.16). The result of this study shows the relevance of marketing of maize to farmers and according to Usman, Oluyole and Ajijola, (2012), that marketing information is one of the most relevant ICT services, which could be offered to farmers in developing countries.

Table 3: Information needed by maize farmers (n=150)

Types of information need		Greater extent	Lesser extent	Not a need	Mean	Rank
Installation of the culture	Choice of the plot	4.7	10.7	84.7	0.20	12th
	Choice of variety of maize	6.0	24.7	69.3	0.37	10th
	Choice of seeds	6.7	27.1	66.2	0.41	9th
	Weather (Weather Information)	0.7	14.7	84.7	0.16	13th
Technical itineraries	Crop protection	6.0	37.0	58.0	0.49	7th
	Best Cultural Practices (From sowing to harvest)	9.5	29.3	61.2	0.48	8th
	Storage of products (which products and packaging to use, when to store / destock ... among others)	2.7	21.2	76.0	0.27	11th
	Product prices in the markets	32.0	51.7	16.3	1.16	2nd
	Market demand	20.3	56.7	23.0	0.97	4th
Market Information	Availability and cost of means of transport	27.0	35.9	37.2	0.90	5th
Acquisition of agricultural inputs	Availability and cost of labor	41.4	33.1	25.5	1.16	2nd
	Availability and cost of fertilisers, insecticides and herbicides.	32.8	54.1	13.0	1.20	1st
Others	Periods of execution of operations	2.1	11.9	86.0	0.63	6th
	Planting date	1.4	5.0	93.6	0.08	16th
	Date of Fertilisation	2.1	10.0	88.0	0.14	14th
	Date of interview	0.0	12.0	88.0	0.12	15th
	Harvest date	0.0	5.0	95.1	0.05	17th

Source: Field survey (2019)

Independent sample t-test on the constraints faced by maize farmers between Adjohoun and Dangbo

As shown in Table 4 there was significant difference in the constraints faced between Adjohoun and Dangbo maize farmers (t=2.832; p=0.005). Constraints faced by farmers in Adjohoun was higher relative to Dangbo. The

differences in the level of constraints observed between the two locations might be attributed to the severity of inadequate power supply in Adjohoun but solar panels were used by Dangbo farmers to address electricity problems. Though, this does not connotes complete absence of power challenges in Dangbo.

Table 4: Independent sample t-test on the constraints faced by maize farmers while using ICTs between Adjohoun and Dangbo

Commune	N	Mean	Standard Deviation	Mean difference	t-value	p- value	Decision
Adjohoun	74	13.97	3.989	1.903	2.832	0.005	Significant
Dangbo	76	12.07	4.103				

Level of Significant = 0.05
Source: Field survey (2019)

Independent sample t-test on the information needed by maize farmers while using ICTs between Adjohoun and Dangbo

Table 5 shows that the information by maize farmers needed while using ICTs in Adjohoun and Dangbo was not significant. It reveals that there is not significant difference in the constraint of the ICTs use between Adjohoun and Dangbo maize farmers (t=0.753; p=0.453).This shows that the level of information in the two communes are relatively similar.

Table 5 : Independent sample t-test on the information needed while using ICT by maize farmers between Adjohoun and Dangbo

Commune	N	Mean	Standard Deviation	Mean difference	t-value	p- value	Decision
Adjohoun	74	8.39	4.742	0.549	0.753	0.453	Not Significant
Dangbo	76	7.84	4.189				

CONCLUSION

The study concluded that maize farmers while using ICTs among maize farmers in Dangbo and Adjohoun needed various kind of information. The information most needed while using ICTs gadgets are availability and cost of fertilisers, insecticides and herbicides, product prices in the markets, availability and cost of labor…while the major constraints faced are power supply, high cost of maintenance of ICT gadget, complexity of modern ICTs. It is noticed that the level of information needed while using ICTs in Dangbo and Adjohoun are relatively similar.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations were given;

1- Government agencies in charge of power supply should make effort at ensuring that there is steady power supply or make solar panels available and accessible for farmers in order to encourage the use of ICT channels.
2- Since the information most needed while using ICTs gadgets are availability and cost of fertilisers, insecticides and herbicides, government and NGOs should make agricultural inputs available to farmers at subsidised rate.
3- Make radio broadcasts to inform daily,the price of raw mterials and the price of agricultural products on the market.
4- Since most of the farmers had no formal education, workshops and short courses can be organised by policy makers to educate them on ICTs to enable them to acquire agricultural information that can develop skills to improve their production.

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BENEFITS ASSOCIATED WITH INTEGRATED FARMING SYSTEM PRACTICE AMONG FARMERS IN KAINJI LAKE BASIN, NIGER STATE, NIGERIA

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ABSTRACT
The study examined the benefits associated with integrated Farming System (IFS) among farmers in Kanji Lake Basin, Niger State. Specifically, channels of receiving information about IFS were identified; benefits of the IFS practice determined and constraints inhibiting spread of IFS were also identified. A three-stage sampling technique was used to select 150 respondents. Structured interview schedule was used for data collection while frequency counts, mean score, bivariate correlation and chi-square were used for data analysis. Results reveal that 39.3% of the respondents had formal education while 50.0% had fishing as the primary means of livelihood. Friends and relations ranked highest ($\bar{x}$=2.9) as the major source of information on IFS, while National Institute for Freshwater Fisheries Research (NIFFR) ($\bar{x}$=2.8) ranked second highest. The most important constraints of IFS were high cost of inputs with (2.8) unavailability of inputs and complexities of the techniques of IFS ($\bar{x}$=1.9). Main benefits associated with IFS included tremendous improvement in farmers' means of livelihood' with weighted mean score ($\bar{x}$=1.8), increase in income of farmers ($\bar{x}$=1.7), increase in yield of fish ($\bar{x}$=1.7) and increase in rice yield ($\bar{x}$=1.6). Based on findings of the study, it was concluded that IFS have the potentials to increase agricultural production, income and overall standard of living of the farmers. It was recommended that extension organisations should create more awareness and train farmers on the use of IFS techniques.
Keywords: Agricultural enterprises, yield, standard of living, Integrated Farming System

INTRODUCTION

In spite of the present domination of petroleum, a non-renewable resource, as the country's major foreign exchange earner, agriculture remains a relevant bedrock of the nation's economy. The sector currently accounts for about 55.8% of the nation's Gross Domestic Product (GDP) and 88% of the non-oil foreign exchange earnings (CBN 2019). It is also employs about 70% of the active labor force as well as provides raw materials for the Agro-allied industrial sector. Agricultural provides the staple food consumed by the Nigerian population (CBN, 2019).

According to Ayinla (2012), Agricultural sector has not fulfilled the expectations of the farmers as most of them are poorly fed and of low socioeconomic status. Also, the level of food intake by most Africans, Nigeria inclusive is below the recommended level of 2600 kcal calories and 65 grams of protein per day (FAO, 2017). The low level of income, food insecurity and low calories intake are major concerns to all the tiers of government in Nigeria. The Food and Agricultural Organisation FAO (2018) reported that Nigeria produced approximately 4 million metric tons of milled rice and imported roughly 2.9 million metric tons excluding estimated 600,000 metric tons suspected to enter the country illegally on an annual basis. The fisheries sector contributed about 3.4 percent to the country annual Gross Domestic Product in 2018 by National Bureau of Statistics (NBS, 2018).

In spite of the foregoing, domestic fish and rice production still fall far below the total demand. As a result, the country resorted to importation of rice and fish. In addressing this, the Federal Government of Nigeria vigorously pursued policies and programme aimed at improving food production and socioeconomic status of the farmers. The primary aims of any of these programs was the attainment of self-reliance and self-sufficiency in food production and provision of raw- materials for the industries. As a result of food challenges faced by farmers there is need for adequate knowledge on IFS.

Integrated Farming System (IFS) is a system of farming which involves simultaneous activities involving crop and animal production. The main purpose of the IFS is that the farming components support one another; hence, reducing heavy reliance on external inputs (John, 2016). In many parts of the world, integrating crop, livestock and fisheries are common practice. For instance, the crop can serve as animal feed/fodder for the livestock, and the livestock also provides organic manure to maintain soil fertility. Integrated Farming System plays a major role in increasing employment opportunities, nutrition and income for rural populations and it has received considerable attention in recent years. John (2016) reported low awareness on integrated farming system (IFS). However, National Institute for Freshwater Fisheries Research Nigeria presently in Kainji in Niger State has created awareness and encouraged farmers on continuous use of IFS approach to rice and fish production in the study areas. This is expected to facilitate increase in fish and rice production within the Kainji lake region. However, there is dearth of information in literature documenting the perceived benefits of integrated farming system from the farmers' perspective in the study area. This understanding therefore, provides the basis for the study to

examine the benefits of IFS among farmers in Kainji Lake Basin, Niger State, Nigeria. The specific objectives were to;

i. identify the channels through which information about integrated farming system were disseminated to farmers in the study area,

ii. examine the benefits of integrated farming system in the study area

iii. identify constraints militating against the spread of integrated farming system in the study area.

The hypothesis of the study was stated in null form that there is no significant relationship between selected socioeconomic characteristics and and benefits associated with integrated farming system.

METHODOLOGY

Lake Kainji, which is the largest man - made lake in Nigeria, was created in 1968 after the damming of River Niger for electricity generation by the then Electricity Corporation of Nigeria (ECN) now Mainstream Energy Solutions Limited. The Lake lies between Latitudes 9^0 50'and 10^0 55'N, and Longitudes 4^0 25' - 4^0 45' E and between the borders of Sub - Saharan and Northern Guinea Savanna zones.

All the farmers in the Kainji Lake Basin area of Niger State, Nigeria constitute the population of the study. A multi-stage sampling procedure was used to select rural farmers in the study area. Three cells from the available 27 cells were purposively selected based on their high involvement in rice and fish production. Three communities each from the selected three cells were randomly selected. The final stage involved proportionate random selection of 10% of the respondents in each of the nine communities. Thus a total of 150 farmers were selected for the study. Primary data were collected through the use of structured interview schedule and were analysed using appropriate descriptive and inferential statistics.

The dependent variable of the study was perceived benefits associated with practice of integrated farming system. It was measured on a 3 point likert-type scale. Respondents were requested to respond to what extent they agreed to some statements averring benefits associated with use of integrated farming system vis: strongly agreed (3 points), moderately agreed (2 points) and disagreed (1 point). The mean score for each of the statement was estimated and used for the ranking of the benefits associated with IFS. The independent variable, constraints militating against the spread of integrated farming system among farmers, was measured on a 3-point Likert-type scale vis: highly severe (3 points), Fairly severe (2 points) and not severe (1 point). Other independent variables such as age, income, household size were measured at ratio level with absolute values recorded while others such as sex, marital status, religion, etc were measured at nominal level.

RESULTS AND DISCUSSION
Socioeconomic characteristics

Results in Table 1 show that 98.0% of the respondents were male and 2.0% were female. This shows that the male constituted most of the farmers in the study area. The result also showed that 40.7% of the respondents were aged between 31 to 40 years. The mean age was 43 years. This implies that the respondents are still relatively young. Consequently they were supposed to be more physically able to carry out farming operations and adopt innovations (improved practices) since younger people are more mentally alert and have greater flexibility in accepting new ideas in dealing with risks (Smith et al., 2009). Similarly, majority (85.3%) of the respondents were married. Marriage is a norm that offered the opportunity to get children and wives that are used as source of farm labour. In the same vein more than one–third (39.3%) of respondents acquired formal education. Acquisition of formal education had been found to be related to participation in social activities (Ekong, 2003).

Table 1 further reveals that majority (87.3%) of the respondents had an average of 6 members of household. All the respondents had between 1-5 years of experience in integrated farming system, with mean years of experience been 3 years. This result indicates farmers in the Kainji lake area have, for sometimes, been used to the IFS. Furthermore, result shows that half (50.0%) of the respondents had fishing as their primary means of livelihood. It was a small proportion (16.0%) of the respondents that practiced integrated fish with rice production, while a smaller proportion (1.3%) of the respondents practiced fish, poultry and rice integration. The low level of integration of fish, poultry and rice calls for additional effort to popularise the innovation in the study area.

Table 2: The Socioeconomic Characteristic of the Respondent

Socioeconomic Characteristic	Frequency	Percentage	Mean
Sex			
Male	147	98.0	
Female	3	2.0	
Age (years)			
16-20	3	2.0	
21-30	29	19.3	
41-50	61	40.7	43.36
51-60	44	29.3	
61-70	11	7.3	
Above 70	1	0.7	
Religion			
Islam	128	85.3	
Christianity	22	14.7	
Marital status			
Married	128	85.3	
Single	22	14.7	
Level of education			
No formal education	1	0.7	
Primary school	12	8.0	
Secondary education	37	24.6	
Tertiary education	4	2.7	
Quranic education	95	24.3	
Household size			
Below 5	131	87.3	
6-10	18	12.0	6
11-15	1	0.7	
Years of experience			
0-5	150	100.0	
Occupation			
Civil service	6	4.0	
Crop farming	42	28.0	
Fishing only	75	50.0	
Fish with Poultry	1	0.7	
Fish with Rice	24	16.0	
Fish, Poultry and Rice	2	1.3	

Source: Field Survey, 2018

Channels through which integrated farming system was introduced to farmers

The results in Table 2 reveal that the most prominent channels through which integrated farming system was introduced to farmers included friends and relative ($\overline{x}$ =2.9), National Institute for Freshwater Fisheries Research ($\overline{x}$=2.7), Extension Agents ($\overline{x}$=2.1). Print media sources, such as poster, newspaper pamphlet were rarely used as channel of accessing information on integrated farming system. This was understandable as slightly above one-third ($\overline{x}$=39.3%) of the respondents had formal education. Therefore, many of the respondents would probably not be able to read and interpret information in these media. Thus friends and relations constituted the main source of information by farmers on integrated farming system. This was in agreement with the findings of Tologbonse *et al*. (2006) that rural households depend on friends and neighbors for agricultural information.

Benefits of integrated farming system in Kaniji lake basin

Table 3 summarises the benefits derived in using integrated farming system in the study area. The benefits along with weighted mean score include: improved standard of living ($\overline{x}$=1.8), Increased incomes of farmers ($\overline{x}$=1.7), increased yield of rice ($\overline{x}$=1.6), increased yield of fish ($\overline{x}$=1.3), acquisition of knowledge ($\overline{x}$=1.3), acquisition of skills ($\overline{x}$=1.1), increased number of farmers that are involved in the use of integrated farming system for agricultural production ($\overline{x}$=1.0). The results indicate that integrated farming system increase yield of rice and fish. Therefore, it could be inferred that integrated farming system has the potential to reduce reliance on importation of rice and fish to meet the citizen's requirements of these feeding stuffs.

Table 2: Distribution of respondents by channels through which they received information on integrated farming system

Information Sources	Often	Rarely	Not used	Mean	Ranking
NIFFR	74.7	24.0	1.3	2.7	2nd
Radio	4.7	92.0	3.3	2.0	4th
Television	0.0	23.3	76.7	1.2	5th
Internet	0.7	4.0	95.3	1.1	6th
Extension agents	10.0	88.0	2.0	2.1	3rd
Friends and relations	95.3	2.0	2.0	2.9	1st
Newspapers/magazines	0.0	0.7	99.3	1.0	7th
Pamphlets	0.0	0.7	99.3	1.0	7th
Posters	0.0	0.7	99.3	1.0	7th
Non-governmental Organisations	0.0	0.7	99.3	1.0	7th

Source: Field survey, 2018

Table 3: Benefits of integrated farming system in Kainji Lake Basin

Benefits	Strongly Agreed	Moderately Agreed	Disagreed	Mean	Ranking
Increase yield of fish	20	13.3	66.7	1.7	2nd
Increase yield of rice	4.0	50.7	45.3	1.6	3rd
Increase yield of poultry	0.7	1.3	98.0	1.0	6th
Increase income of farmers	4.7	60.7	34.7	1.7	2nd
Acquisition of knowledge	0.7	25.3	74.0	1.3	4th
Acquisition of skills	0.7	14.0	85.3	1.1	5th
Improve standard of living	28.7	67.3	4.0	1.8	1st

Source: Field survey, 2018

Constraints militating against the use of integrated farming system

Table 4 shows the constraints militating against the use of integrated farming system along with the mean score. These include: high cost of inputs ($\bar{x}$=2.8), inputs for integrated farming system were not available ($\bar{x}$=2.6), inadequate knowledge about integrated farming system ($\bar{x}$= 2.6). It was overt that the most severe constraints include high cost of inputs, unavailability of the inputs, and inadequate knowledge about integrated farming system.

These results concurred with the findings of Wetengere (2009) who reported that when analysing determinants of adoption of improved maize variety in coastal lowlands of Kenya found high cost and unavailability of seed as one of the factors responsible for low rate of adoption. These findings have implications on sustaining the practice of IFS amongst farmers, if they remain unaddressed. Farmers, should therefore, constitute themselves into cooperatives through which they can share knowledge and skills about integrated farming system. This will also facilitate joint purchase and use of inputs. This will minimise the cost of implementation of IFS. Also, both NIFFR and extension organisation should increase the tempo of training for the farmers on integrated farming system in order to increase skills and knowledge acquisition about integrated farming system by the farmers.

This will probably lead to increase in number of farmers that will be continuously using integrated farming system, which in turn will lead to increased yield and overall standard of living of the farmers, since as earlier reported, integrated farming system was considered to increase yields of rice and fish and farmers' income.

Hypothesis testing

As shown in Table 5, only educational level was found to be significantly related with benefits associated with IFS (X^2=43.35) at 0.01 level of significance. Other socioeconomic characteristics considered were non-significant. These results indicate that increasing respondents' level of education could probably enhance benefits attained from practice of IFS by the farmers. This is not unexpected as education received by adults is goal-oriented and would be targeted towards meeting their specific knowledge needs in relation to IFS. This submission again buttressed earlier assertion on the need for NIFFR and extension organisation to undertake the task of educating the farmers in the Kainji Lake region about IFS.

Table 4: Constraints militating against the use of integrated farming system

Constraints	Highly severe	Moderately severe	Less severe	Mean	Ranking
The change agents are grossly incompetent to demonstrate integrated farming system technology	6.0	38.7	55.3	1.50	6th
NIFFR extension staff/farmers ratio is low	8.0	14.0	78.0	1.3	7th
Lack of adequate knowledge about integrated Farming system	60.7	35.3	4.0	2.56	3rd
Inputs for integrated farming system are not Available	66.7	30.7	2.7	2.64	2nd
High cost of inputs	84.7	14.7	0.7	2.84	1st
The integrated farming system is culturally unacceptable	0.0	0.7	99.3	1.00	8th
There are competing demand for land and water for other economic use	10.0	62.7	27.3	1.82	5th
Integrated farming system is labor Intensive	11.3	75.3	13.3	1.98	4th

Source; Field survey, 2018

Table 5: Showing relationship between selected socioeconomic characteristics and benefits associated with practice of integrated farming system

Variables	X^2	r	p-value
Level of education	43.335		0.001*
Sex	0.710		0.871
Household Size		0.907	0.989
Age		-0.120	0.145

S=significant at 1%; NS= not significant, X^2=Chi-square
Source: Field survey, 2018

CONCLUSION AND RECOMMENDATION

Based on the major findings of the study, it could be concluded that friends and families were most prominent source of information, while print media sources, such as poster, newspaper pamphlet were rarely used as channel of accessing information on integrated farming system. Secondly, main benefits associated with IFS included improvement in farmers' means of livelihood, increase in income and increase in yield of fish and rice. Thirdly, major constraints inhibiting practice of IFS were high cost of inputs, unavailability of the inputs, and inadequate knowledge about integrated farming system. From the foregoing, it is recommended that farmers should constitute themselves into cooperatives through which they can share knowledge and skills about integrated farming system and also facilitate joint purchase and use of inputs. Also, both NIFFR and extension organisation should increase the tempo of training for the farmers on integrated farming system.

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PERCEIVED EFFECT OF N-POWER SCHEME ON POVERTY REDUCTION AMONG GRADUATE YOUTHS IN KWARA STATE, NIGERIA

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ABSTRACT

This paper examined the effect of N-Power Scheme on poverty reduction in Kwara State. A Multi-stage sampling procedure was used to select two hundred and sixty-four (264) respondents across five (5) local government areas in Kwara State. Data were collected using structured questionnaire and analysed with descriptive statistics such as frequency counts, percentages and mean and Pearson product moment correlation. The mean age of the respondents was 28.5 years while 53% of them were males. The results revealed that N-power Teach ($\bar{x}$= 3.95), N-power Agro ($\bar{x}$ = 3.72), N-power Build ($\bar{x}$= 3.34), N-power Health ($\bar{x}$ = 3.31) and N-power Tech ($\bar{x}$ = 3.23) were the major activities of the scheme that contributed to poverty reduction in the study area. The major challenges encountered by beneficiaries were Late payment of stipends ($\bar{x}$= 3.07), Insufficient information ($\bar{x}$= 2.91), Short lifespan of the programme ($\bar{x}$ = 2.76), Political interference ($\bar{x}$ = 2.73), and Website and internet hiccups ($\bar{x}$ = 2.62). The study concluded that N-power scheme has contributed to poverty reduction in the study area. Reduced political interference will go a long way in ensuring the efficiency of the programme.

Keywords: Effect, Income, Graduate youths, N-Power scheme, Poverty reduction

INTRODUCTION

Nigeria is bequeathed with rich human and natural resources. Given this wealth in economic potentials, it is ironical that Nigeria is still rated as one of the poorest countries of the world, placed at 152 position out of 188 countries on Human Development Index ranking. Nigeria is suffering not only from poverty, income inequality, low income, unstable growth, but also from unemployment, economic and political instability, and poor investment (Ogbeide, *Nwamaka and Agu,* 2015). In Nigeria, the scale of economic inequality has reached an extreme level, in spite of the numerous government poverty alleviation programmes initiated since 1980s.

Nigeria is lagging behind the 2015 SDG target No. 1 set by the United Nations General Assembly which is to "eradicate extreme poverty and hunger" by 2030 (Kolawole and Omobitan, 2015). With poverty level at 67.1 percent and the enormity of the challenge, it is not surprising that the 2015 target of 21.4 percent poverty level was not met by Nigeria (Faloye and Bakare, 2015). The concern over increasing poverty levels in Nigeria and the need for its eradication has led to the conceptualization and implementation of various targeted and non-targeted poverty alleviation programmes. Unfortunately, the issue of poverty alleviation has proven to be the most difficult challenge facing the country with a large majority of the populace living in extreme poverty (Faloye and Bakare, 2015).

According to Kolawole and Omobitan (2015), poverty in Nigeria is a paradox. Paradox in sense that, poverty level in Nigeria contradicts the

country's abundant wealth of both human and natural resources. That is, there is poverty in the midst of plenty and inequality in the face of economic growth. However, in the pursuit to better the standard of living of Nigerians, several programmes were introduced and implemented at different periods by different administrations such as: Operation Feed the Nation of 1977 (OFN), the Green Revolution of 1980, Directorate of foods, Roads and Rural Infrastructure (DFFRI), the National Directorate for Employment (NDE), Poverty Alleviation Programmes (PAP), the National Poverty Eradication Programme (NAPEP), Agricultural Development Project (ADP) amongst many others. The major objective of these programmes amongst other things was to reduce and possibly eliminate poverty that has affected Nigeria's economy for decades and to reduce the inequality between the populace. In addition, effort has been committed by successive governments to bring about significant reduction in youth unemployment, subsequently leading to poverty reduction. One of such programmes is the N-power scheme initiated by the Buhari-led administration in 2016.

N-power is a National Social Investment Programme of the Federal Government aimed specifically at job creation and youth empowerment through human capital development. In essence, one of the objectives of the programme was to boost the human capital of the Nigerian labour force (N-Power Information Guide, 2017). The human capital boost appears to be in area of youth employment which was intended to be addressed through youth empowerment. Youth

empowerment was to be ensured through skill acquisition and development of youth in critical sectors such as education, health and agriculture. The core objective of the programme seems to hinge on skill acquisition and development of the Nigerian youth, both educated and non-educated, who had minimal hope of securing jobs, even at the minimum level needed to survive or raise a family (Okoro and Bassey, 2018; N-Power Information Guide 2017). In addition, the programme was designed to fill the unemployment gaps in the teaching profession in primary schools and to assist in taking basic education to children in remote areas, especially the marginalized communities. Furthermore, the programme was also created to provide manpower to primary health care centres in communities that appear to be under staffed while also providing manpower in the area of agricultural business (Okoro and Bassey, 2018).

Since the introduction of the N-power scheme by the Buhari-led administration in 2015, there is no independent empirical data to show the effect of the scheme in addressing youth unemployment and subsequently reducing poverty. More so, there have been serious claims on the part of government about the success of the scheme and media praises has rocked the airwaves, all without substantive investigative evidence backed by research. These claims cannot be substantiated without subjecting it to empirical research by assessing the extent of the programme. This study is therefore designed to bridge the knowledge gap by generating data that will support policy reforms and redirect the Federal Government on further programmes as well as improve the welfare of participants. It is against this background that this study was designed to specifically: examine the activities of N-power scheme towards poverty reduction, evaluate the influence of the scheme on beneficiaries' poverty reduction and the challenges encountered by the beneficiaries in the study area.

Hypothesis of the study was stated that there is no significant relationship between some selected socioeconomic characteristics of the respondents and poverty reduction of the beneficiaries.

METHODOLOGY

The study was carried out in Kwara State, Nigeria. Kwara State lies on latitudes 11^0 2| and 11^0 45|N, and longitude 20 45| and 60 4|E (NPC 2016). It covers a land area of about 32500km2. It is bounded in the north by Niger state, in the south by Oyo, Osun and Ekiti states and in the east by Kogi state. It also has an international boundary in the west with the Republic of Benin. The state has a population of about 3,192,900 (NPC, 2016) and sixteen LGAs. The state N-Power has about 13,154 beneficiaries cutting across the various section of the scheme (N-Power Information Guide 2017). A multi-stage sampling procedure was employed for the study. The first stage involved a random selection of five local government areas (Ilorin East, Offa, Irepodun, Baruten and Patigi) where N-power programme is in operation in Kwara State while the second stage also involved a random selection of four (4) communities from each of the five selected LGAs., making a total of twenty (20) communities. The third stage involves the use of systematic random sampling to select fifteen (15) beneficiaries from each of the selected communities. Thus, a total number of 300 beneficiaries were selected for the study. However, only Two hundred and Sixty-four (264) questionnaires representing 88% response rate was retrieved and used for the study. Primary data sources were used to obtain data from the respondents for the study. The primary data were gathered using structured questionnaire administered through personal interview. Descriptive statistics such as frequencies, percentages, and mean were used to analyse the socioeconomic characteristics of the beneficiaries. 3 and 5 points Likert-type scale was used to assess the constraints encountered by the beneficiaries, N-power activities and its influence on poverty reduction in the study area respectively. Pearson Product Moment Correlation was used to examine the relationship between the test variables and the generated hypothesis.

RESULTS AND DISCUSSION
Socioeconomic characteristics

The socioeconomic characteristics of the sampled beneficiaries was presented in Table 1. The average age of the beneficiaries of N-power scheme was 29 years and about 34% of the respondents were between the ages of 28 and 32. The study revealed that males (53%) were more involved in N-power scheme than females (47 %) in the study area and this implies that more males participated in the programme than their female counterpart. This affirmed the assertion of Akujuru and Enyioko (2019) that gender, cultural and religious considerations militates against the participation of females in key activities of N-Power Programmes. Also, most of the respondents (69%) were single with only 31% being married. This implies that there were more single beneficiaries than married ones. Also, the mean age of the beneficiaries being 28 years could also be attributed to the majority being single. The result also agrees with the work of Akujuru and Enyioko (2019) who also asserted that beneficiaries are not sufficiently empowered to face marital responsibilities.

Most (64%) of the respondents had household size between 1 and 3 persons. This is not surprising considering the fact that majority of the beneficiaries were graduate youths who may be

newly married and are still in their productive stage hence, the reason for the few number of persons in the household. Also, table 1 revealed that (38%) of the respondents have an annual income of between ₦200,000.00 and ₦299,000.00. This shows that the respondents have an average monthly and daily income of between ₦16,667.00 - ₦24,917.00 and ₦555.00 - ₦830.00 respectively. This amount is less than the United Nations recommendation of ₦1,350.00 on feeding per day (World Bank Group, 2015). This therefore means that most of the respondents live below the poverty line.

Table 1: Socioeconomic characteristics of respondents

Variable	Frequency	Percentage
Gender		
Male	141	53.0
Female	123	47.0
Age		
18 – 22	33	13.0
23 – 27	88	33.0
28 – 32	90	34.0
33 – 37	53	20.0
Marital Status		
Single	181	69.0
Married	83	31.0
Divorced	0	0.0
Widowed	0	0.0
Household Size		
1 – 3	169	64.0
4 – 6	85	32.0
7 – 9	10	4.0
10 and above	0	0.0
Annual Income (₦)		
Below 100,000.00	51	19.0
100,000.00 – 199,000.00	63	24.0
200,000.00 – 299,000.00	101	38.0
Above 300,000.00	49	19.0

Field Survey, 2019

Activities of N-power Scheme towards poverty reduction

The result in Table 2 showed the major activities of N-power scheme towards poverty reduction in the order of agreement as indicated by the information received. A large proportion of the respondents strongly agreed that activities such as 'N-power Teach (43.0%)', 'N-power Agro (35.0%)', 'N-power Build (21.0%)', 'N-power Health (31.0%)', and 'N-power Tech (21.0%)' were the major activities of the scheme that contributed to poverty reduction in the study area.

Table 2 further showed that 'N-power Creative (10.0%)', and 'N-power Tax (8.0%)' were N-power activities that did not significantly contribute to poverty reduction in the study area. The result revealed that the beneficiaries have benefitted maximally from the programme and had their living standard improved. The result in table 2 is therefore a pointer to the fact that each of the activities of N-power scheme has helped to reduce the level of poverty in the study area though at different levels. The programme therefore should be improved upon as it has the potential of bringing more youths in the study area out of poverty.

Table 2: Activities of N-power scheme towards poverty reduction

Activities of N-power Scheme	Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
N-power Tax	22	8.0	32	12.0	56	21.0	99	38.0	55	21.0
N-power Build	66	25.0	82	31.0	29	11.0	50	19.0	37	14.0
N-power Health	83	31.0	67	25.0	15	6.0	48	18.0	51	19.0
N-power Teach	114	43.0	92	35.0	9	3.0	29	11.0	29	11.0
N-power Tech	56	21.0	67	25.0	33	12.0	97	37.0	11	4.0
N-power Agro	93	35.0	86	33.0	32	12.0	23	9.0	30	11.0
N-power Creative	27	10.0	77	29.0	45	17.0	70	27.0	45	17.0

Source: Field Survey, 2019

Perceived Effect of N-power scheme on poverty reduction

Table 3 showed the perceived effect of N-power scheme on poverty reduction among beneficiaries in the study area. Majority of the respondents strongly agreed that the major effects of N-power on poverty reduction as perceived by them were "skill development (53.0%)", "increased income (53.0%)", "employment generation (50.0%)", "increase food availability (49.0%)" and "increased social interaction (43.0%)". The implication of the result is that the beneficiaries agreed that they have benefitted maximally from the different activities of the scheme and that the scheme has helped to bring about a significant reduction in their poverty levels. The result is consistent with the findings of Akujuru and Enyioko (2019) who stated that there exists a positive significant relationship between the scheme and the beneficiaries' economic well-being. In other words, the scheme has led to positive changes in standard of living of beneficiaries of the programme. Furthermore, Aderonmu (2017) pointed out that many government programmes designed to alleviate poverty has helped to reduce poverty but pointed out policy summersault as the causes of failure of such developmental programmes.

Table 3: Perceived Effect of N-power Scheme on poverty reduction of beneficiaries.

Perceived Effect of CCT Programme	Strongly Agree		Agree		Undecided		Disagree		Strongly Disagree	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Increase income	141	53.0	101	38.0	10	4.0	12	5.0	-	-
Increase social interaction	112	43.0	99	37.0	-	-	40	15.0	12	5.0
Increase food availability	129	49.0	92	35.0	26	10.0	10	4.0	7	3.0
Increase conflict	28	11.0	39	15.0	19	7.0	99	37.0	79	30.0
Skill development	139	53.0	99	37.0	20	8.0	11	4.0	-	-
Improve savings	80	30.0	92	35.0	28	11.0	34	13.0	30	12.0
Employment generation	131	50.0	99	37.0	20	8.0	11	4.0	-	-
Improve access to medical facilities	53	20.0	68	26.0	39	15.0	44	17.0	60	23.0
Increase of own productive asset	60	23.0	53	20.0	40	15.0	57	22.0	54	20.0

Source: Field Survey, 2019

Challenges encountered by beneficiaries of N-power scheme

Table 4 showed the challenges the beneficiaries encounter in their participation in N-power scheme. The major challenges faced by respondents in participating in N-Power scheme include late payment of stipends ($\bar{x}$ = 3.07), insufficient information ($\bar{x}$ = 2.91), short lifespan of the programme ($\bar{x}$ = 2.76), political interference ($\bar{x}$ = 2.73) and website and internet hiccups ($\bar{x}$ = 2.62). Sometimes, beneficiaries do not get to receive their stipend until after three months. During this time, beneficiaries are not encouraged to go to their place of posting or discharge their duties effectively and efficiently. This thus pose a serious challenge to the smooth running of the scheme. Also, the programme has a life span of two years and so, after the first year, beneficiaries tend to be lackadaisical in their attitude to work as they begin to look elsewhere for a more permanent job offer. The result is similar to the findings of Akujuru and Enyioko (2019) who reported non-payment of stipends to participants as at when due, high transportation paid by beneficiaries to work, insufficient information, wrong bank verification number and overbearing hands of politicians in the programme as major problems affecting N-power scheme in alleviating poverty in Rivers State, Nigeria. In similar vein, Ike and Uzokwe (2011) asserted nonchalant attitude of government officers, inconsistency in government policies and untimely release of funds as the major constraints militating against participation in government developmental programmes in Nigeria.

Test of hypothesis

Table 5 revealed that the correlation coefficient is 0.384. This signifies that there is a positive and significant relationship between respondent's age and the effect of N-power scheme on poverty reduction in the study area (p=0.0001, p-value 0.005). This is expected considering the fact that majority of the beneficiaries of the scheme are young and unmarried and so, had lesser responsibilities when compared to those who are married and advanced in age. Furthermore, table 5 showed that there is a positive and significant relationship between the respondents' Gender and the effect of the scheme on poverty reduction among beneficiaries (p=0.001, r=0.381). Similar result was obtained for household size (p = 0.001, r = 0.348) thus the null hypothesis is rejected. The smaller the household size, the lesser the responsibilities beneficiaries have to cater for hence, the effect of the scheme. The result is consistent with Akujuru and Enyioko (2019) who also pointed out that a positive relationship existed between N-power activities and poverty reduction in Rivers State, Nigeria.

Table 4: Challenges encountered by beneficiaries of N-power Scheme

Challenges	Very Severe	Severe	Less Severe	Not Severe	Score Point	Mean
Non-payment of some beneficiaries	51	60	100	53	636	2.41
Wrong bank verification number	61	38	98	67	620	2.35
Insufficient information	88	121	19	36	768	2.91
Being posted to long distance	29	49	100	86	549	2.08
Inability to do inter-state transfer	59	64	80	61	649	2.46
Short life span of the programme	81	93	36	54	729`	2.76
Late payment of stipends	110	102	13	39	810	3.07
Website and internet hiccups	67	64	99	34	692	2.62
Political interference	94	68	39	63	721	2.73

Source: Field Survey, 2019

Table 5: The relationship between selected socioeconomic characteristics of respondents and the effect of the scheme on reducing poverty level of beneficiaries'

Variable	N	X	SD	R	P	Decision
Age	264	1.18	0.39	0.384	0.001	Rejected
Gender	264	1.71	0.49	0.348	0.001	Rejected
Household size	264	1.99	0.78	0.306	0.022	Rejected

**Correlation is significant at the 0.01 level (2-tailed),
*Correlation is significant at the 0.05 level (2-tailed)

CONCLUSION AND RECOMMENDATIONS

Based on the findings of this study, it was concluded that N-power scheme has contributed to poverty reduction hence improved livelihood condition in the area. The scheme has helped in skill development, increased beneficiaries' income, employment generation, increased food availability amongst many others. Notable among the challenges encountered by the beneficiaries are: late payment of stipends; insufficient information; short life span of the scheme; political interference as well as website and internet hiccups. In lieu of these, the following recommendations were made:

i. Considering the short life span of the scheme, government should look at the possibility of engaging and absorbing outstanding beneficiaries into the civil service either at state or federal level. This will encourage hard work and enhance effective participation in the scheme.

ii. Effort should be made by the Federal government to reduce political interference in the scheme. This will go a long way in ensuring that the right set of people benefits from the scheme.

iii. It is pertinent for government to promote rural development through N-Power programmes. This is because rural development is seen as the key for poverty alleviation of the rural dwellers that constitute the large portion of the nation's population.

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INFLUENCE OF LEADERSHIP CHARACTERISTICS ON ROLE PERFORMANCE OF LOCAL LEADERS IN RURAL COMMUNITY DEVELOPMENT IN SOUTHWESTERN NIGERIA

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ABSTRACT

This study investigated the influence of leadership characteristics on role performance of local leaders in Rural Community Development (RCD) in Southwestern Nigeria. It described the leadership characteristics of local leaders, determined role performance of local leaders in RCD and determined the influence of leadership characteristics on role performance. Multistage sampling procedure was used to select 352 local leaders drawn across the study area. Quantitative data were collected through structured interview schedule while in-depth interview guide was used to elicit qualitative information. Data were analysed using frequency counts, percentages, means and multiple linear regression analysis. Results indicated that majority (81.4%) of the respondents had empathy, emotional stability (89.7%) and delegated leadership roles to their members (82.7%). Roles performed by local leaders were protecting members' welfare (mean = 2.42) and community mobilization (mean = 2.28). Findings revealed that empathy (β=0.355), emotional stability (β = 0.183), ability to delegate leadership roles (β=0.143), good communication skills (β = 0.165) and consistency in decision making (β = 0.567) significantly contributed to role performance of local leaders in RCD. The study concluded that emotional stability, good communication skills and consistency in decision making were leadership characteristics that determined local leaders' role performance. Significant leadership characteristics should be enhanced to ensure effective performance of local leaders in RCD.

Keywords: Leadership characteristics, Local leaders, Leadership selection, Role performance, Rural community development

INTRODUCTION

Community development has been one of the concerns of many governments, non-governmental organisations, agricultural and rural development agencies. The process of improving the general well-being of the community people through their active participation in community development activities is known as community development. It involves continual improvement by the people themselves which is usually driven by its power structure to bring about change in their lives (Rahim and Asnarulkhadi, 2010). The ultimate goal of community development is to develop members' capabilities and the potential to affect their well-being and quality of life through effective management of community development programmes as well as having highly committed and enthusiastic leadership. Emeka (2012) asserted that one of the approaches in creating sustainable rural development is by giving the main actors opportunities to think and plan their own future. This underpins the need for effective leadership at the local community levels in order to harness the efforts of the rural people towards their own development. When good leadership is provided, the people participate voluntarily in the accomplishment of stated objectives. The best approach to rural development is always through local leaders who not only act as legitimiser of projects but also help in influencing, encouraging and motivating their people to action (Emeka, 2012).

Local leaders are individuals saddled with the responsibilities of leadership in locality or a social system. These people direct or influence the behaviour and action of other people towards achieving group or community goals. They are one of the major key players in Nigerian rural development programmes. In fact, the success of any development projects has been attributed to effective leadership at the local level who mobilise followers to actively participate in such projects/programmes (Hagberg, 2006). In the same vein, development can only be sustained over a long-term if these leaders are motivated and committed to keeping the momentum going. They are role models in the community as other rural dwellers look up to them for advice, consultation and others tend to imitate them (Mgbada and Agumagu, 2007). They are usually sociable, generally interested in solving community's problems when necessary. They are people with high integrity and repute within their community. These groups of people are usually expected to be sincere and trustworthy and trusted by their community members (Donye, 2017, Ekong, 2010 and Jibowo, 2000).

Many scholars such as Donye (2017), Echetama *et al.,* (2017), Baba *et al.,* (2014), Akwa and Kpalo, (2013), Mgbada and Agumagu, (2007) and Oladosu, (2000) have established important roles played by these leaders in rural community development such as pioneers of development projects; making decisions on different issues affecting the community; playing influential roles in sourcing for project funds; resource linkers among others. But these efforts cannot be achieved without possessing certain leadership attributes or qualities such as empathy, consideration, emotional stability, honesty, ability to delegate leadership

roles among others(Ekong 2010 and Jibowo 2000). Fisher (2005) and Schultz (2004) had earlier found that the personal and socioeconomic characteristics of local leaders had a significant effect on the community development effort. Oladosu (2000) and Okunade (2002) also reported that age, marital status, farming experience, origin of respondents, length of residence, level of education and participation in social organisation contributed significantly to the effectiveness and participation of contact farmers and community leaders in agricultural and rural development programmes. However, there is still dearth of information on the influence of leadership characteristics on role performance of local leaders in rural community development, hence the need for this study.

The main objective of this study was to determine the influence of leadership characteristics on role performance of local leaders in rural community development in Southwestern Nigeria. The specific objectives were to:

i. describe the leadership characteristics of local leaders in the study;
ii. determine role performance of local leaders in RCD; and
iii. determine the influence of leadership characteristics of local leaders on role performance in RCD in the study area.

METHODOLOGY

The study was conducted in Southwestern Nigeria which comprises Osun, Oyo, Ogun, Lagos, Ekiti and Ondo States. Multistage sampling procedure was used to select the respondents (community leaders). At the first stage, Osun, Ondo and Ekiti States were purposively selected due to high prevalence of rural communities in these States compare to other States in the study area. At the second stage, one rural Local Government Area (LGA) was randomly selected from each of the three Senatorial Districts in each State, making a total of nine LGAs in all. At the third stage, 5 percent of all the communities in the selected LGAs were selected to make a total of 44 rural communities. At the final stage, a total of 352 local leaders were proportionately selected based on the numbers of local leaders in each of the selected rural communities. Duly pretested and validated interview schedule was used to collect the quantitative data from the respondents while qualitative data was elicited through Key Informant Interview sessions.

Role performance was measured by asking the community leaders to indicate the extent to which they perform their expected roles in rural development activities. Their responses were rated on a 4 point rating scale ranging from never performed (0 point), rarely performed (1point), occasionally performed (2 points) and always performed (3 points). The total scores of each respondent were calculated as role performance score. These scores were added to obtain a value of 6 which was divided by 4 to get a benchmark of 1.5. Any role with mean score $\geq$ 1.5 was regarded as major role performed by the respondents while any role with mean score < 1.5 was regarded as minor role performed. Leadership characteristics were measured using characteristics employed by Okunade (2002) and Siyanbola (1991) and later modified. These qualities include empathy, consideration, emotional stability, competence, communication skill, group membership, surgency and ability to delegate leadership roles. *Empathy* was measured by asking respondents to indicate areas where they had identified with their members before and each response was scored one point. *Emotional stability* was measured by asking respondents to indicate what would be their response if one of their members insults or infuriates them in the course of a meeting, and scored accordingly: get annoyed and insult him back (0 point), walk out of the meeting (1 point), and patient and continue the meeting (2 points). For *consideration,* respondents were asked to indicate who first benefited from poverty reduction programme they had participated in before and scored as follows: myself only (0 point), my family members only (1 point) and all community members (2 points). *Surgency:* Respondents were asked how often they discuss with any member or other organisations about how their communities can be developed in the last two years and their responses were scored as follows: often (2 points), rarely (1 point) and never (0 point). *Dispute/conflict management:* respondents were asked how often they had managed disputes among their members successfully and scored as often (2 points), rarely (1 point) and never (0 point). *Ability to delegate leadership role:* Respondents were asked to indicate roles they had delegated before to their members to perform to avoid delay of activities and each was scored one point. *Consistency*: Respondents were asked the extent of changing decisions made at meeting without consulting other members and scored: frequently (0 point), rarely (1 point) and never (2 points). *Group membership:* Respondents were asked to indicate their perception about themselves in relating with other members of the community/group they lead and scored as: I am the leader and above others (1 point) and I am not significantly different from other members (2 points). *Communication skill* was measured by asking the respondents to indicate how easy for them in conveying their ideas and thoughts to their members without any misunderstanding of the message using 3 points scale ranging from very easy (2 points), easy (1 point) and not easy (0 point). Frequency counts, percentages, means and standard deviation were used to summarize the data collected. Multiple

linear regression analysis was used to determine the influence of leadership characteristics on role performance.

RESULTS AND DISCUSSION
Leadership characteristics

Results in Table 1 show that respondents empathized with their members through visiting and caring for sick members (92.9%), giving financial assistance and participating in social functions of their members (90.5%), commiserating with bereaved members (75.9%), raising funds for poor members (73.6%) and among others. This implies that majority of the local leaders empathized with their members by identifying with their members' problems. It is when leaders empathize with their members that they can appreciate their problems; sensitive to their needs and ready to meet these needs. This finding is contrary to the position of Ofoku and Agbamu (2013) who reported that leaders of farmers' self-help groups in agricultural production did not show empathy but aligned with the submissions of Ekong (2010) and Jibowo (2000) who asserted that local leaders must have empathy. This implies that local leaders believed that welfare of their members is very paramount to them and ready to assist them to any level. As regards emotional stability, majority (89.7%) of the respondents preferred to be patient with members and conclude the meeting if one of their members behaves in an unruly manner to them in the course of the meeting and very few (4.3%) indicated that they would walk out of the meeting in case any member of their group insult them. The result implies that majority of the local leaders are the patient types who are also tolerant to elastic limit. They realized the need to be emotionally stable that is, they know how to respond to situation. Their understanding that community members are made up of different people from different homes and backgrounds would help them to realise that they would behave differently. This finding support the submissions of Jibowo (2000) and Sapkota (2010) who noted that leaders must be emotionally stable but disagree with the position of Ofoku and Agbamu (2013) who reported that leaders of farmers' self-help groups in their study area were not emotionally stable. Majority (79.3%) of the respondents indicated that they would make sure all members would first benefit from any assistance from government and few (13.6%) claimed only their family members or close relatives would benefit first from such assistance. This implies that majority of the respondents were selfless and considerate, that is, they understand the need to serve the purpose of their members before themselves. This would assist their members to trust them and enhance their credibility. This finding conforms to the submissions of Deckor and Nnodim (2002) and Jibowo (2000) who stated that a good leader must be selfless and considerate.

Results on surgency shows that majority (81.5%) of the respondents claimed they often discussed how to develop their communities/groups with other people and government to assist them in the development of their communities. This implies possessing this leadership quality would assist the leaders to act as liaison between the government and NGO for assistance and also assist them to act as community spokesman. Majority (83.4%) of the local leaders indicated that they often settled different conflicts/disputes amicably among their members without resulting into violence. This implies respondents possess good ability in resolving conflicts. This would ensure cordial relationship and peaceful co-existence among the community members which would eventually bring development into their communities. This attests to what Pkalya et al., (2004) observed that local leaders possessed local mediation ability. This is because local leaders are held in high esteem and accepted as men and women of wisdom with impeccable characters whose pre-occupation is to see to the peaceful co-existence among their members. As regards ability to delegate roles, majority of local leaders claimed they had one time or the other delegated the following roles to their members as occasions demand to avoid delay: supervise community projects (82.7%), mobilise other community members (82.1%), represent them in community engagement (75%) among others. This implies their absence in the communities would not mean stagnation of rural development efforts in their communities. Hence, ability to delegate leadership role would increase the effectiveness of a leader; prevent over tasking a particular leader and ensures continuity in role performance. Results in Table 1 reveal that almost two-third (63.4%) of the local leaders claimed that they never change a community decision without consulting with other community members. Some (33.8%) of the leaders claimed that they rarely a changed community decision reached at the meeting without proper consultation with members. The result shows that majority of the leaders were consistent to the community decision on issues affecting their communities by following agreed upon decision. The implication is that leaders would gain respect and credibility of their members and this would make them to be trusted and dependable without questioning their authority on any action taken by them. Also, majority (74.7%) of the respondents considered themselves as members of the group and not significantly different from other members of the community while 21 percent considered themselves as leaders who are above others. This result indicates that many of the leaders were humble and value group identity despite their leadership positions. Majority

(86.4%) of these leaders indicated that they easily convey their ideas and thoughts to their members on important group/community decisions without misinterpretation while few (13.6%) indicated that they had difficulty in conveying such information. This implies that many of the leaders possessed good communication skills. Good communication skills are probably the most important factor in an effective group leader. Without it, problems go unresolved in the group and a leader with good communication skills is able to offer a viable or satisfactory solution if problems exist among group members there is any problem among the members of the group.

Table 1: Distribution of respondents according to selected leadership characteristics (n=352)

Leadership characteristics	Frequency	Percentage
*Empathy		
Visited sick members and gave financial assistance	327	92.9
Participated in social functions of their members	320	90.4
Commiserate with family of bereaved members of the community	267	75.9
Raised funds for poor members of the community	253	73.6
Source land for members who are in land for farming	255	72.4
Emotional stability(reaction to unruly behaviour)		
Get annoyed and insult him	21	6.0
Walk out of the meeting	15	4.3
Be patient and continue the meeting	316	89.7
Consideration		
Myself alone would benefit	25	7.1
My family members alone would benefit	48	13.6
All community members would benefit	279	79.3
Surgency		
Never discuss it with other and government	3	0.9
Rarely discuss with others and government	62	17.6
Always discuss with others and government	282	81.5
Dispute management		
Never	44	12.5
Rarely	14	4.1
Often	294	83.4
***Ability to delegate leadership roles**		
Represent community members in community engagement	264	75.0
Supervise community projects	291	82.7
Mobilise community members to participate in project	289	82.1
Settle minor conflict	181	51.4
Consistency		
I often change decision reached at the meetings without consulting the community	10	2.8
I rarely change decision reached at meetings without consulting the community	119	33.8
I never change decision reached at meetings without consulting the community	223	63.4
Group membership		
I am the leader and am superior to other members	73	20.7
I am only bounded by some rules	16	4.5
I am not significantly different from other members	263	74.7
Communication skill/ability		
Not easy	48	13.6
Easy	279	79.3
Very easy	25	7.1

* Multiple responses
Source: Field survey, 2017

Roles performance of local leaders

Result in Table 2 reveals that ensuring cordial relationship among people (mean=2.45) was the foremost among the roles performed by local leaders in RCD; Protecting the welfare of the members (mean=2.42), mobilizing community members for RCDPs (mean = 2.28), ensuring all assistance reach the targeted people (mean=2.25), participating in planning and execution of RCDPs (mean=2.22), contributing resources and organising

meeting for fund raising for RCDPs (mean=2.21), supervising and coordinating RCDPs (mean=2.16) and legitimising RCDPs (mean = 2.09) were major roles performed by the local leaders in RCD. On the other hand, awakening political consciousness among community members (mean = 1.42), ensuring conformity to community norms and values (mean = 1.41) and punishing unacceptable behaviour or ostracising erring members of the community (0.91) were minor roles performed by local leaders with mean scores below the benchmark of 1.5. This finding is line with that of Donye (2017), Echetama *et al.,* (2017), Baba *et al.,* (2014) and Akwa and Kpalo, (2013) who established that local leaders performed important roles in rural development in Nigeria.

Below KII excerpts conducted further strengthened the quantitative findings on roles performed by local leaders in rural community development:

As a leader, on many occasions I have liaised with people in authority to assist our community in providing social amenities and development projects; called meetings to sensitise members of new projects initiated by government and ensure the welfare of my community member.
(KII excerpt from a local leader from Bamikemo community in Ileoluji/ Oke-Igbo LGA, Ondo State)

Whenever any new developmental programme gets into the community, I make announcement about it and give support to the programme; encourage others to participate fully in it and ensure people to live peacefully in the community without any rancor and bitterness through peaceful reconciliation of dispute that arises among community.
(KII excerpt from a local leader from Ikoro *Ekiti* in Ijero LGA, Ekiti State)
I have taken some decisions on behalf of the community to solve urgent problems like locating the site for borehole donated by UNDP and mobilise members for CDPs.
(KII excerpt from a local leader from Ode-Omu in Ayedaade LGA, Osun State)

Results from both qualitative and quantitative information show that majority of the local leaders demonstrated much enthusiasm and commitment to support the development of their various communities. This was exhibited through their efforts in ensuring peaceful and cordial relationship, protecting members' welfare, mobilizing their members to development programmes, giving support for projects and also diffusing useful information to their members.

Table 2: Distribution of respondents by role performance in rural community development activities (n=352)

Roles played by local leaders	Ranked mean	Standard dev.
Ensuring cordial relationship among people	2.45	0.67
Protecting the welfare of the community members	2.42	0.90
Community mobilization	2.28	0.88
Ensuring all assistance reach the targeted people	2.25	1.00
Participating in planning and execution of RCDPs	2.22	1.02
Contribution of resources and organising meeting for fund raising to RCDPs	2.21	0.91
Diffusing information and educating rural people	2.20	0.89
Supervision and coordination of all RCDPs	2.16	0.94
Legitimsing RCDPs	2.09	1.00
Liaising with government and NGOs for assistance	2.01	1.09
Dispute settlement	1.76	1.20
Conceiving and selling ideas on RCD	1.73	1.20
Awakening political consciousness	1.42	1.29
Ensuring conformity to community norms.	1.41	1.18
Ostracizing / punishing erring members	0.91	0.96

Source: Field survey, 2017

Influence of leadership characteristics

The results in Table 3 show that empathy (t = 3.188; p ≤ 0.01), emotional stability (t=3.357; p ≤ 0.01), ability to delegate leadership roles (t = 2.616; p ≤ 0.05), consistency in decision making (t = 8.816; p ≤ 0.01) and good communication skills (t=3.439; p ≤ 0.01) were significant predictors of role performance of local leaders in RCD. In terms of relative importance of each of the independent variables on role performance as measured by the Beta Coefficient, consistency in decision making (β=0.564) is the most important leadership characteristics of influence in predicting the role performance of local leaders in RCD; hence, the

higher the consistency of local leaders in decision making, the higher the probability of performing their roles in RDAs. This was followed by empathy (β=0.357), emotional stability (β=0.183), good communication skill (β=0.165) and lastly ability to delegate leadership roles (β=0.143). The implication of this finding is that possession of these significant attributes (consistency, empathy, emotional stability, ability to delegate leadership roles and communication skill) by local leaders would determine their performance in RCD. Furthermore, overall regression model summary show that R^2 value of 0.549 was obtained in the analysis. Also F value of 10.234 obtained was significant at $p \leq 0.01$. The R^2 of 0.549 indicates that significant variables in leadership characteristics could only explain about 54.9 percent of the variation in role performance of local leaders in RCD.

Results of regression analysis between leadership characteristics of respondents and role performance (n=352)

Leadership characteristics	Standardized coefficient (b)	regressionT-value	P-value
Empathy	0.357	3.188**	0.002
Emotional stability	0.183	3.520**	0.000
Consideration	0.036	1.253	0.211
Surgency	-0.078	-0.688	0.492
Dispute/conflict management	-0.040	-0.778	0.110
Group membership	-0.135	0.799	0.250
Ability to delegate leadership roles	0.143	2.616*	0.039
Consistency in decision making	0.564	8.816**	0.000
Communication ability	0.165	3.439*	0.011

**Significant at $p \leq 0.01$; * Significant at $p \leq 0.05$ Model summary: F = 10.234; sig = 0.000; R^2 = 0.549, R = 0.741 Source: Field survey, 2017

CONCLUSION AND RECOMMENDATION

The study reveals that majority of the respondents were consistent in decision making, empathized with their members, had emotional stability and delegated leadership roles to their members. Major roles performed by local leaders in RCD were ensuring cordial and peaceful co-existence among members, protecting members' welfare and community mobilization of members to participate in RCDPs. The study concluded that consistency in decision making; emotional stability, ability to delegate leadership roles, good communication skills and empathy were leadership characteristics that determined local leaders' role performance. Hence, the study recommended that significant leadership characteristics should be enhanced through organising training and workshops for local leaders to ensure effective role performance in RCD.

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FACTORS INFLUENCING RURAL DWELLERS' INVOLVEMENT IN ELECTORAL PROCESS IN OGUN STATE, NIGERIA

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ABSTRACT

Voters' apathy has been a serious issue on all elections conducted in Nigeria, particularly in the rural areas. The study assessed factors influencing rural dwellers' involvement in electoral process in Ogun state. Multistage sampling procedure was used in selecting 150 respondents for the study. Data were collected through the use of interview schedule and analysed using descriptive and inferential statistics. Findings revealed that 63.3% of the respondents had high knowledge of electoral process, 53.3% had unfavourable attitude towards electoral process and 56.0% had low level of involvement in electoral process. Inadequate security at voting centers ($\bar{x}$ = 1.49) and difficulty in registering for Permanent Voters' Card ($\bar{x}$= 1.37) were considered severe constraints facing respondents' involvement. There was a significant relationship between respondents' primary occupation (χ^2=38.26, p=0.000, educational level (χ^2=39.28, p=0.000) and membership of groups (χ^2=45.47, p=0.000) with level of involvement in electoral process. There was also a significant relationship between knowledge of electoral process (r =0.40, p=0.000), constraints to involvement (r = -0.66, p = 0.000), monthly income (r =0.47, p=0.000) and attitude towards electoral process (r = 0.29, p = 0.000) with level of involvement in electoral process. The major factors influencing respondents' involvement in electoral process were primary occupation, monthly income, knowledge of electoral process and constraints. The study recommended recruitment of community police to augment Federal police to curb electoral violence and more card reading machines and staff should be employed to reduce the long time spent at polling centres.

Keywords: Electoral process, Voters' involvement, Electoral violence, PVC registration

INTRODUCTION

Rural areas are vital sector of every nation's economy. The rapid development and modernization of the rural areas have gained the attention of policy makers and governments all over the world. According to the National Population Commission, Nigeria and ICF Macro (2009), approximately 64 percent of the population lives in rural areas. Similarly, the rural areas are regarded as the most important sector of the Nigeria population because the rural sector is the major source of capital formation for the country and the principal market for domestic and raw materials for industrial processes (Ugwanyi and Chukwuemeka, 2013). Typically, rural dwellers are less vocal and characterized by a culture of poverty as most people live barely above subsistence level. Laah, Abba, Ishaya and Gana (2013), stated that rural areas are usually deprived of basic needs of life such as housing, medical care, postal communication, education, transport etc. Given the importance of rural sector to the country's economy, enhancing the development of the sector should be taken serious by government and public administration.

Cheema and Maguire (2004) opined that development is not sustainable without transparent and accountable institutions (i.e. electoral bodies and government), national and local capacity to formulate people oriented policies and legal and regulatory framework. In order for development to be realised at all level of life (socially, economically, and politically), rural communities needs responsible and accountable leaders that are elected in a democratic way through a free and fair election.

Meanwhile, electoral process provides citizen with the opportunity to decide those who will represent them at the local, state and national level. Therefore, it is paramount that all eligible voters should participate in all electoral processes, from voter's registration to voting proper. This will ensure proper representation in the helms of government and ensuring that our democracy is viable and meaningful. However, it is quite ironical that elections in Nigeria, over the years till the last general election have been marred with high level of voters' apathy with the inclusion of rural areas. Rural voter apathy goes beyond just lack of interest or passivity of voters towards voting, it is the insensitivity of voters to electoral processes, particularly voting caused by disenchantment arising from dissatisfaction with the political system and sometimes ignorance and lack of proper education. Rural voter apathy thus, results in low voter turnouts. As a result, lack of voting or representativeness in governance from a particular community leading to a low public service delivery in such community, which will in turn limit development in such community.

Broadly, Vergne (2009) and Amdi (2014) have identified some factors that affect political participation and voter turnout. Vergne (2009) holds that, the expected benefit of voting depends on some variables such as the policy packages that the electorates prefer to be carried out and the parties or leaders they prefer to be in governance. Amdi (2014) identifies the institutional arrangement of the Nigerian state as a major factor

for low voter turnout. He maintains that, the democratic process and political participation in Nigeria is a learning one and this is so because, the democratic structures and institutions are very fragile and coupled with low level of democratic culture of the citizens resulting from long years of military dictatorship. These fragile democratic structures have affected the political processes thereby, reducing the measure of confidence in the political process by the citizens.

In a country supposedly run by elected officials, disenchanted and inactive citizens can present a problem. This is because, when very few people vote at elections, the elected persons do not necessarily represent the beliefs and values of the general population. Fewer voters at the polls lessen the impact of the popular vote and strengthen the impact of special interest groups. Various causes of apathy have been identified over the years with little or no effort to tackle it. With this, Nigerians should be more involved in the selection of their leaders by participating in electoral process and ensuring that politicians are been put on their toes to perform as expected. The independent electoral commission saddled with the responsibility of ensuring credible free and fair elections, embarked on various voter education campaign to educate the voters on how to go about the electoral process, with little improvement on voters turn out been recorded, particularly in rural areas. Voter apathy remains one of the central problems in Nigeria politics and election as the values of democracy keep eroding conspicuously with its effect on rural development increasingly visible. This underscores the need to investigate the factors influencing rural dwellers involvement in electoral process.

The main objective of this study is to identify the factors influencing rural dwellers' involvement in electoral process. The specific objectives are to:

1. determine rural dwellers' level of knowledge of electoral process,
2. investigate the attitude of rural dwellers toward electoral process,
3. determine the level of involvement of rural dwellers in electoral process and
4. identify the constraints faced by rural dwellers in involvement in electoral process in the study area.

The study hypothesized that there is no significant relationship between socioeconomic characteristics, attitude of rural dwellers, knowledge on electoral process, constraints and their involvement in electoral process.

METHODOLOGY

The study was conducted in Ogun State because of high prevalence of voter apathy reported in the state particularly at the rural areas. Ogun is a state in Southwestern, Nigeria. It has borders with Lagos state to the south, Oyo and Osun states to the north, Ondo state to the east and the Republic of Benin to the west. Abeokuta is the capital and the largest city in the state. The 2006 census recorded a total population of 3,751,140 residents, predominantly a homogenous group of Yoruba extraction. Agriculture is the economic mainstay of the state. The population of the study includes all eligible voters in rural areas of Ogun state who are 18 years and above. Multi-stage sampling procedure was used in selecting respondents for the study. The first stage involved the categorisation of rural and urban Local Government Areas. The second stage was the use of simple random sampling technique to select two local government areas based on their rurality. The third stage was purposive selection of 5 wards with the lowest registration from each of the selected local Government Areas. The fourth stage was random selection of 15 eligible voters from the list of registered voters collected from INEC in each ward to give a total of 150 respondents.

Data was collected with the use of structured questionnaire and interview schedule. Respondent's level of knowledge of electoral process was measured with 14 questions. Correct response attracted score of one while wrong response was assigned score of 0. The mean value was determined and use to categorise respondents into high (value $\geq$ mean) or low (value < mean) level of knowledge on electoral process. The respondents' attitude towards voting was measured on a five point likert type scale of strongly agree (5), agree (4), undecided (3), disagree (2) and strongly disagree (1) for positive statement and the reverse was used for negative statements. The mean value was calculated and used to categorise respondents into having favourable (values $\geq$ mean) or unfavourable (value < mean) attitude toward involvement in electoral process. Respondent's level of involvement in electoral process was measured on three point scale of always, occasion and never with scores 2, 1 and 0 respectively. The mean value was determined and used to categorise respondents into high (values $\geq$ mean) or low (value < mean) level of involvement in electoral process. Constraints were measured on a three point scale of severe constraint (2), mild constraint (1) and not a constraint (0). The weighted mean was calculated and used to rank the constraints based on level of severity.

RESULT AND DISCUSSION

Results in Table 1 reveals that most of the respondents (64.7%) were within the age brackets of 31-60 years, 28.0% were 61 years and above with mean age of 50.76 ± 13.96 years. This implies that most of the voters in the study area were elderly, so they are expected to have participated in not less than two elections. This is quite similar to

result of Adeleke (2016) who reported the mean age of election participants to be 52.7 ± 16.98 years. The distribution of the respondents based on sex revealed that 51.3% of the respondents were male while 48.7% were female. This indicated that more males were involved in electoral process than females. This could be that the electoral process favours the participation of male more than their female counterparts. This is in consonance with the findings of Ogbogu (2012) and Nwanna (2014) that reported more male involvement in political activities than females. Table 1 also shows that more than half (55.3%) of the respondents were married. The reason for this could be that the couples encouraged each other to participate in electoral process.

Table 1: Distribution of respondents by socioeconomic characteristics   n = 150

Variables	Frequency	Percentage	Parameter
Age			
≤ 30 years	11	7.3	Mean = 50.76
31 – 60 years	97	64.7	S.D = 13.96
≥ 61 years	42	28.0	
Sex			
Male	77	51.3	
Female	73	48.7	Mode = Male
Marital status			
Single	17	11.3	
Married	83	55.3	
Divorced	12	8.0	
Separated	4	2.7	
Widowed	34	22.7	
Educational level			
No formal education	34	22.7	
Primary education	49	32.7	
Secondary education	38	25.3	
Tertiary education	29	19.3	
Household size			
1 - 5 people	63	42.0	Mean = 6.35
6 - 10 people	72	48.0	S.D = 2.95
≥ 11 people	15	10.0	
Primary Occupation			
Farming	47	31.7	
Trading	51	34.0	
Civil service	11	8.6	
Artisan	24	16.0	
Clergy	1	0.7	
Politician	3	2.0	
Student	7	4.7	
Engineer	3	2.0	
Legal Practitioner	1	0.7	
Membership of a group			
Political group	25	16.7	
Social group	18	12.0	
Religious group	19	12.7	
Professional group	1	0.7	
None	87	58.0	
Monthly Income			
<N 25,000	103	68.7	
N 25,000 - N 50,000	39	26.0	Mean = N23,233.33
>N 50,000	8	5.3	S.D = N29,174.186

Source: Field Survey, 2018

The respondents' level of education shows that 32.7% had primary education, 25.3% had secondary education, 22.7% had no formal education while the remaining 19.3% had tertiary education. This shows that the rural dwellers have one form of education or the other; hence they may be knowledgeable on the electoral processes and possibly be involved in the processes. Edegoh,

Ezeh and Anunike (2015) reported a high number of electorates who had primary school education. The result in table 1 reveals that less than half (48.0%) of the respondents had a family size of 6-10 people with a mean family size of 6.35 ± 2.95 people. Availability of family labour to assist in the household livelihood activities could possibly be the reasons for the large household size in the study area. This could also influence their level of involvement since they have higher expectations from the government to meet their household needs. The result also indicates that 34.0% of the respondents were traders, 31.7% were farmers, 16.0% were artisans and remaining were paid workers. This finding agrees with findings of Edegoh *et.al,* (2015) that most election participants were farmers and traders.

Table 1 also reveals that more than half (58.0%) of the respondents do not belong to any group. It can be inferred that since most of the respondents do not belong to any group, membership of a group may not necessarily influence their level of involvement in electoral process. With regard to the income of the respondents more than half (68.7%) of the

respondents earned below ₦25,000 monthly and mean income per month of N23,233.33 ± N29,174.19. This suggests that the respondents may not effectively participate in electoral process because of their low incomes which may serve as a barrier to pay transport to registration and PVC collection centres.

Level of knowledge of electoral process

Results in Table 2 reveals that all the respondents were knowledgeable that registration is a prerequisite to voting (100%) and that only INEC can declare result of an election (100%). However, majority were not knowledgeable that vote buying (14%) is not required while physical voting is a requirement in voting process (20.7%). In addition, the categorisation of respondents in Table 3, based on their knowledge on electoral process reveals that 63.3% of the respondents had high knowledge of electoral process while the remaining 36.7% had low knowledge of electoral process. This result was similar to the findings of Ajibade, Ocheni, Mabe and Adekunle (2012) that majority of individuals had knowledge of electoral processes and the political happenings around them.

Table 2: Distribution of respondents by level of knowledge of electoral process

Knowledge of electoral process	Right option (%)
Registration is requisite for voting	100
INEC only can declare result	100
Pregnancy not a barrier to voting	96.7
No sex restriction in voting	96.7
One man one vote	96.7
Right of party agent	89.3
Time for accreditation	88.7
Fingerprinting requisite for voting	84.7
Duration of election	62.0
Right to recall representatives	52.0
PVC for voting	41.3
18 years bench mark for voting	26.7
Physical voting	20.7
Vote buying	14.0

Table 3: Categorisation of respondents' knowledge of electoral process

Knowledge	Frequency	Percentage
Low level (7-8.92)	55	36.7
High level (8.93-11)	95	63.3
Total	150	100.0

Minimum = 7, Maximum = 11, Mean=8.93 and Standard deviation= 1.14

Level of involvement in electoral process

Table 4 reveals that the rural dwellers were mostly involved in registration ($\overline{x}$= 1.63), followed by involvement in presidential election ($\overline{x}$=1.07), accreditation ($\overline{x}$= 0.95) and party rally ($\overline{x}$= 0.81). The reason for their involvement in these activities in the rural areas could be that it is a requisite for them to participate in the electoral process and an opportunity for them to get some

benefits from the politicians in form of money or sometimes for fertilisers allocation. Respondents were least involved in vote counting ($\overline{x}$=0.47) and collation of result ($\overline{x}$=0.27). The least involvement in vote counting and collation is expected as the rural dwellers are not expected to perform these functions which are the exclusive functions of INEC but they are supposed to safe guard their vote

by being present during vote counting and collation of results as observers.

The categorisation of respondents in table 5, based on their involvement in electoral process reveals that more than half (56.0%) of the respondents had low level of involvement in electoral process while 44.0% had high level of involvement. The low participation of respondents in electoral process could be as a result of lack of interest, lack of time as well as low level of education in the study area. This finding agrees with Falade (2014) that there is low level of political participation in Nigeria and more than half of Nigerian citizens were not actively involved in political activities.

Table 4: Distribution of respondents by level of involvement in electoral process

Involvement	Always (%)	Occasional (%)	Never (%)	Mean	Rank
Registration	81.3	-	18.7	1.63	1st
Presidential election	41.3	24.0	34.7	1.07	2nd
Accreditation	36.0	22.7	41.3	0.95	3rd
Party rally	24.7	31.3	44.0	0.81	4th
Gubernatorial election	29.3	15.3	55.3	0.74	5th
National assembly	28.7	14.7	56.7	0.72	6th
State assembly election	24.0	17.3	58.7	0.65	7th
Local government election	14.7	26.7	58.7	0.56	8th
Vote counting	13.3	20.7	66.0	0.47	9th
Collation of result	10.0	7.3	82.7	0.27	10th

Table 5: Categorisation of respondents' involvement in electoral process

Level of involvement	Frequency	Percentage
Low level (5-7.86)	84	56.0
High level (7.87-20)	66	44.0
Total	150	100.0

Minimum = 5, Maximum = 20, Mean = 7.87 and S.D = 6.14

Attitude towards electoral process

Table 6 reveals that majority of the respondents agreed that their participation is not likely to be based on how much they can get from party agents (87.4%), that although elections take place on holidays, they will still go out to vote rather than using the period to rest / spend the time with their family (78.7%) and that I may not participate even if political agents do not comport themselves (66.0%). This implies that the respondents would be willing to sacrifice their time and money to carry out their civic duty. Furthermore, the categorisation of respondents in Table 7, based on their attitude towards electoral process reveals that more than half of the respondents (53.3%) had unfavourable attitude towards electoral process while less than half (46.7%) had favourable attitude towards electoral process. Respondents' unfavourable attitude is most likely due to the fact that the expectations of the voters are usually cut short by the electoral officers and even election results do not always reflect the true position of voters, in terms of number of votes. Constraints such as inadequate security at voting centers and difficulty in registering for Permanent Voters' Card (PVC), inadequate facilities at polling centers could also be responsible for respondents' unfavourable attitude towards electoral process. Studies conducted by George-Genyi, (2015) revealed that lack of interest of the electorates is an indicator of unfavourable attitude towards electoral process.

Constraints facing rural dwellers' involvement in electoral process

Results in Table 8 shows that the three most severe constraints facing respondents' involvement in electoral process were inadequate security at voting centers ($\bar{x}$=1.49), difficulty in registering for Permanent Voters' Card ($\bar{x}$=1.37) and inadequate facilities at polling centers ($\bar{x}$=1.31). According to the studies conducted by George-Genyi (2015) revealed that majority of eligible voters did not turn out for voting because they were afraid of insecurity and violence. Hence, Attoh (2015) opined that elections by their nature are confrontational and therefore require the assurance of equitable security to retain participants' confidence and commitment.

Table 6: Distribution of respondents by attitude towards electoral process

Attitudinal Statements	Strongly Agree (%)	Agree (%)	Undecided (%)	Disagree (%)	Strongly Disagree (%)
My participation is not likely to be based on how much I can get from party agents	34.7	52.7	8.7	4.0	-
Although elections take place on holidays, but I will still go out to vote rather than may use the period to rest and spend quality time with my family	22.0	56.7	8.7	2.0	10.7
I may not participate even if political agents do not comport themselves	22.0	44.0	7.3	16.7	10.0
It is likely I participate, if political parties produce qualified candidates	33.3	29.3	10.0	26.0	1.3
I may not participate if competent presiding officers is provided at my polling unit	22.7	40.7	6.7	18.0	12.0
I will not participate irrespective of the ethnic of the contestants	26.0	32.0	8.7	19.3	14.0
Despite the fact that most electoral process are not free and fair, I will still participate	19.3	38.0	1.3	36.0	5.3
I may not participate if I have difficulty in getting to the polling unit	8.0	46.7	12.0	32.7	0.7
I will not participate if there is poor weather condition on election day	26.7	28.7	8.7	17.3	18.7
I may not participate if enough security is not available on election day	23.3	32.0	5.3	23.3	16.0
I will participate even if eligible members of my family do not vote	24.7	22.0	17.3	17.3	18.7
I will participate irrespective of any candidate the political party of my choice will produce	1.3	44.7	24.7	21.3	8.0
Although past elections have failed to meet my expectation, but I may still participate	7.3	44.7	10.0	18.7	19.3
Past elections have failed to meet my expectation, therefore I will not participate	18.7	19.3	10.0	44.7	7.3
I will not participate irrespective of any candidate the political party of my choice will produce .	8.7	22.0	22.0	46.0	1.3
I may not participate if eligible members of my family do not vote	17.3	18.0	16.7	21.3	26.7
I will participate even if I have difficulty in getting to the polling unit.	1.3	32.7	10.7	46.7	8.7
Due to the fact that most electoral process are not free and fair, I will not participate.	(5.3	36.0	1.3	38.0	19.3
I will participate even if enough security is not available on election day	23.3	23.3	5.3	32.7	27.3
I will participate no matter the weather condition on election day	14.7	18.0	8.0	29.3	30.0
I will participate whether or not competent presiding officers is provided at my polling unit	10.7	16.0	8.0	40.0	25.3
I will participate irrespective of the ethnic of the contestants	12.0	16.0	8.7	34.7	28.7
It is not likely I participate, even if political parties produce qualified candidates.	3.3	28.0	9.3	28.7	30.7
I will participate even if political agents do not comport themselves	10.0	15.3	6.7	44.0	24.0
Due to the fact that elections take place on holidays, I may not go out to vote, but use the period to rest and spend quality time with my family	2.0	0.7	8.7	58.7	30.0
My participation is likely to be based on how much I can get from party agents	-	4.7	8.7	51.3	35.3

Table 7: Categorisation of respondents' attitude towards electoral process

Attitude	Frequency	Percentage
Unfavourable (48-75.15)	80	53.3
Favourable (75.16-102.0)	70	46.7
Total	150	100.0

Minimum = 48, Maximum = 102, Mean= 75.16 and Standard deviation= 11.56

Table 8: Distribution of respondents by constraints

Constraints	Mean	Rank
Inadequate security at voting centers	1.49	1st
Difficulty in registering for PVC	1.37	2nd
Inadequate facilities at polling centers.	1.31	3rd
Distance from home to voting centers	1.29	4th
Long waiting time between accreditation and voting.	1.20	5th
Long queue during voting	1.19	6th
Bad weather condition during electoral process.	1.11	7th
No formal education.	0.48	8th

This is an indication that most voters consider the security of their lives and properties paramount during election process and will not likely turn out to vote unless they are secured. Moreover, the only means of participation is the possession of PVC without which means the person cannot express his/her voting right even if one is interested to be involved.

Relationship between rural dwellers' attitude, knowledge, constraints and their level of involvement in electoral process

Result of Chi-square analysis in table 9 reveals a significant relationship between respondents' educational level (χ^2=39.28, p=0.00), primary occupation (χ^2=38.26, p=0.00), group membership (χ^2=45.47, p=0.00) and involvement in electoral process. The result of PPMC on table 9 also reveals that there was significant relationship between monthly income (r = 0.47, p=0.000) and their involvement in electoral process. This implies that respondents' educational level, primary occupation, group membership and monthly income influence the rural dwellers' involvement in electoral process positively. The relationship between level of education and involvement is expected as an informed person in the society would know the time of elections and the benefits to derive from participation, hence, could influence their level of involvement in the electoral process. The relationship between membership of group and involvement could be explained from the fact that members can encourage each other to actively be involved in electoral process, hence the positive correlation. The relationship between monthly income and involvement indicates that as respondents' monthly income increases, their involvement in electoral process also increases, thus, the higher their monthly income, the higher their involvement in electoral process. This is so because the respondents can use the good income from their jobs to surmount whichever constraints that may influence their involvement in electoral process, hence increase their participation in the electoral process.

Table 9: Relationship between respondents' selected socioeconomic characteristics and their involvement in electoral process

Variables	χ^2	df	p-value	Decision
Educational level	39.28	4	0.00	S
Primary occupation	38.26	6	0.00	S
Group membership	45.47	1	0.00	S
	r- value			
Monthly income	0.47	-	0.00	S

Relationship between rural dwellers' attitude, knowledge on electoral process, constraints in electoral process and their involvement in electoral process

The PPMC results in table 10 reveals that a significant relationship exists between respondents' attitude towards electoral process (r= 0.29, p= 0.000), knowledge on electoral process (r= 0.40, p= 0.000) and their involvement in electoral process. The relationship indicates that as the rural dwellers' attitudes towards electoral processes improves, their involvement in electoral process also increases. This could be explained from the fact that as the electoral body begins to put all things right; they will continue to gain the confidence of the electorates and their perception about the electoral process, hence their level of participation in electoral processes. The relationship between knowledge on electoral process and involvement of rural dwellers is

expected as a knowledgeable person will know his right of voting for someone and to be voted for, hence the correlation of the higher the knowledge the higher the level of participation in electoral processes.

Data in Table 10 also reveals that there is an inverse significant relationship between constraints facing respondents' involvement in electoral process (r= -0.66, p= 0.000) and their involvement in electoral process. This implies that the higher the constraints experienced by rural dwellers in electoral process, the lower their level of involvement in electoral process. This is expected as the higher the constraints experienced by the voters, the lower their involvement in electoral process. This suggests that if most of these challenges identified by the study were solved, low turn-out/involvement of rural dwellers during electoral process will improve.

Table 10: Correlation between respondents' attitude, kwowledge, constraints and their involvement in electoral process

Variable	r value	p-value	Decision
Attitude towards to electoral process	0.29	0.000	S
Knowledge on electoral process	0.40	0.000	S
Constraints	-0.66	0.000	S

Regression analysis on the relationship between selected independent variables and their involvement in electoral process

The result in Table 11 reveals that the F –value of 18.92 was significant at 0.05% level and an adjusted R^2 -value of 0.62, which implies that the independent variables can explain 62% contribution to rural dwellers involvement in electoral process in the regression model. The table further reveals that primary occupation (β=-0.141, P=0.032), monthly income (β=0.257, P=0.000), knowledge on electoral process (β=0.249, P=0.000) and constraints (β=-0.370, P=0.000) were the factors influencing rural dwellers' involvement in electoral process in Ogun State. However, there exists an inverse relationship between primary occupation and constraints. The most determinant factors contributing to rural dwellers' involvement in electoral process in Ogun State were monthly income (26.0%) and knowledge on electoral process (25%).

Table 11: Regression analysis on the relationship between selected independent variables and their involvement in electoral process

Variables	Beta	t-value	p-value
Constant			
Age	0.01	0.150	0.271
Sex	-0.07	-1.172	0.243
Marital status dummy	-0.02	-0.138	0.751
Household size	0.10	1.639	0.104
Education dummy	0.10	1.342	0.182
Membership of group dummy	0.11	0.761	0.448
Primary occupation	-0.14**	-2.168	0.032
Monthly income	0.26**	4.303	0.000
Knowledge on electoral process	0.25**	4.260	0.000
Attitude to electoral process	-0.02	-0.293	0.770
Constraints	-0.37**	-4.463	0.000

CONCLUSION AND RECOMMENDATION

The study concluded that most of the respondents were aged with high level of knowledge on electoral process which is likely to be able to withstand electoral rigors. However, the respondents' level of involvement and attitude towards electoral process was low and unfavourable respectively. The study also attested to the fact that primary occupation, monthly income, knowledge on electoral process and constraints were factors influencing rural dwellers' involvement in electoral process. Most voters consider the security of their lives and properties paramount and are often unwilling to turn out to vote unless they were secured through provision of adequate security measures as a necessity at voting centers. Other constraints such as difficulty in registering for PVC and inadequate facilities at polling centers should also be eliminated by deploying more card reading machines and personnel to stimulate voters' interest in electoral process. In addition, to ensure increased involvement in subsequent election process, the current political leaders should endeavor to fulfill their promises after being elected into office.

Educational level, primary occupation, group membership as well as monthly income, knowledge on electoral process and attitude towards electoral process had significant effect on the rural dwellers' involvement in electoral process in Ogun State. Educational and social institutions can therefore be harnessed for effective sensitisation and enlightenment about voters' right and the need to participate in election processes.

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PERCEPTION OF ARABLE CROP FARMERS ON HERDSMEN ACTIVITIES IN IBADAN/IBARAPA AGRICULTURAL ZONE OF OYO STATE

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ABSTRACT
The search for pastures by herdsmen has led to encroachment of arable crop farmers' farms in -recent times. This encroachment has negative impacts on arable crops production. The study investigated the perception of arable crop farmers on herdsmen activities in Ibadan/Ibarapa agricultural zone of Oyo state. A Multi stage sampling procedure was used to select 110 respondents for the study. Structured interview schedule was used to collect data which were analysed using descriptive and inferential statistical tools. Results showed that the mean age of respondents was 45.88 years, 86.4% were married with an average household size of 4.46 persons. Significant relationship existed between herdsmen activities (r=0.343), conflict resolution measures (r=0.242) and perception of farmers on herdsmen activities**.** The perception of arable crop farmers on herdsmen activities was favourable in the study area. Formation of conflicts resolution body that will see into settling conflicts between crop farmers and herdsmen should be put in place by leaders of the affected communities.
Keywords: Arable crop farmers, Herdsmen activities, Perception.

INTRODUCTION

Worldwide, arable crops enjoy remarkable dominance, playing significant roles in the socioeconomic lives of both rural and urban people. This includes a wide range of annual crops of primary importance such as maize, rice, sorghum, millet, cassava, cowpea, wheat, soybeans, melon, groundnut, yam and vegetables. In Nigeria, production of arable crops is essentially the prominent feature of agricultural activities. According to FAO (2010) seventy-five percent of today's food that comes from arable crops account for over fifty percent of the calories and proteins obtained from plants by human being while rural-based small scale arable crop producers derive their income it.

However, arable crop farmers' land is being encroached by herdsmen who are in search of pastures for their animals. This often causes serious problems such as destruction of crops and conflicts among the two groups (Aliyu, Ikedinma. and Akinwande, 2018). Other causes of farmer-herdsmen conflicts are increasing rate of cattle theft, inequitable access to land, diminishing land resources, policy contradictions and non-recognition of rights of indigenous people. These are often accompanied by violent confrontations, lost of lives and properties (Adisa, 2011).

The methods used in resolving conflict depend on the nature and magnitude of the conflict. In all cases where conflict has been occasioned by crop destruction and where the offending pastoralist admit guilt, interpersonal agreement may be reached, depending on the extent of the damage. Compensation (varying in amount) is often demanded and paid where minimal crops have been destroyed. There are other instances where herdsmen and arable crop farmer's interpersonal relationship is not very cordial, conflicts arising in such situation are not usually resolved by personal intervention. The village head and the head of herdsmen are usually involved in settling the dispute (Oyedokun and Lawal, 2017).

Herdsmen activities are usually accompanied by threats and attacks on the indigenes of communities where they graze their cattle (Odivwri, 2017). Some herdsmen in pursuit of their own private endeavors, shepherd their flock to other people's land to graze without considering the crops that are available on the farm land. These same crops are the only source of livelihood of the local farmers. When the cows destroy them, the farmers will suffer pangs of hunger and starvation for a full farming season. But when they complain and grumble, they are attacked, kidnapped and their women are raped Vanguard, (2017).

The sporadic and ongoing violent conflicts between herdsmen and farmers in rural communities in Nigeria is a serious threat to human security and development in the country (Adisa, 2011). According to International Crises Group (2017), the conflicts also have a strong potential to spread to other neighboring countries in West Africa while response to the crisis at both the federal and state levels have been poor. The victims of conflicts include women, children, young and old residents of the community. The depraved interrelationships between farmers and herdsmen have been seen to have negative impacts ranging from destruction of crops, contamination of streams by cattle, overgrazing of land, disregard for local traditional authorities, defecation of cattle on the road, cattle theft and straying of cattle. Although several recommendations towards minimising this conflict have been made by community leaders and governmental agencies, the problem of conflicts between farmers and nomad herdsmen still persist. This study therefore investigated the perception of arable crop farmers on the activities of herdsmen in Ibadan/Ibarapa agricultural zone of Oyo state, Nigeria.

The specific objectives were to:

i. describe the personal characteristics of the arable crop farmers
ii. ascertain arable crop farmers' awareness of the herdsmen activities;
iii. determine arable crop farmers mitigating measures against herdsmen activities and
iv. ascertain the arable crop farmers' perception of the herdsmen activities.

METHODOLOGY

The study was carried out in Ibadan/Ibarapa agricultural zone of Oyo state, Nigeria. Ibadan is located in south-western Nigeria, 128km inland northeast of Lagos and 530km southwest of Abuja, the federal capital. It is a prominent transit point between the coastal region and the areas to the north and is about 120km east of the border with the Republic of Benin in the forest zone close to the boundary between the forest and the savannah. The city ranges in elevation from 150m in the valley area, to 275m above sea level on the major north-south ridge which crosses the central part of the city. The city's total area is 1,190sqm (3,080km^2). The climate favours production of arable crops, such as Maize, Yam, Cassava, Rice and Cocoyam.

Multi stage sampling procedure was used to select the respondents for the study. The first stage involved purposive sampling of two Local Government Areas (LGA) in Ibadan/Ibarapa Agricultural Development zone due to the presence of activities of herdsmen. The second stage involved simple random sampling of two communities from each of the selected local governments areas. The third stage involved simple random sampling of 25% registered arable crop farmers in the selected communities. In all, a total of 110 arable crop farmers were sampled. Data were analysed using both descriptive such as frequency, mean and standard deviation and inferential statistical tools such as Pearson Product Moment Correlation (PPMC).

The dependent variable for the study is arable crop farmers perception which was measured by providing the respondents with a set of attitudinal statement and this was assessed on a 5-point scale of strongly agree, agree, undecided, disagree and strongly disagree, scores of 5,4, 3, 2,1 were assigned respectively. Awareness of herdsmen activities was measured by requesting respondents to choose from a list of statement on awareness using Yes (1) or No (0) response while mitigating measures against herdsmen activities was measured on a scale of always (3), occasionally (2) and rarely (1) from a list of response options.

RESULTS AND DISCUSSION
Socioeconomic characteristics of respondents

Table 1 shows that 38.2% of the farmers were within the age range of 51-60years while 10.9% were within the age range of 21-30 years. Average age of farmers was 45.88 years. It could therefore be inferred that farming is predominantly carried out by middle aged people who are energetic and more productive in the economic sector. This is in line with the findings of Dimelu, Salifu, Enwelu and Igbokwe (2017) who reported that most arable crop farmers are middle aged and active. Sex distribution of the respondents shows that majority (80%) of the respondents were male, while few (20%) were female. This implies that arable farming is mostly dominated by males. This is in accordance with the study of Adesiji, Dada, and Kolawole (2012) that male dominates arable farming because men are more energetic and capable of engaging in tedious production activities associated with farming than women. The marital status of the respondents reveals that majority (86.4%) of the respondents were married, 9.1% were single, 3.6% were divorced. This implies that majority of the respondents were married and may need a peaceful environment for their family security and welfare. This is in line with Oyedokun and Lawal (2017) who stated that people require peaceful atmosphere in order to go about their daily activities and be able to cater for their family needs.

Considering the level of education, 16.3% of the respondents had primary education, 48.1% had secondary education, 30.7% had tertiary education while 4.5% had no formal education. This implies that farmers in the study area were literate with one form of education or the other. This is in accordance with the findings of Dimelu et al. (2017) who reported that most arable farmers had little formal education. Information on household size shows that majority (62.2%) of the respondents had household size of between4-6 persons. This shows that farmers had relatively large family sizes which may mean more people to cater for and more hands to work on the farm and help with farming work. On years of farming experience, 34.5% of the respondents had between 1-10 years, 21.8% had 11-20 years, 39.1% 21-30 and 4.5% had 31-40 years. This implies that most of the respondents were well experienced in the production of arable crops. This is in accordance with Ofuoku and Isife (2009) who stated that majority of the farmers have long been in farming system.

Table 1: Socioeconomic characteristics of respondents

Variables	Frequency	Percentage	Mean
Age			
21-30	12	10.9	
31-40	23	20.9	45.88± 22years
41-50	33	30.0	
51-60	42	38.2	
Sex			
Male	88	80	
Female	22	20	
Marital status			
Single	10	9.1	
Married	95	86.4	
Divorce	4	3.6	
Widowed	1	0.9	
Educational Level			
Primary	18	16.3	
Secondary	53	48.1	
Tertiary	34	30.9	
No Formal Education	5	4.5	
Size of Household			
1-3	29	26.3	4.46±1.48
4-6	73	62.2	
Above 6	8	7.2	
Years of farming experience			
1-10 years	38	34.5	
11-20 years	24	21.8	17.55
21-30 years	43	39.1	
31-40 years	5	4.5	

Source: Field survey, 2018

Awareness of herdsmen activities by the arable crop farmers

Table 2 shows that most (92.7%) of the respondents were aware of herdsmen activities while 88.1% were aware of the destruction cause to crop. This implies that most of the respondent were aware of the activities of the herdsmen and the damages caused to their crops. This is in agreement with the findings of Ogunwande and Akinrinola (2017) which stated that majority of crop farmers indicated that major damages caused by the herdsmen activities was lost of crops. Furthermore, 90% of farmers were aware that herdsmen activities can cause reduction in crop yield/income and 88% of were aware that they cause various havoc within the community. This suggest that the effect of the activities of herdsmen could have adverse effects on agricultural productivity, lives and security of arable crop farmers and their communities. This is supported by the assertion of Ajibo, Onuoha, Obi-Keguna, Okafor, and Oluwole (2018) that the effect of insistent feud between herdsmen and farmers ranges from wanton destruction of lives and properties to decline in agricultural productivity which is the major source of sustenance within their communities and the nation.

Table 2: Distribution of respondents on awareness of herdsmen activities (n=110)

Statements	Yes	No
Are you aware of herdsmen activities?	92.7	7.3
Are you aware that they cause destruction to crops?	88.1	11.9
Are you aware that their cattle contaminate community source of drinking water?	73.4	26.6
Are you aware of prevalence of herdsmen attack in other parts of the country?	93.6	6.4
Are you aware that they cause reduction in crop yield/income of farmers?	90.0	10.0
Are you aware that the herdsmen attack cause loss of lives and property?	83.6	16.4
Are you aware herdsmen cause havoc within the community?	88.0	11.1

Source: Field survey, 2018

Mitigating measures against herdsmen activities

Table 3 shows that payment of compensation to victims ($\bar{x}$=2.35), dialogue between the two parties involved($\bar{x}$=2.35) and use of traditional conflict resolution mechanisms ($\bar{x}$=2.2) were the mitigating measures always used to mitigate against herdsmen activities in order to restore peace. This is in agreement with Adelakun, Adurogbangba and Akinbile (2015) who stated that dialogue between the parties involved and payment of compensation to victims were among the means of conflict resolution measures used by their respondents.

Table 3: Distribution of the respondents on mitigating measures against herdsmen activities

Statements	Always	Occasionally	Rarely	Mean
Payment of compensation to victims	44.0	48.6	7.3	2.35
Dialogue between two parties involved	38.5	56.9	4.6	2.35
Engage in massive and sustained awareness	32.7	54.6	12.0	2.17
Provide logical support to security agencies	32.4	46.3	21.3	2.07
Establishment of ranches and grazing lands	32.1	33.9	33.9	1.96
Establishment of cattle colonies	22.0	42.2	35.8	1.84
Expanding grazing reserves	27.1	40.2	32.7	1,89
Government law and policies	33.9	30.3	35.8	1.96
Restriction to migration of agro-pastoralist	27.8	45.4	26.9	1.97
Use of traditional conflict resolution mechanisms	45.8	34.6	19.6	2.20

Source: Field survey, 2018

Perception of arable crop farmers on herdsmen activities

Table 4 shows that arable crop farmers strongly agreed that grazing of cattle leads to low crop productivity (61.8%), grazing of cattle damages cultivated crops (58.2%) and loss of productive resource could lead to poor income (46.6%). This implies that the activities of herdsmen may possibly affect the productivity of farmers and invariably their seasonal income. This finding is in consonance with Chiakaan, Pwashikai, and Alyegba, (2019) who stated that most frequent perceived causes of arable crop farmers towards herdsmen activities are grazing of cattle which has led to low productivity and income. Table 4 further reveals that 52.3% of arable crop farmers strongly agreed that milking of cattle by herdsmen enhances cheese production. This implies that there is availability of more cheese during the breeding season of cattle and this often occur simultaneously with the planting season of arable crop farmers, there is therefore the possibility of conflict occurrence during this period. This is in agreement with the assertion of Adisa (2012) that farmer-herdsmen conflicts become more prevalent during the planting and breeding seasons. Also, 49.1% of the farmers strongly agreed that Nomads activities involve sexual harassment of women farmers which sometimes lead to adduction or killings. This is supported by Ajibefun (2018) who stated that one of the major causes of conflict between crop farmers and herdsmen is sexual harassment of women.

Table 4: Distribution of respondents on their perception on herdsmen activities (n= 110)

Statement	SA	A	U	D	SD
Grazing of cattle leads to low crop productivity	61.8	31.8	2.7	1.8	1.8
Grazing of cattle damages cultivated crops	58.2	35.5	5.5	0.0	0.8
Contamination of streams by cattle dungs	43.6	39.1	10.0	4.5	2.7
Defecation of cattle on farms serve as manure to crop farmers	37.3	42.7	5.5	12.7	1.8
Milking of their cattle has enhanced cheese (wara) production	52.3	31.2	8.3	5.5	2.8
Nomads have regard for local traditional authorities	38.3	27.1	10.3	14.0	10.3
Nomads activities involve sexual harassment of women by nomads	49.1	39.8	5.6	1.9	3.7
Stray of cattle destroys crops on the field	46.3	41.7	8.3	3.7	0.0
Destruction of crops could cause low harvest	48.1	32.4	11.1	6.5	1.9
Loss of productive resource could lead to poor income	48.6	34.6	10.3	5.6	0.9

SA= Strongly Agree, A= Agree, U= Undecided, D= Disagree, SD= Strongly Disagree
Field survey, 2018

Categorisation of the respondents on perception on herdsmen activities

Table 5 reveals that perception of arable crop farmers towards herdsmen activities was

75.5% favourable and 24.5% unfavourable. This implies that the frequency of damages caused by herdsmen activities in the study area has a great impact on the productivity of the arable crop farmers. This is supported by Aliyu, Ikedinma and Akinwande (2018) that herdsmen activities have the capacity to destroy source of livelihood of farmers because cattle hooves compact the soil of the farm thereby making it less productive to farmers.

Table 5: Categorisation of perception of arable crop farmers on herdsmen activities

Variable	Freq.	%	Maximum	Minimum	Mean	SD
Unfavourable	27	24.5	96	22	76.90	12.61
Favourable	83	75.5				

Field survey: 2018

Relationship between awareness of herdsmen activities, conflict resolution measures and perception of arable crop farmers

Table 6 shows that there is a significant relationship between the awareness of herdsmen activities and perception of arable crop farmers (p=0.00). This implies that the herdsmen activities could have adverse effect on the income or farm yield of the farmers. This agrees With Ajibo *et al.* (2018) that the economic repercussions of herdsmen activities can lead to loss of income as a result of farm destruction. Table 6 further shows that there is a significant relationship between conflict resolution measures and perception of arable crop farmers towards herdsmen activities (p=0.01). This suggests that the conflict resolution measure can restore peace and security against the detrimental effects of conflicts on the livelihood of arable crop farmers and herdsmen. This is in agreement with Oyedokun and Lawal (2017) who stated that conflict resolution measure will guarantee peace and the well-being of people in conflict areas.

Table 6: Relationship between herdsmen activities and perception of arable crop farmers

Variables	r-value	p-value	Remark
Herdsmen activities	0.343	0.00	Significant
Conflict resolution measures	0.242	0.01	Significant

Field survey: 2018

CONCLUSION AND RECOMMENDATION

The study revealed that perception of arable crop farmers on herdsmen activities was favourable, awareness of herdsmen activities was high while payment of compensation to victims and use of traditional conflict resolution mechanisms were the major mitigating measures used by the respondents against herdsmen activities in the study area. Formation of conflicts resolution body that will see into settling conflicts between crop farmers and herdsmen in order to forestall occurrences of conflicts should be put in place by leaders in the affected communities. There is a need for government intervention in mediating between conflict cases and provision of financial assistance to affected farmers and farming communities.

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POVERTY STATUS AMONG FARMING HOUSEHOLDS IN OGBOMOSO SOUTH LOCAL GOVERNMENT AREA OF OYO STATE, NIGERIA

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ABSTRACT
The study assessed poverty status among farming households in Ogbomoso South Local Government Area (LGA) of Oyo State. It identified the causes, determined the depth and severity of poverty. Multistage sampling procedure was used to select a total of 110 respondents from 22 households in 5 out of the 10 wards in the LGA. Primary data were collected using validated interview schedule. Multiple regression analysis was used to examine the effects of selected variables on household poverty. Results showed that the respondents' mean age, years of education and annual income were 47 years, 8 years and N202,547.27, respectively. While the poverty line and poverty incidence were N135,030.7 and 50.9 percent, respectively. Lack of access to farm machinery (79.1%), poor road network (70.9%), non-accessibility to storage facilities (60.9%) were the identified causes of poverty among respondents. Respondents' age (t = -0.759), household size (t = 0.576) and farm size (t = -1.344) were the determinants of poverty among the farming household. Nearly half of the farming households were below poverty line. The study recommended that government should make farm machinery available to the farmers at affordable price, improve on infrastructure and road constructions.
Keywords: Poverty, Poverty depth, Poverty severity, Farming households

INTRODUCTION

Poverty has been defined in various ways and there seems to be no universal way of defining poverty (Agarwal, 2019; Marin *et. al.*, 2019; Hagenaars, 2017; Nsikak-Abasi and Solomon, 2010). Poverty is more easily recognized than defined (Foster *et al.*, 2010). According to United Nations (1998) as quoted in Gordon (2005):

"Fundamentally, poverty is a denial of choices and opportunities, a violation of human dignity. It means lack of basic capacity to participate effectively in society. It means not having enough to feed and cloth[e] a family, not having a school or clinic to go to, not having the land on which to grow one's food or a job to earn one's living, not having access to credit. It means insecurity, powerlessness and exclusion of individuals, households and communities. It means susceptibility to violence, and it often implies living on marginal or fragile environments, without access to clean water or sanitation".

Poverty is a situation where people have unreasonably low living standards compared with others; cannot afford to buy necessities, and experience real deprivation and hardship in everyday life (McClelland, 2000). The World Bank describes poverty as deprivation in well-being that comprises many dimensions which includes low incomes and the inability to acquire the basic goods and services necessary for survival with dignity. Poverty also encompasses low levels of health and education, poor access to clean water and sanitation, inadequate physical security, lack of voice and insufficient capacity and opportunity to better one's life" (Narayan *et al.*, 2000).

According to the Ghana Poverty Reduction Strategy (GPRS) (2004), poverty is recognized as multi-dimensional with complex interactive and causal relationship between the dimensions. The poor often lacks access to finance and income-earning opportunities (SIDA, 2005). Poverty according to Yunus (2006) is characterized by being in a state of joblessness, homelessness, lack of adequate capital, facilities and food to eat for a decent living. The conventional concept of poverty depicts it as a condition in which people live below a specified minimum income level and are unable to provide the basic necessities of life needed for an acceptable standard of living.

Poverty is multi-dimensional and no single indicator can capture all the aspects of poverty (Peng, 2018; Wossen *et al.,* 2019; Adepoju, 2019; Oladeebo *et al.*, 2017). Statistically however, poverty is determined based on income and/or consumption, which assigns numbers to living standards and makes it easier to calculate poverty. In calculating poverty line for 2009-10 using the income approach, the threshold which was considered poor by National Bureau of Statistics was defined at ₦55,235.20 per person per year. The absolute poverty incidence using per capita approach was calculated as 62.6% in 2009-10. Rural poverty reduced from 73.4 to 69.0 per cent from 2003-04 to 2009-10. According to National Bureau of Statistics, the poverty headcount differs considerably in different states of the Nigerian Federation. In 2003-2004, Oyo was estimated to have the lowest poverty rate of 38 percent which increased to 50% in 2009-2010 (NBS, 2012).

Extreme poverty as defined by the World Bank is a situation whereby a person is living below poverty line of $1.90 per day. As at June, 2018, Nigeria has the highest number of poor people with an estimated 86.9 million people living in extreme poverty followed by India with 71.5

million. Data from the World Poverty Clock showed that by the end of 2018, close to four million were added to the population of people living below $1.90 per day thereby increasing the number of extreme poverty to an estimated 90.8 million Nigerians. This represents nearly 50% of its estimated population of 180 million (World Poverty Clock, 2018).

Nigeria has vast and abundant agricultural resources, yet the incidence of poverty is more pronounced and basic infrastructure is lacking especially in the rural areas where the bulk of agricultural production takes place (World Bank, 2005). This has worsened the production capacity of the existing farming households' thereby increasing poverty level significantly among them (Okunmadewa, 2001)

For a long time, research efforts have focused on poverty and determinants of poverty in the general populations until last decade when attention started shifting to specific populations especially the faming households (Ogwumike and Akinnibosun, 2013; Etim and Udoh, 2013; Olorunsanya et al., 2012; Akpan, et al., 2016; Abu and Soom, 2016; Oyinbo, 2016; Omotesho et al., 2016; Adepoju, 2019; Nwibo et al., 2019). Few of the studies on farming households concentrated on determinants without assessing the poverty situations of the farming households except for the work of Ogwumike and Akinnibosun (2013) that reported high incidence of poverty among farming households in Nigeria and found socioeconomic variables such as age, household size, income, number of farms as major determinants of poverty.

Despite the efforts of government and non-government agencies in alleviating poverty, Nigeria has the highest number of people living in extreme poverty with 90.8million people and this represents nearly 50 percent of its estimated 180 million population (World Poverty Clock, 2018). The poverty situation in the rural areas is more severe (Ogwumike and Akinnibosun, 2013). For any policies or programmes aimed at reducing poverty to be effective, it is important to first assess the poverty conditions and levels of specific segments of the population for a proper understanding of the challenges posed by the incidence of poverty. Studies have shown that poverty is disproportionately concentrated among households whose primary livelihood lie in agricultural activities (FAO, 2006). In the light of the above, the study carried out an assessment of poverty situations among farming households in Ogbomoso South Local Government Area of Oyo State using poverty measures derived by Foster-Greer-Thorbecke. It also described the influence of socioeconomic characteristics of the respondents on poverty. It identified the causes and determined the depth and severity of poverty of the respondents.

METHODOLOGY

The study was carried out in Ogbomosho town - a predominantly Yoruba-speaking city in the Southwestern Nigeria. Ogbomosho has a land area of 373square kilometers and an average rainfall of 1330mm. The population was approximately 645,000 in 2006 census (Federal Republic of Nigeria, 2007). Ogbomosho has five (5) Local Government Areas (LGAs) which are; Ogbomosho North, Ogbomosho South, Surulere, Ogo-oluwa and Orire. The town is located in the savannah zone which makes farming the traditional source of economy. Common food crops cultivated include tuber (yam, cassava, cocoyam, and potato), grains (maize, guinea corn) and cowpea. Major tree crops being cultivated in the town are cocoa, Oil palm, kola nut, coconut and varieties of fruits.

The study design was cross-sectional in nature and utilised multistage sampling procedure in selecting the respondents.The study was conducted in Ogbomosho South Local Government Area (LGA) one of the 5 LGAs in Ogbomosho zone. In the first stage, 5 wards were randomly selected from the ten wards in the selected LGA. In the second stage, in each of the 5 wards, 22 household heads were randomly selected to give a total of 110 household heads interviewed in the study.

Primary data were collected through the use of a well-structured questionnaire using interview schedule.The data collection instrument was administered on each head of households (male or female). Data on socioeconomic characteristics included age, education status, sex, marital status, family size, farm size measured in acres, years of experience in farming, primary occupation and membership of agricultural-based cooperative society. Poverty variables included in the analysis were poverty gap index, poverty depth and poverty severity index.The incidence of poverty among the respondents was determined in a similar study using the headcount index which is the proportion of the population whose income is below the poverty line-who cannot afford to buy a basket of basic goods (Eze et al., 2019). FGT poverty index was used to depict the extent of poverty among the farming households. The poverty aversion parameters employed were P0, P1, and P2 which means poverty incidence (head count), gap (depth) and severity, respectively. This study employed income approach method as a yard stick to set the poverty line i.e. the poverty line was drawn based on total income of the household head which is the two-thirds (2/3) of annual mean income of the farming household heads.

Data on socioeconomic characteristics were analysed using descriptive statistics such as frequency and percentage, means and standard deviation. The Foster-Greer-Thorbecke (FGT) model was used in analysing poverty indices.

The FGT poverty index is computed with the mathematical formula stated below:

$$P_1 = \frac{1}{2} \sum_{i=1}^{q} \left(\frac{Z - y_i}{Z} \right)$$

Where: n = total number of households in population

q = the number of poor households

Z = the poverty line for the household

yi = household income

α = poverty aversion parameter and takes on value 0, 1, 2

$$\left(\frac{Z - y_i}{Z} \right)_=$$ proportion of shortfall in income below the poverty line.

Three poverty measures were computed namely poverty index, poverty depth also known as poverty gap index and poverty severity index as follows:

1. The incidence of poverty or headcount index was calculated using the equation above where α = 0 in FGT. This measures the proportion of the population that is poor or fall below the poverty line. It is used to determine the number of households having *per capita* income below the poverty line. When α = 0 in FGT, the expression becomes:

$$P_0 \left(\frac{1}{n} \right) q = \left(\frac{1}{n} \right)$$

2. Poverty depth or poverty gap index is the measure of the extent to which individuals fall below the poverty line as a proportion of the poverty line the aggregate shortfall in income of the household from the poverty line. It measures the difference between actual income and minimum non-poverty income. This was calculated using the formula where α = 1, hence the expression becomes;

$$P_1 = \frac{1}{2} \sum_{i=1}^{q} \left(\frac{Z - y_i}{Z} \right)$$

3. Poverty severity index is the measure of the squares of the poverty gap relative to the poverty line. This was calculated using the formula where α = 2, hence the expression becomes;

$$P_2 = \frac{1}{n} \sum_{i=1}^{q} \left(\frac{Z - y_i}{Z} \right)^2$$

Lastly Multiple Regression analysis was used to examine the effects of selected variables on household poverty. The Beta coefficients were used to determine the relative importance of each of the selected independent variables on household poverty.

RESULTS AND DISCUSSION
Socioeconomic characteristics

Table 1 revealed that respondents' mean age, family size and farming experience were 47.1± 10.7years, 6±2 persons, 19.5±11.8 years, respectively. This implies that majority of the respondents are middle aged, of an average family size and had spent a good number of years on farming practices. This shows that the respondents had long years of farming experience and are more likely to perform better using the wealth of experiences they have gathered over the years. The average family size is in agreement with similar findings of Oladejo (2011) which revealed a relatively similar mean household size.

Majority (77.3%) of the respondents were male which implies that male farming household heads were more than female in the study area. This result corroborates the work of Aigbhokhan (2000) that male headed household (86%) is more than the female headed. A greater proportion (74.5%) of the farming household was married. The predominance of married people in the study area may be attributed to the prevalence of early marriages or the ideals of the customs and traditions that are held in high esteem. Data on level of education of the respondents reveal that 31.8 percent had no formal education and complete secondary education, 19.1 percent had primary education. According to Owuor *et al.* (2007), education tends to reduce poverty, implying that the more educated the households are, the better skilled and productive they will be and the less poor. This may be responsible for the poverty of most households in the study area.

Majority (71.8%) of the respondents were farmers, 11.8 percent were artisans, while 9.1 percent were into trading. Those in the civil service constituted 7.3 percent of the respondents. This insinuate that most household heads were full-time farmers and consequently should be able to cater for the basic needs of their families.

The farm size still confirms the peasant nature of the study area where majority (68.2%) of the respondents farmed on less than 1 acre of land with the mean farm size of 0.8±0.6 acre. This implies that most of the farmers in the study area are small scale farmers and consequently output may be generally low. The small farm size can limit the ability of the farmers to generate tangible income and other benefits. More than three quarters (77.3%) of the respondents were native of the sampled area. Nativity could determine the type of livelihood activity the respondents were involved in. Nativity guarantees access to communal agricultural resources as well as security. Majority (60.9%) of the respondents are not in any agricultural-based group. This implies limited or no opportunity of interacting with other farmers to enhance diffusion of innovation among the farmers.

Table 1: Distribution of respondents according to their socioeconomiccharacteristics (n=110)

Characteristics	Frequency	Percentage (%)
Age		
≤30	7	6.4
31-40	25	22.7
41-50	43	39.1
51-60	21	19.1
Above 60	14	12.7
Mean/std	47.1/10.7	
Sex of household head		
Male	85	77.3
Female	25	22.7
Marital status		
Single	8	7.3
Married	82	74.5
Divorced/widowed	20	18.2
Education status		
No formal education	35	31.8
Primary	21	19.1
Secondary	35	31.8
Tertiary	19	17.3
Family Size		
≤3	12	10.9
4-7	84	76.4
8-10	14	12.7
Mean/sd	5.6/1.9	
Primary Occupation		
Farming	79	71.8
Trading	10	9.1
Civil servants	8	7.3
Artisans	13	11.8
Farm size (acres)		
Below 1	75	68.2
1-5	35	31.8
Mean/std	0.8/0.6	
Years of farming experience		
10-20	75	68.2
21-40	31	28.2
41 or more	4	3.6
Mean/std	19.5/11.8	
Nativity		
Yes	85	77.3
No	25	22.7
Member of Agricultural-based group		
Yes	43	39.1
No	67	60.9

Source: Field Survey, 2018

Causes of poverty among farming households

Table 2 shows that lack of access to farm machinery (79.1%), no strong political voice (71.8%), lack of access to good roads (70.9%), Non-accessibility to water supply (68.2%) and no access to storage facilities (60.9%) were the causes of poverty identified by the respondents. It can be deduced that infrastructure is one of the major causes of poverty in the study area. Indicators of infrastructure development lacking in the study area include proximity to access roads, water supply, farm machinery, electricity, proximity to large markets, availability of schools and medical clinics in the area, provision of agricultural tools and material such as storage facilities, fertiliser, herbicides, and pesticides. Similar findings were reported by Bamiwuye and Adisa (2015) in a study of the roles of community based-organisation in rural development activities in Osun State, Nigeria.

Table 2: **Distribution of the respondents according to causes of poverty in the study area (n=110)**

Variables*	Frequency	Percentage (%)
Non-accessibility to Farm machinery	87	79.1
Non-accessibility to Political voice	79	71.8
Poor/ Lack of Good road	78	70.9
Non-accessibility to Water supply	75	68.2
Lack of storage facilities	67	60.9
Lack of credit facilities	65	59.1
Inadequate Security	51	46.4
Non-Accessibility to Extension worker/agent	51	46.4
Non-accessibility to Fertiliser	48	43.6
Non-accessibility to Pesticide	47	42.7
Non-accessibility to Herbicides	47	42.7
Non-availability of Seed	47	42.7
Non-accessibility to Skill acquisition programme	43	39.1
Non accessibility to Electricity	38	34.5
Inadequate health care service	33	30.0
Lack of formal education	25	22.7
Non-availability of Farm tools	18	16.4
Non-availability of Labour	11	10.0
Non-availability of Markets for goods and services	5	4.5

*Multiple responses
Source: Field Survey, 2018

Poverty status of farming households

The mean income of the farming household head was ₦202,547.27. The value of poverty line computed was ₦135,030.75 per annum (i.e. 2/3 of ₦202,547.27). Thus, the farming household heads that earn less than the value of poverty line were considered being poor, which is about 50.9 percent of the sampled household heads, while those that earn greater than equal to the value of poverty line were considered to be non-poor which is 49.1 percent of the sampled household heads. The incidence of poverty (P0) in this study was 0.509 indicating that 50.9 percent of the sampled farming household heads were actually poor based on the poverty line. This finding agreed with that of Anyanwu (2013) which stated that poverty in Nigeria is largely a rural phenomenon. P1 (poverty depth) among the farming households was 0.147, implying that an average poor farming household would require 14.7 percent of the poverty line to get out of poverty. The value P2 (poverty severity) was 0.022, indicating that the poverty severity of poor farming households was 2.15 percent. This result means that farmers need about 2.15 percent increase in per capita income to push them away from severe poverty.

Table 3: Distribution of respondents according to poverty level and measures (n =110)

Poverty indices	Measures	Percentage %
Poor	56	50.9
Non- poor	54	49.1
Poverty incidence (P0)	0.509	50.9
Poverty gap (P1)	0.147	14.7
Poverty severity (P2)	0.022	2.15
Poverty line	₦135030.75	
Average income	₦202547.27	

Source: Field Survey, 2018

Factors influencing poverty status of farming households

The result of multiple regression analysis showed that the coefficient of age (X_1) is negative and significant at 5% level. This implies the higher the age, the lower their poverty level. This result can be attributed to the ability of older farming household heads to diversify and manage their household income and expenditure. The coefficient of household size (X_3) is positive and significant at 1% level. This implies that the larger the household size, the higher the level of poverty among the farming household. This is affirmed by the fact that the larger the household size the larger household generated income consumed and this will aggravate their poverty level significantly. The negative coefficient of farm size (X_6) implies that the larger the farm sizes the lower the poverty status among

the farming households. In a similar study, Ezeh *et al*. (2019) identified farm income and dependency ratio as determinants of poverty status among ginger farmers in Southern Kaduna, Nigeria. In an earlier study, Ogwumike and Akinnibosun (2013) also reported age, household size, income, number of farms as determinants of poverty among farming households in Nigeria.

Table 4: Regression analysis showing factors influencing poverty among farming households

Variables	β	t-value	p-value
(Constant)	-0.241	-1.859	0.000
Age	-0.002.	-0.759	0.037**
Sex	-0.082	-1.497	0.714
Household size	-0.007	0.576	0.008***
Education In Years	0.002	0.023	0.441
Farming Experience	0.001	0.269	0.763
Farm Size	-0.054	-1.344	0.043**
Education Status	-0.007	-0.355	0.355
Income	4.791E-06	17.908	0.069*
R^2= 0.841;			

*** Significant at 1%, ** Significant at 5%, * Significant at 10%
Source: Field survey, 2018

CONCLUSION AND RECOMMENDATIONS

Based on the findings of the study, farming household is poor as half of the farming households were below poverty line. The households' age, household size, farm size and income from farming activities are some of the factors influencing poverty among the farming household in the study area. Respondents identified lack of access to farm machinery, lack of access roads and potable water as well as poor storage facilities as the causes of their poverty. Based on the findings, government should make farm machinery available to the farmers at affordable price, improve infrastructure and construction of access roads would go a long way to improve the living condition of the people in the study area.

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POST-CONFLICT LIVELIHOOD CHANGE OF FARMERS IN IFE-MODAKEKE COMMUNITIES OF OSUN STATE, NIGERIA

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ABSTRACT

Livelihood Change (LC) is often the foremost priority of the individual victims, affected communities, governments and non-governmental organisations after conflicts. This study therefore assessed the post-conflict livelihood change of farmers in Ife-Modakeke communities of Osun State, Nigeria. A three-stage sampling procedure was used to select 153 respondents for this study and interview schedule was used to elicit information on respondents' accessibility to rehabilitation support programme, livelihood outcome [during Conflict De-escalation (CD) and Post-Conflict (PC)] and livelihood change. Data were analysed using descriptive statistics such as percentages, frequencies and mean. Few farmers (19.3%) had access to rehabilitation support programme and majority (81.7%) of them at low level while, farmers ranked provision of building materials as the most important rehabilitation support item to them. Livestock production and material possession among farmers were high (72.1% and 64.7%, respectively) during post-conflict. However, crop output of farmers was low (73.7%) during post-conflict. The livelihood change was low (7.1%) as majority (57.3%) of the farmers had low livelihood change, 14.7% recorded negative change while, only 28.0% had high livelihood change. It is therefore recommended that further support and assistance in form of provision of farm inputs and credit by Osun State Government, affected Local Governments and NGOs should be rendered to farmers in the conflict areas in order to enhance post-conflict livelihoods of farmers.

Keywords: Livelihood change, Conflict de-escalation, Livelihood activities and Farm diversification

INTRODUCTION

Sustainable livelihood remains the panacea for poverty reduction. Eradication of extreme poverty represents one of the greatest challenges in the world. In realisation of this fact Governments and Multilateral Lending Institutions create or support programmes for combating poverty such as conditional cash transfers, microfinance, small/medium enterprises and rural employment guarantee schemes (Eneanya, 2007). Livelihoods are both the economic activities (agricultural and non-agricultural) and non-economic activities that people know, own and undertake to earn income today and into the future (Oyesola and Ademola, 2011). In other words livelihood comprises the capabilities, assets (natural, physical, human, financial and social capital) and activities that are required for a means of living.

The concept of 'livelihood' seeks to bring together the factors that affect the vulnerability or strength of individual or family survival strategies. Livelihood activities may vary from one rural area to another depending on the available resources, infrastructures and climatic conditions of the environment (Ellis, 2000). Carney (1999) quoted in Bolarinwa (2007) opined that sustainability of the farmers' livelihood context will bring about livelihood outcomes such as food security, health, water, shelter, education, community participation and personal safety. However, in coping with livelihood sustainability, farmers compete for resources that are scarce or exist in limited quantities. Competition creates a situation whereby people struggle for possession of these scarce resources which often generate conflicts. Conflict is defined as agitation for change which could lead to positive or negative outcome. When it is positive, it leads to growth and development but when negative it results into wanton destruction of life and properties. Conflict situations threaten livelihood outcomes and also cause termination of rural dwellers' sustainable livelihood income (Bolarinwa, 2007).

Nigeria is a large multi-ethnic country where ethnic cleavages remain a critical problem and ethnic violence has erupted periodically. Among the prominent conflicts in Nigeria are: Ife-Modakeke crisis in Osun State; Yoruba-Hausa clashes in Sagamu, Ogun State; Eleme-Okrika conflict in Rivers State; Zango-Kataf crisis in Kaduna State; Tiv-Jukun conflict in Wukari, Taraba State; Ogoni-Adoni conflict in Rivers State; Chamba-Kuteb crisis in Taraba State; Itsekiri-Ijaw/Urhobo conflict in Delta State; Aguleri-Umuleri crisis in Anambra State; Ijaw-Ilaje conflict in Ondo State; Basa-Egbura crisis in Nasarawa State and Hausa/Fulani-Sawaya conflict in Bauchi State.

The circumstances that led to the birth of Modakeke, the status of Modakeke and that of its people have always been a source of dispute and conflict due to issues relating to landlord/tenant relationship or indigene/non-indigene issues. Ife people who are the original settlers in the area insist that Modakeke people remain in perpetuity as tenants on their land, notwithstanding the fact that Modakeke people migrated and settled on the land as far back as 17th century as a result of the collapse of old Oyo empire. In both Ife and Modakeke, ethnic attachment is high and interpersonal relationship among the people of the two towns is not very cordial (Asiyanbola, 2012). Hence, the incessant conflicts between the two communities.

Some of the recent conflicts between the two communities include conflict over the establishment of Modakeke High School, conflict over the establishment of Olorunsogo plank market, opposition to self-help development projects by a fund raising activity of Modakeke in 1980 and the request for a separate Local Government Council which began as far back as 1950s. Self-determination with respect to request for a separate Local Government Area by Modakeke was the major cause of serious violent crisis between Ife and Modakeke in 2000-2001 which claimed several lives and properties including destruction of farmers' settlements and farms worth millions of Naira.

One of the major consequences of conflict is the diversion of resources from production to destructive activities such as destruction of assets which leads to a corresponding reduction in economic productive activities. As a result, re-building livelihood and economic recovery are major challenges in conflict areas and therefore livelihood recovery in post conflict situations is often the foremost priority of the individual victims of conflict, the affected community as well as governments and NGOs. Shortly after the violent crisis of 2000/2001 in Ife and Modakeke in Osun State stopped, that is conflict de-escalation stage, intervention structures like governments, NGOs and traditional institutions moved in to provide support and assistance in form of distribution of agricultural inputs (seeds, fertilisers, agro-chemicals among others), supply of agricultural tools and equipment, provision of capacity building trainings and re-building of damaged public infrastructures (schools, health and maternity centres, markets among others). These interventions were meant to assist conflict victims in their livelihood efforts to escape from poverty and enhance their well-being while, at the same time address the major risk factors for conflict re-occurrence.

Previous studies which included Bajo (2015), Alimba (2014), Omotere (2013), Bolarinwa et al (2010), Olayiwola and Okorie (2010), Bolarinwa (2007), Agbe (2001), Toriola (2001) and Albert (2001and1999) have documented the historical perspectives of conflicts, the effect of conflict on farmers' livelihood and well-being as well as conflict management, resolution and transformation methods. However, there is dearth of information on studies conducted to determine the post-conflict livelihood change of farmers in Ife and Modakeke communities in Osun State. Hence, this study is conceptualised to investigate the post-conflict livelihood change of farmers in Ife and Modakeke communities in Osun State by comparing the livelihood status of farmers in 2003 (conflict de-escalation) and 2016 (post-conflict).

This study will address the following specific objectives;
  i.   determine farmers' level of accessibility to rehabilitation programme for conflict victims.
  ii. ascertain farmers' livelihood outcome viz crop and livestock production and material possession in 2003 (conflict de-escalation) and 2016 (post-conflict).
  iii. determine farmers' post-conflict livelihood change viz level of crop and livestock production, material possession and Per Capita Expenditure (PCE).

METHODOLOGY

This study was conducted in Osun State, Nigeria which has four administrative zones namely Osogbo, Ife/Ijesa, Ikirun and Iwo with 30 Local Government Areas. It has a population of 3.42 million (NPC, 2006). It also has a land area of 10,245.00 square kilometres. The climate is low land tropical forest with distinct wet (April-October) and dry (November-March) seasons. Mean annual rainfall is above 1200mm while, average annual temperature is 24.7°C (climate-data.org, 2019). The southern part of the State is covered by secondary forest, northern part is dominated by forest savannah mosaic while, the western part is mostly woody savannah. Majority of the rural populace are farmers cultivating tree crops like cocoa, oil palm, kolanut and citrus as well as food crops such as yam, cassava, maize and rice.

A three-stage sampling procedure was used. The first stage was the purposive selection of four LGAs namely Ife Central, Ife North, Ife South and Ife East which constituted the core conflict areas. The second stage was the purposive selection of 31 villages out of a total of 54 villages in the selected LGAs based on the degree of violent crisis that occurred in these villages while, the final stage was the random selection of 2.5% out of 6120 farmers in the selected villages. The list of villages as well as farmers' population was obtained from the village listing exercise conducted by Osun State ADP in 2002. Thus, a total of 153 respondents were selected for this study. Recall method was used to collect data on what farmers' livelihood condition was in 2003 (conflict de-escalation) and what the condition was in 2016 (post-conflict). Interview schedule using structured questionnaires was used to elicit information from respondents on relevant variables as specified in the objectives of this study. Questionnaires were administered on 153 farmers but 150 were retrieved.

Accessibility of respondents to the rehabilitation programme was measured at nominal scale with Yes response assigned 1 point and No response zero point for the eight rehabilitation support items listed while, the importance of each

of the items was measured on a 3-point scale with very important assigned 2 points, important 1 point and not important zero point. Percentage was used to summarise the level of farmers accessibility to the rehabilitation programme while, weighted mean score was calculated for each rehabilitation support item and it was used to rank the rehabilitation support items on the basis of their importance to the respondents. Interval scale was used to measure quantity of crops, livestock and income produced/earned by each farmer and scores were assigned. Mean score was calculated and it was used to classify farmers' level of crop and livestock production as well as annual income.

With regards to material possession, the material items farmers had and their weights were adapted from previous studies (Akinbile, 1997 and Yahaya, 1995). Standard scores of validated items were calculated using sigma-scoring method to arrive at the weight of each item. The total score of material possession for each farmer was calculated as well as the average. A farmer whose performance under each of these variables of crop production, livestock production, annual income and material possession was above the average was classified as high level and those below average as low. Descriptive statistics such as frequency,

percentage, mean as well as standard deviation were used to analysis the data collected.

RESULTS AND DISCUSSION
Farmers' accessibility to rehabilitation programme

The study reveals that few (19.3%) farmers had access to rehabilitation support programme provided by Osun State Government, affected Local Governments and NGOs when the violent conflict stopped. As shown in Table 1 farmers ranked provision of building material ($\bar{x}$ =1.76) the most important to them, followed by provision of shelter for displaced people ($\bar{x}$ =1.75) and 3rd position to provision of drugs/dressings ($\bar{x}$ =1.74). The implication of this finding is that conflict victims in the State preferred relief materials for housing, shelter for displaced victims and medication. The Table also shows that vast majority (81.72%) of the few farmers that had access to rehabilitation programme had low level of rehabilitation support. This low level of access to rehabilitation support by few conflict victims is likely to impact negatively on the post-conflict livelihoods of farmers in the state.

Table 1: Distribution of farmers based on accessibility to rehabilitation programme and its level of importance

Type rehabilitation support	Very important	Important	Not important	Mean
1.Capacity building	69.1	30.9	0.0	1.69
2.Supply of farm inputs (seed, agro- chemicals, fertiliser etc)	52.7	47.3	0.0	1.53
3.Provision of credit	66.0	33.0	1.0	1.65
4.Provision of household materials	62.2	35.7	2.1	1.60
5.Provision of building materials	77.8	20.0	2.2	1.76
6.Provision of food items	71.8	26.5	1.7	1.70
7.Provision of drugs/dressings	76.0	21.4	2.6	1.74
8.Provision of shelter for displaced people	77.1	21.2	1.7	1.75
Level of accessibility to rehabilitation programme	Frequency	Percentage		
Low (0.00 - 10.42)	24	81.7		
High (10.43- 16.00)	5	18.3		
Total	29	100.0		

Source: Field survey, 2017

Livelihood outcome (crop and livestock production and material possession)

Crop production - Table 2 shows that the farmers' average crop output in 2003 in tonnes was 3.88 for maize, 2.47 for yam, 5.26 for cassava and 2.67 for cocoa while, in 2016 the mean output in tonnes was 2.95, 2.46, 7.72 and 2.33, respectively. Comparing the crop output in 2003 and 2016 shows that average yield of cassava and citrus increased in 2016 at the rate of 46.77% and 13.41%, respectively, while, for other crops (maize, yam, cocoa and kola), it declined. The implication

of this finding is that generally crop production in the study area was better in 2003 than in 2016. Perhaps the decline of crop output in 2016 was due to high cost and scarcity of fertilisers, a vital farm input for crop production. The finding of this study is consistent with Bolarinwa (2007) who reported (data collected in 2003) the mean yield of 3,966kg and 6,718kg for maize and cassava, respectively for the core conflict area of Ife-Modakeke.

Level of crop production - The result in Table 3 reveals that 66.4% of the respondents had low level of crop production in 2003, while 33.6%

of the farmers had high level of crop production for the same year. However, in 2016, 73.7% of the farmers had low level of crop output, while 26.3% of the farmers recorded high level of crop output for the same year. The implication of this finding is that crop output recorded by farmers was lower in

2016 than in 2003. The low crop output in 2016 may be attributed to high cost of farm inputs which may prevent farmers from using recommended rate of input. Low crop output is likely to impact negatively on farmers post-conflict livelihoods.

Table 2: Distribution of farmers by average crop production

Crop	Average output (tonne)		
	2003	2016	Percentage change
1.Maize	3.88	2.95	-23.97
2. Guinea corn	0.00	0.00	0.00
3. Yam	2.47	2.46	0.00
4. Cassava	5.26	7.72	46.77
5. Cocoa	2.67	2.33	-12.73
6. Kola	1.90	1.32	-43.94
7. Citrus	0.82	0.93	13.41

Table 3: Distribution of farmers based on level of crop production

Level	2003		2016	
	F	%	F	%
Low	79	66,4	98	73.7
High	40	33.6	35	26.3
Total	119	100.0	133	100.0

Mean = 3.53±1.56 Maximum = 16.22 Minimum = 0.00
Source: Field survey, 2017

Livestock production

Table 4 shows that the average livestock output in 2003 was 5.00 for cattle, 12.33 for sheep and goat, 374.07 for poultry bird and 6,543.75 crates for egg as against 9.50, 26.22, 657.27 and 14,622.50, respectively in 2016. The figures show that the mean output for all livestock enterprises viz cattle, sheep and goat, poultry bird and egg increased in 2016 when compared with 2003 at the rate of 90.0%, 112.7%, 75.7% and 123.46%, respectively. The implication of this finding is that farmers recorded increase in all their different enterprises of livestock in 2016 when compared with 2003 with egg production giving the highest increase. This may be due to improved

management practices including disease control undertaken by farmers during post-conflict in the study area.

Level of livestock production

Table 5 reveals that 68.2% of the farmers had low level of livestock production in 2003, while 72.1% of the farmers had high level of livestock production in 2016. The implication of this finding is that livestock output was higher in 2016 when compared with 2003. The low livestock output recorded by farmers in 2003 in the study area could be attributed to the conflict since farm produce including animals were destroyed during the crisis.

Table 4: Distribution of farmers by average livestock production

Enterprises	Average output (Number)		
	2003	2016	Percentage change
1.Cattle	5.00	9.50	90.00
2.Sheep and Goat	12.33	26.22	112.65
3.Poultry birds	374.07	657.27	75.71
4.Eggs (in crates)	6,543.75	14,622.50	123.46

Source: Field survey, 2017

Table 5: Distribution of farmers based on level of livestock production

Level	2003		2016	
	F	%	F	%
Low	30	68.2	12	27.9
High	14	31.8	31	72.1
Total	44	100.0	43	100.0

Mean = 1.86±1.51 Minimum = 0.00 Maximum = 13.17
Source: Field survey, 2017

Material possession

Table 6 shows the material possession of the respondents in the study area delineated into large, medium and small household items. With respect to large household items, 58.0% and 21.3% of the respondents possessed other homes in village and house in city, respectively in 2003, while in 2016 it was 44.7% and 29.4%, respectively. As for the percentage change, functioning deep well with pump and house in city increased by 149.2% and 38.2%, respectively in 2016 when compared with 2003. With respect to medium household items, 84.7%, 80.7%, 23.3% of the respondents possessed radio cassette player, wooden bed with mattress and motorcycle, respectively in 2003, while in 2016, 95.3%, 83.3%, and 26.5% of the respondents possessed radio cassette player, wooden bed with mattress and motorcycle, respectively. Percentage increase of 73.2.4%, 48.5%, 44.5% and 32.7% was recorded for grinders, cushioned executive chairs, refrigerator and personal generator, respectively. In the case of small household items, 68.7%, 42.0% and 32.7% of the respondents possessed cooking stove, glass plates and bicycle, respectively in 2003, while in 2016, the percentage was 73.3%, 54.7% and 35.5%, respectively. The Table further shows that the percentage of respondents who possessed glass plates in 2016 increased by 30.2% when compared with 2003, whereas pit latrine decreased by -37.8%.

Table 6: Distribution of farmers based on material possession

Type of material	(%) n=150		
	2003	2016	% Change
A Large household items			
1. Storey building in village	6.7	4.7	-29.6
2. Other homes in village	58.0	44.7	-22.9
3. House in city	21.3	29.4	38.2
4. Functioning vehicles	4.7	5.0	6.7
5. Milling machines	8.7	8.7	0.0
6. Deep well with pumping machine	6.3	15.7	149.2
7. Size of farm (ha)	6.6	4.5	-31.8
B Medium household items			
8. Wooden bed with mattress	80.7	83.3	3.2
9. Cushioned executive chairs	10.7	15.9	48.5
10. Dining table	6.1	6.9	13.1
11. Floor rug	4.0	4.7	16.7
12. Refrigerator	3.7	5.3	44.5
13. Ceiling/Table/Standing fan	12.3	14.1	14.9
14.Television	10.6	12.8	20.7
15. Radio cassette player	84.7	95.3	12.5
16. Personal generator	8.5	11.3	32.9
17. Motorcycle	23.3	26.5	13.9
18. Grinders	12.7	22.0	73.2
19. Toilet with water system	3.5	4.1	17.7
20. Well	6.3	7.1	13.1
C Small household items			
21. Pit latrine	4.5	2.8	-37.8
22. Bicycle	32.7	35.5	8.5
23. Electric stove	2.7	2.8	4.6
24. Cooking stove	68.7	73.3	6.7
25. Glass plates	42.0	54.7	30.2

Source: Field survey, 2017

The implication of this finding is that more farmers were able to possess material items in 2016 when compared with 2003. Perhaps the respondents had higher annual income in 2016 as improved income normally afford people the opportunity to purchase more household materials.

Level of material possession

Table 7 reveals that 53.3% of the respondents had low material possession in 2003 while in 2016, 64.7% of the respondents had high material possession. The implication of this finding is that the proportion of farmers who had high level of material possession was higher in 2016 than in 2003. This improvement in the material possession of farmers in 2016 is likely to impact positively on the post-conflict livelihoods of farmers in the study area.

Table 7: Distribution of farmers based on level of material possession

Level	2003		2016	
	F	%	F	%
Low	80	53.3	53	35.3
High	70	46.7	97	64.7
Total	150	100.0	150	100.0

Source: Field survey, 2017

Livelihood change (level of crop and livestock production, material possession and per capita expenditure)

Components of livelihood change

The result of analysis in Table 8 reveals that the mean crop production scores were 3.65 and 3.34 for 2003 and 2016, respectively. Percentage change in level of crop production over the period was -8.49%. The reduction of crop output during post-conflict period could be attributed to loss of land due to conflict, outbreak of diseases and pests, poor access to loan and high cost/scarcity of essential farm inputs especially fertilisers.

With respect to livestock production, the Table further reveals that the mean scores were 2.08 and 2.26 for 2003 and 2016, respectively. Percentage change in level of livestock production between 2003 and 2016 was 8.65%. The increase in livestock production during post-conflict period could be due to adoption of improved management practices including disease control by farmers. The increase in livestock output is expected to translate into improved post-conflict livelihoods of the farmers.

The Table also shows that the average scores for material possession were 3.14 and 3.32 in 2003 and 2016, respectively. Meanwhile, the change in level of material possession between 2003 and 2016 was 5.73%. This implies that there was improvement in the quantity of household items possessed by farmers in 2016. May be farmers recorded higher income in 2016 as better income is expected to positively influence material possession.

The Table further reveals that the mean Per Capita Expenditure (PCE) scores of respondents were 2270.73 and 2782.10 for 2003 and 2016, respectively. Meanwhile, the percentage change in respondents' annual PCE between 2003 and 2016 was 22.52%. The higher PCE recorded by farmers in 2016 when compared with 2003 could have been influenced by improved income because when people earn more income there is the propensity to spend more.

Livelihood change of farmers in this study was measured by the average percentage change in the level of change across variables of crop production, livestock production, material possession and per capita expenditure. In this regard, Table 8 further shows that livelihood change of farmers in the study area was 7.10% between 2003 (conflict de-escalation) and 2016 (post conflict).

The implication of this result is that farmers' post-conflict livelihood change was positive indicating that livelihoods of farmers in the study area witnessed improvement in 2016 (post-conflict) when compared with 2003 (conflict de-escalation). Albeit the livelihood change is low, it is an indication that farmers in the study area are gradually recovering from the trauma and losses they suffered during the violent conflict. Thus, post-conflict economic recovery has taken place in the study area. The main drivers of post conflict economic recovery include the rehabilitation of infrastructure, reinvesting in human capital, reintegration of ex-combatants and special groups, securing economic opportunities and creating jobs, strengthening local institutions and mediating access to financial resources (UNDP, 2008).

Level of livelihood change

Table 9 reveals that 57.3% of the farmers had low livelihood change, while 28.0% had high change. Meanwhile, 14.7% of the farmers had negative change. This finding implies that majority (72.0%) of the farmers had poor livelihood change. Low level of rehabilitation support to conflict victims as well as production challenges faced by farmers which include poor access to credit, high cost of farm inputs and poor market for farm produce may be responsible for the low level of livelihood change among the farmers.

Table 8: Post conflict livelihood change of farmers

Variable	2003 Mean score	2016 Mean score	% Change
Crop production	3.65	3.34	-8.49
Livestock production	2.08	2.26	8.65
Material possession	3.14	3.32	5.73
Mean PCE	2270.73	2782.10	22.52
Livelihood change			**7.10**

Source: Field survey, 2017

Table 9: Distribution of farmers based on level of livelihood change

Level of change	F	%
Negative	22	14.7
Low	86	57.3
High	42	28.0
Total	150	100.0

Mean 76.62±107.48 Minimum -26.57 Maximum 926.41
Source: Field survey, 2017

CONCLUSION AND RECOMMENDATIONS

The paper concluded that farmers' accessibility to rehabilitation support programme was too low and majority of the few farmers that accessed the rehabilitation programme had low level of rehabilitation support. Substantial increase in livestock production was recorded during post-conflict while, crop output declined. Post-conflict livelihood change was very low in the study area. The paper therefore recommended that rehabilitation support programme from governments and NGOs for conflict victims should be based on need assessment of conflict victims and the quantity as well as quality of the relief materials/farm inputs should be reasonably high and timely so that the rehabilitation programme could be effective and make the desired impact on the livelihoods of the affected farmers. Osun State Government as well as Local Governments in Ife-Madakeke area should find a way of rendering further assistance to the conflict victims in Ife-Modakeke communities.

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EXTENSION AGENTS' COMPETENCY NEEDS IN RURAL DEVELOPMENT ACTIVITIES IN SOUTHWEST NIGERIA

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ABSTRACT
The study identified and prioritised the competency needs of extension agents in rural development activities. The study determined the levels of knowledge and skills of extension agents in rural development activities, their competency needs in rural development activities and prioritised the identified needs based on available opportunities in the job environment to practise the competency. The study was carried out in southwest Nigeria. Lagos, Oyo and Ondo States were randomly selected for the study. A proportionate sample of 85% of the agents with the Agricultural Development Programmes (ADPs) in the States sampled was selected to give a total of 382 respondents for the study. Data were collected using questionnaire and analysed using descriptive statistical tools while Criticality Function Model was adapted to identify the competency gaps. Findings of the study revealed that the knowledge of the agents was highest in encouraging adoption of agricultural technologies ($\bar{x}$= 3.48) but lowest in understanding gender/vulnerable group in development ($\bar{x}$= 2.12). Also, the skill of the agents was highest in community organisation and group dynamics ($\bar{x}$ = 3.01) but lowest in triangulation using rural appraisal tools ($\bar{x}$ = 2.23). Community driven development approach, understanding gender/vulnerable issues in development and triangulation using participatory rural appraisal tools were among the leading competency needs from the low knowledge/low skill quadrant while community driven development approach ($\bar{x}$ = 3.41), planning for social safety net ($\bar{x}$ = 3.29), and use of participatory rural appraisal tools ($\bar{x}$ = 3.26) ranked highest respectively on the priority list of identified competency needs. The study concluded that the job environment of the agents does not provide equal opportunities to practise the identified needs. The study recommended that in planning for capacity development of agents on rural development, competency needs favoured by available opportunity for use within the job environment should be prioritised.
Keywords: Competency needs, Extension agents, Criticality Function Model, Agricultural Development Programmes (ADPs)

INTRODUCTION

The concept of rurality is very complex to define. This complexity in defining the concept had made it impossible to have a universally acceptable definition. However, experts in the related fields had tried to paint a graphical picture of what rural area is in nearly every continent and nations of the world. In Nigeria, Ekong cited in Alfred (2011) described the city as where bright lights are found, where the tempo of life is fast and where all good things of life are in abundance but the village or the rural area as those with opposite the attributes of the city life. Many Nigerians considered rural areas as places given to agricultural production. Late Professor Joseph Ade Alao, the first president of Nigerian Rural Sociological Association, one of Nigeria foremost rural sociologist while delivering a lecture in a rural sociology class, submitted that rural area in Nigeria is a place where small ruminants and poultry of all kinds can sleep on the main roads for hours without vehicular disturbance. Rural area in Nigeria could therefore be considered as places with less than 20, 000 people as well as those with larger population but in which a greater proportion of the inhabitants (50 per cent or more) are engaged in farming and equally lacking in most of the basic infrastructures like electricity supply, police and fire services, pipe-borne water, branches of commercial banks and ten or more post primary schools among others (Ekong cited in Alfred 2011).

According to a sub-regional workshop on rural development in Africa as cited in Alabi *et al* (2019), rural development is considered as 'a process by which a set of social, technical, institutional and cultural measures are put in place in association with and for the inhabitants of rural areas for the purpose of improving their achieve harmony and balance both on the regional and national levels'. South African Rural Development Framework as cited in Nwachukwu and Ekanem (2011) defined rural development as 'helping rural people set the priorities in their own communities through effective and democratic bodies, by providing the local capacity investment in basic infrastructure and social services; justice, equity and security; dealing with the injustice of the past and ensuring safety and security of the rural population especially that of women'. Furthermore, Williams cited in Adeokun, Oladoja and Olanloye (2011) opined that rural development 'involves the transformation of rural community into a socially, educationally, economically, politically, orderly and materially desirable condition with the purpose of improving the quality of life of the rural population'.

Agricultural extension is one of the approaches that had been tried to achieve rural development (Williams cited in Adeokun, Oladoja

and Olanloye, 2011). The focus of agricultural extension is to bring about increased agricultural productivity by stimulating farmers to use modern and improved scientific production technologies developed through research (Van den Ban and Hawkins cited in Alabi, 2014). Agricultural extension seeks to improve the knowledge and skill of farmers in agricultural production and also seeks to inculcate the right attitude in farmers towards agricultural development. This approach to rural development is limited in that agricultural development on its own will not translate into rural development because though agriculture is the predominant activity in the rural area, yet it will take a concerted effort across different sectors of the rural life to bring about rural development.

Also, the extension agents who are the foot soldiers of agricultural extension organisations are somehow limited in their knowledge and skill in rural development activities. Many of the extension agents working in the field of agricultural development had no background in agricultural extension or rural sociology (Alabi, 2014). Even for those with background in agricultural extension and rural sociology, the curriculum of their pre-service trainings never contained many of the recent concepts in rural community development. Although agricultural extension organisation and agricultural extension agents are the closest to rural development among the government agencies and workers because of the vantage position they occupy in agricultural development, their insufficient knowledge and skill in many of the international donor agencies tested and approved rural development competencies might limit their relevance in the rural development space. This implies that the human capital of the extension agents needs to be developed along the line of rural development to give them a competitive advantage in ensuring rural development.

Rastogi cited in Gogan (2014) opined that human capital could be recognized as an important requirement for employees' continuous improvement on knowledge, skills and abilities. Also, human capital focuses on the economic behaviour of individuals especially in the way their accumulation of knowledge and skills empowers them to improve their productivity and income and by so doing increase the efficiency and the wealth of the societies in which they live (Schuller cited in Njideka, 2011). This implies that the investment of education and training could help improve the knowledge and skill of the extension agents in these modern activities that lead to rural development, however, appropriate needs analysis that reveals accurate performance gaps is needed to give the training direction and ensure its success (Williams cited in Alabi, 2014).

Furthermore, as Fructchery cited in Alabi (2014) opined, identifying performance needs

alerts the trainees to where they are on the continuum of what is and what ought to be and create in them a willingness to maximise the opportunity that training programme affords to learn and close the gap. The work environment of the extension agents should also be considered in determining the contents of training programmes so as not to keep developing in them the competence that the work environment do not provide opportunity for them to practice. If this is not considered, the entire training process and the investment in time and energy of the trainees will not amount to much. Based on the followings, the study therefore, sought empirical answers to the following research questions: how knowledgeable and skilful are the extension agents in rural development activities in southwest Nigeria? What are the competency needs of the extension agents in rural development activities? What are the opportunities available in the work environment of the agents to practise the competencies in rural development activities in southwest Nigeria?

The broad objective of the study is to determine the competency needs of extension agents in in rural development activities in southwest Nigeria. The specific objectives are to:

1. determine the levels of knowledge and skill of the extension agents in rural development activities in southwest, Nigeria;
2. determine the competency needs of the agents in rural development activities in southwest, Nigeria; and
3. prioritise the identified competence needs based on the opportunities available in the agents' work environments to practise the activity.

METHODOLOGY

The study area is the southwest geopolitical zone of Nigeria. The zone covered latitude 60^0 north to latitude 40^0 south and was marked by longitude 40^0 west to longitude 60^0 east. The zone comprised of the states of Ekiti, Ondo, Osun, Oyo, Ogun and Lagos with a combined population of 27, 722, 432 people according to 2006 population census (NBS, 2011). The population of the study comprised of all the extension agents in the service of Agricultural Development Programme (ADP) in all the southwest states of Nigeria.

The sampling procedure for the study followed a multi-stage sampling approach. At the first stage, Ondo, Lagos and Oyo states were randomly selected. The total number of the agents in the selected states was 490 (150 in Lagos, 160 in Ondo and 180 in Oyo states). At the second stage, 85 per cent of the agents in each of the states were proportionately selected. The total extension agents selected for the study was 415 (126 in Lagos, 136

in Ondo and 153 in Oyo states respectively). At the third stage, all the extension agents selected were given a copy of the study questionnaire but only 382 copies were returned which gave a 92 per cent return rate.

The questionnaire for the study comprised of three sections: socioeconomic characteristics of the agents, levels of knowledge and skill in selected rural development activities and opportunity to put the selected rural development activities to work in the work environment. Selected socioeconomic characteristics of the extension agents such as age, years of formal education, year of experience on the job, number of farmers/farm families covered and income per month were measured in their absolute numbers as supplied by the agents. Eleven activities important to rural development were identified through desk study (Abdul-Rahim; and Shibah cited in Alabi 2014).

The knowledge and skill of the extension agents in these activities were measured on a Likert type scale of 1 to 5 with 1 being No knowledge/No skill and 5 being Very high knowledge/Very high skill. The level of knowledge and skill of the agents were categorised using the mean values into No knowledge/No skill ($\bar{x}$= 1-1.49), Little knowledge/Little skill ($\bar{x}$ = 1.5-2.49), Moderate knowledge/Moderate skill ($\bar{x}$ = 2.5-3.49), High Knowledge/High skill ($\bar{x}$ = 3.5-4.49) and Very high knowledge/Very high skill ($\bar{x}$ = 4.5-5.0) according to Ajayi and Alabi (2012) and Alabi (2014). Data collected were summarised using frequency, mean and standard deviation while Criticality Function model (Hershkowitz, cited in Agbamu, 2017) was adopted to identify the competence gaps of the agents in rural development activities.

The Criticality Function Model was operationalized thus: first, an overall mean score is calculated for knowledge and skill on the rural development activities. Then, the mean knowledge score is plotted on the Y axis and the mean skill score is plotted on the X axis. Perpendicular lines are then drawn from each of these points, resulting in a 2 x 2 matrix. The matrix has four quadrants-high knowledge-high skill (HH), high knowledge-low skill (HL), low knowledge-high skill (LH), and low knowledge-low skill (LL). Furthermore, the mean scores for knowledge and skill of each of the rural development activities were plotted in the matrix. Those falling in the low knowledge-low skill (LL) are those with the highest competency needs.

The opportunity to practise the selected rural development activities in the work environment was also measured on a 5 point Likert type scale with 1 being 'No opportunity to practise' and 5 being 'very great opportunity to practise'.

RESULTS AND DISCUSSIONS
Selected socioeconomic characteristics

Result presented in Table 1 reveals the descriptive statistics of the selected socioeconomic characteristics of the extension agents in southwest, Nigeria. The findings of the study revealed that the mean age of the respondents was 39.3 years. The youngest extension agent sampled was 24 years and the oldest was 59 years. This finding corroborates Alabi and Ajayi (2017) who had earlier reported that average age of extension agents in Osun State in southwest Nigeria was 40.17$\pm$7.6 years. This shows that the extension agents in southwest Nigeria are relatively young and therefore possess the required strength to cope with the rigours of field activities requisite for success in their work. The average year of formal education of the agents was 17 years. This translates to a Higher National Diploma degree or a Bachelor of Science degree.

The minimum year of formal education was 13 meaning some extension agents might have been employed with the secondary school certificate. The maximum year of formal education of the agents was 28 years. This will automatically translate to the fact that some of the extension agents in southwest Nigeria had higher degrees in their respective specializations. Also from the table, the mean year of work experience of the agents was 10 years while the minimum was 4 years and the maximum was 33 years. The implication of this is that many of the agents had put in about a decade of service into the organisation they work with. This length of time could have a positive influence on their performance.

Furthermore, the average number of farmers/farm families covered by the extension agents was 585 people in a year. The maximum number recorded for an agent was 1500 people while the minimum was 287 people in a year. This is against the Food and Agricultural Organisation (FAO) standard of one extension agent to 250 farmers. The monthly income of the respondents as presented in the table revealed an average monthly income of ₦60, 274 for the extension agents in southwest Nigeria. This translates to approximately 171 dollars per month.

Table 1: Descriptive statistics of selected socioeconomic characteristics of the extension agents

Variables	Minimum	Maximum	Mean
Age in years	19.00	59.00	39.28
Years of formal education	13.00	28.00	16.44
Length of service in years	4.00	33.00	10.34
Number of farmers/farm families covered by agent	287.00	1500.00	584.67
Monthly salary	₦10000.00	₦120000.00	₦60274.00

Level of knowledge of extension agents in rural development activities

Result in Table 2 reveals the mean values of knowledge of extension agents in selected rural development activities. Further Categorisation revealed that extension agents in Southwest Nigeria had moderate knowledge in 4 of the rural development activities listed while they had little knowledge in the remaining 7 activities. From the Table, extension agents recorded the highest activity mean score in encouraging adoption of agricultural technology ($\bar{x}$ = 3.48) followed by community organisation and group dynamics ($\bar{x}$ = 3.26). This result revealed that extension agents had insufficient knowledge in most of the rural development activities listed. As expected, most of the rural development activities listed is outside the mainstream extension activities in the country as they were not part of the curriculum for the pre-service training of the extension agents but now form crucial part of many internationally funded community developmental programmes and projects.

Considering the activities with the highest mean scores, it could be concluded that extension agents' high knowledge in encouraging adoption of agricultural technology is expected since the main focus of extension service is the improvement of agriculture by encouraging farmers to adopt better ways (technologies) of doing what they do. Also, since extension works with clientele in groups, the high score value in community organisation and group dynamics could be justified. The least mean scores were recorded in the activities: community driven development approach and understanding gender/vulnerable group issues ($\bar{x}$= 2.12). These findings imply extension agents' dearth of knowledge in rural development activities.

Table 2: Level of knowledge of extension agents in rural development activities

Rural development activities	Mean scores			
	Oyo ADP	Lagos ADP	Ondo ADP	Southwest ADP
Encouraging adoption of agricultural technology	3.16	3.85	3.43	3.48
Use of social mores and tradition in development work	2. 94	3.18	3.39	3.17
Utilising local leaders in rural development work	3.21	2.98	3.33	3.17
Use of participatory rural appraisal tools	2.48	2.38	2.37	2.41
Triangulation using qualitative data collection methods	2.52	2.53	2.27	2.44
Understanding gender/vulnerable group issues in development	2.08	2.15	2.14	2.12
Mainstreaming gender/vulnerable group in development activities	2.24	2.18	2.19	2.20
Community organisation and group dynamics	3.02	3.49	3.27	3.26
Community driven development approach	2.18	2.18	2.14	2.12
Planning for social safety net	2.28	2.37	2.28	2.31
Implementing social safety net	2.71	2.66	2.41	2.59

Level of skill of extension agents in rural development activities

Results in Table 3 reveals the mean scores of skill of extension agents in Southwest Nigeria in the rural development activities listed. Extension agents in Southwest Nigeria had moderate skill in five of the eleven rural development activities listed. As seen in the table, extension agents only recorded mean value greater than 3.00 in just one activity, community organisation and group dynamics ($\bar{x}$= 3.01). This is an indication that extension agents in the region had little skill in managing rural development activities. Specifically, the findings of the study show that they had less than 2.50 mean score in six of the listed rural development activities. The results of the study imply that extension agents in Southwest Nigeria possess inadequate skill in directing the activities that could bring about rural development in the study area.

Table 3: Level of skill of extension agents in rural development activities

Rural development activities	Mean scores			
	Oyo ADP	Lagos ADP	Ondo ADP	Southwest ADP
Encouraging adoption of agricultural technology	2.94	2.54	3.19	2.89
Use of social mores and tradition in development work	2.86	2.83	3.13	2.94
Utilising local leaders in rural development work	2.97	2.49	3.11	2.86
Use of participatory rural appraisal tools	2.45	2.36	2.30	2.37
Triangulation using qualitative data collection methods	2.27	2.20	2.23	2.23
Understanding gender/vulnerable group issues in development	2.48	2.50	2.52	2.50
Mainstreaming gender/vulnerable group in development activities	2.43	2.31	2.44	2.39
Community organisation and group dynamics	3.10	2.75	3.17	3.01
Community driven development approach	2.45	2.38	2.63	2.49
Planning for social safety net	2.43	2.38	2.48	2.43
Implementing social safety net	2.51	2.38	2.55	2.48

Competency needs of extension agents on rural development activities

Based on the 2 x 2 matrix generated by the grand mean scores of knowledge and skill of the extension agents in rural development activities, nine out of the 11 rural development activities were in the low knowledge-low skill (LL) quadrant. This is presented in Figure 1. These findings reveal that nine rural development activities portray areas of competency needs for the extension agents in rural development in southwest, Nigeria. Some of the activities are community driven development approach, understanding gender/vulnerable group issues in development, mainstreaming gender/vulnerable groups in development activities, planning for social safety nets, use of participatory rural appraisal tools and triangulation using qualitative methods in development data gathering and implementing social safety nets. Others are utilising local leaders in rural development issues and role of social mores and tradition in community development work.

Going by the mean scores of the activities presented in the LL quadrant, extension agents in southwest Nigeria still recorded better scores in utilising local leaders in rural development issues and the role of social mores and tradition in community development work, although both activities still fell into the LL quadrant. This implies that if extension agents will be able to contribute more meaningfully in the ever widening rural development space, their proficiency in these identified competency needs must be improved. One of the ways to improve human capacity is training. Therefore, training extension agents on these identified rural development activities will go a long way in having positive implications on their jobs and on rural community development in general.

Prioritization of identified competency needs based on opportunities in the job environment to practise the competences

Result presented in Table 4 reveals the mean scores of the respondents perceived opportunities in the work environment to practise the identified competency needs. Result presented in Table 4 showed that community driven development approach ($\bar{x}$= 3.41) ranked first on the list. This implies that the job environment of the agent provides opportunity for them to put to practise the said competence. Planning for social safety net and implementing social safety net ($\bar{x}$= 3.29) ranked second on the list. This means that the agents perceived opportunities in their work environment to practise these competencies as available. Furthermore, use of participatory rural appraisal tool ($\bar{x}$= 3.25) was the next competence on the list. This also implies that the agents perceived their job environment offering opportunities to practise the said competency.

The last competence on the list is mainstreaming gender/vulnerable groups in developing activities ($\bar{x}$= 3.14). The priority list of the competencies showed that the work environment of the agents is more favourable to practising some competencies than others. This implies that when organising training to improve the human capital of the agents in rural development related activities, emphasis should not just be on the identified competencies but importance should also be attached to the various opportunities in the work environment of the agents to practise the competencies they are to be trained on to maximise the return on investment of such training programmes.
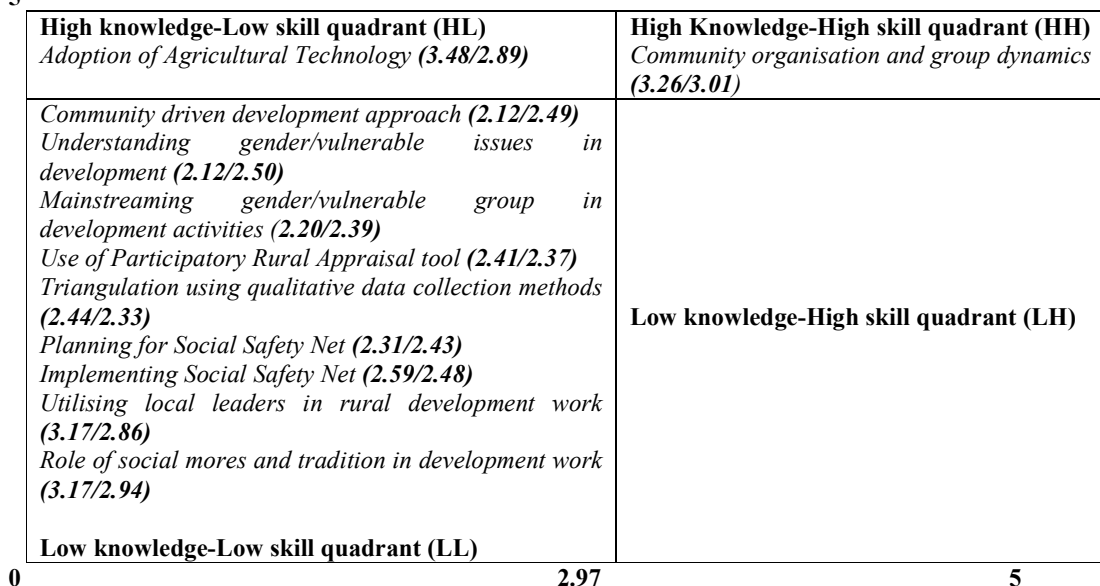
5

High knowledge-Low skill quadrant (HL) *Adoption of Agricultural Technology (3.48/2.89)*	High Knowledge-High skill quadrant (HH) *Community organisation and group dynamics (3.26/3.01)*
Community driven development approach (2.12/2.49) *Understanding gender/vulnerable issues in development (2.12/2.50)* *Mainstreaming gender/vulnerable group in development activities (2.20/2.39)* *Use of Participatory Rural Appraisal tool (2.41/2.37)* *Triangulation using qualitative data collection methods (2.44/2.33)* *Planning for Social Safety Net (2.31/2.43)* *Implementing Social Safety Net (2.59/2.48)* *Utilising local leaders in rural development work (3.17/2.86)* *Role of social mores and tradition in development work (3.17/2.94)* **Low knowledge-Low skill quadrant (LL)**	**Low knowledge-High skill quadrant (LH)**

0   **2.97**   **5**

Figure 1: 2 x 2 matrix showing quadrants revealing the competency needs

Table 4: Priority list of the identified competency needs based on opportunity in the work environment to practise the competences

Rural development competencies	Mean	Rank
Community driven development approach	3.41	1st
Planning for social safety net	3.29	2nd
Implementing social safety net	3.29	2nd
Use of participatory rural appraisal tools	3.25	4th
Triangulation using qualitative data collection methods	3.15	5th
Understanding gender/vulnerable group issues in development	3.15	5th
Mainstreaming gender/vulnerable group in development activities	3.14	7th

CONCLUSION AND RECOMMENDATIONS

The knowledge of the extension agents in southwest Nigeria was highest in encouraging adoption of agricultural technologies and lowest in understanding community driven development approach. Also, the skill of the agents was highest in community organisation and group dynamics and lowest in using rural appraisal tools. Furthermore, the competency needs of the extension agents in rural development activities in southwest Nigeria includes understanding community driven development approach, understanding gender/vulnerable group issue in development and planning for social safety net among others.

The priority list of identified competence needs produced community driven development approach, planning for social safety net and use of participatory rural appraisal tools in descending order revealing the available opportunities in the work environment of the agents to practise the competencies. Based on the conclusions of the study, the study recommends that the in-service training programmes for the extension agents in rural development activities should focus on the identified competence needs with greater importance attached to the competences on the priority established based on available opportunities in the work environment of the agents to practise them.

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DETERMINANTS OF FARM SUCCESSION PLAN AMONG CATTLE FARMERS IN KEBBI STATE, NIGERIA

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ABSTRACT

The study assessed the determinants of farm succession plan among aged cattle farmers in Kebbi State of Nigeria with a view to establishing the potential of continuity and sustainability of generational cattle rearing for enhancing rural livelihoods. The study described the socioeconomic characteristics of respondents; investigated the cattle rearing activities in which the respondents are involved and their level of involvement; and investigated how respondents plan for succession and determined the factors influencing respondents' succession plan. A Multistage sampling procedure was employed to select 240 respondents. Analyses were done using descriptive (frequency count, percentages, mean and standard deviation) and inferential statistics, (such as Pearsons' product moment correlation). The mean age of respondents was 67.1 years with 77 per cent literacy in Arabic and Hausa languages. About 98 per cent indicated that they have already identified a successor for the farm with a succession plan. Many (95%) of the respondents are willing to retire, with low involvement in cattle rearing activities. The mean for succession was 13.96 and 90.8 per cent of the respondents had involved their identified successor into their succession plan process. There was a significant relationship between their flock size (r=0.140), age (r=0.162), experience (r=0.162: p=0.012) and respondents' succession plan. The major determinants of farm succession plan were; age, income, flock size, household size, level of education, years of experience and favourable attitude towards succession There was a high consideration for succession plan among cattle rearers, and it was recommended that issues of farm succession plan be strategically integrated into cattle rearing policies at all levels of government.

Keywords: Farm succession plan, Involvement, Cattle farmers, livelihoods

INTRODUCTION

Agriculture was the major driver of Nigeria's economy before the advent of oil exploration in 1956. Until recently the sector was the leading employer, employing about 75% of the rural population (Onlinenigeria, 2016). It has significantly contributed to the overall country's gross domestic products (GDP) with about 40%, which on the other hand, contributed to about 88% of non-oil revenues. About 85% of the shares are from crop production, with 10% from livestock industry, 4% from aquaculture and 1% from forestry (Onlinenigeria, 2016).

According to Federal Ministry of Agriculture and Rural Development (2016) Nigeria has 13 million cattle, 35 million goats, 22 million sheep and 80-120 million poultry birds. The cattle production industry has become a security threat; this is because of over dependence of its value chain on a network of nomadic herdsmen with most of these animals entering a brief fattening period before slaughtering and processing. The supply chain has been facing serious constraints, ranging from inefficiency to high security threat, as these animals' roam from place to place in search of pasture causing a great friction between herdsmen and land owners (FMARD, 2016).

The United Nations estimated that about 10% of the global population of over 962 million people are over 60 years of age; these figures are expected to rise by 2050 (United Nations, 2017). Ageing is the constant increase in number of elderly persons of a country over time. It is a socio-economic constraint in Africa and about two-third of these senior citizens live in third world countries, where there are hardly formal plans for the support of aged people. This makes them to stay longer in business or jobs without a plan to transfer to the future generation.

Nigeria is one of the fastest economies in Africa that is not left out of the multiplier effect of ageing, which diminishes the capacity of its people to work and earn. This is more felt in the agricultural sector (Fasina and Inegbedion, 2014). They also argued that the sector is the most important sector of the economy, in terms of job creation, food security, and fibre and foreign exchange earnings. Productivity determinant in this sector is age. As the elderly farmer continues to work on his farm at a rate at which the law of diminishing returns sets in, there is an inverse relationship between the age of the farmer and his productivity (Fasina and Inegbedion 2014).

The cattle rearing industry in Nigeria is a vital subsector in the agricultural sector and one

which requires huge amount of initial capital to setup. The possession of capital is unarguably accumulated over the years and could mean that the aged cattle farmers by virtue of their long years of involvement would have accumulated the required capital. This category of farmers would have become psychologically and emotionally attached to their business, as it would have taken much of their physical and mental efforts in the course of business pursuit. These cattle farmers are thus faced with a dilemma as they grow older as to the decision on what happens to their farm investment and who takes over them and hence, the available options for them after their exit from active rearing. Previous literatures consulted led much emphasis on farm succession plans for instance Fasina and Inegbedion (2014) studied farm succession plans among poultry farmers in Ogun State. Stephanie (2005) looked at farmer retirement and transition planning in Virginia, her concern was how prepared Virginia farmers were about retirement, but not much has been done on determinants of farm succession plan among aged cattle farmers in Kebbi State. It is in view of this, the study seeks answers to the following questions;

1. What are the socio economic characteristics of the aged cattle farmers in the study area?
2. What are the cattle rearing activities the aged farmers are involved in?
3. What are their levels of involvement on cattle farming?
4. How the aged cattle farmers plan for succession?
5. What are the factors influencing their succession plan?

Hypothesis; There is no significant relationship between aged cattle farmers' succession plan and some selected socioeconomic characteristics.

METHODOLOGY

The study sample was drawn from rural communities in Kebbi State. The state was created on the 27th August 1991 and it's situated between latitudes 10^0 8'N- 13^0 15'N and 3^0 30'E-6^0 02'E. The state is bordered by Sokoto and Zamfara State to the east, Niger to the south, Benin Republic to the west and the Republic of Niger to the north. The state is divided into four agricultural extension zones namely; Argungu, Bunza, Yauri and Zuru zones. Zone one is made of seven Local Government Areas (LGAs), zone two comprises six LGAs, zone three comprises four LGAs and zone four comprises four LGAs making a total of 21 LGAs. The population of aged (60 years and above) cattle farmers in the state is said to be 5125 according to (Kebbi State Cattle Farmers Association, 2017). A multi stage sampling procedure was used to select respondents for the study. At the first stage, in each of the agricultural zones, two LGAs with high concentration of aged (60 years and above) cattle farmers were purposively selected to give a total of eight LGAs. At the second stage, three rural communities were purposively selected from each LGA, making a total of twenty-four rural communities. At the final stage, ten aged cattle farmers were purposively selected from each of the rural communities to give a total of 240 respondents. Data collected were subjected to appropriate descriptive and inferential statistical analysis (such as Pearsons Product Moment Correlation PPMC). The dependent variable (succession plan) was measured on a scale of 0-3, where 0= not at all, 1=rarely, 2=sometimes and 3= always.

RESULTS AND DISCUSSION
Socioeconomic characteristics

Result in Table 1 shows that majority (45.74%) of the aged cattle farmers were 65 years old with mean age of 67.17±5.468 and the implication is that, the cattle farmers are aged. This affirmed the United Nations' estimate of 10% of the global population of over 962 million aged people within 60 years under review , of which these figures are expected to rise by 2050 (United Nations, 2017). This is also an indication that no too many young people are into cattle rearing in Nigeria. This also agrees with Fagorusi (2017) assertion that the average age of Nigerian farmer is 55.5 years.

In addition, majority of the respondents (95.4%) were males, while 4.6 percent were females. This shows that, the male folks have dominated the population of cattle farmers in the study area. This is also gave credence to Agboola, Adekunle and Ogunjimi (2015) who noted that there were more males in vegetable farming than females because it involves time and high energy. Cattle farming also share the same attributes this is because of its capital intensive nature and it also requires high energy. This finding is also in harmony with Mohammed and Abdullquadri (2012) study, that gender inequality is noticed in Nigeria's agricultural sector and this constitutes a bottleneck to agricultural development.

The results also show that majority (100%) of the respondents were Muslim. This implies that modern religion has vastly taken over the communities in the study area and this could be as a result of trade between the Arabs and the presence of Islamic scholars.

Furthermore, majority (84%) of respondents were married. This shows that majority of the respondent were married and still living together.

In addition, majority (57.9%) of the respondents practice monogamous family that is having only one wife. This reveals the reason why

most of the respondents had an identified successor. This is because in polygamous family, the head of the household may find it difficult to identify any successor and this makes it difficult to discuss succession related issues.

The results in Table 1 further revealed that 48.8 percent of the respondents had a household size of about 11-20 members with a mean of 13.04±6.989.The reason for this large household size could be as a result of the value attached to children in the study area, because the respondents believe that, the larger the household size the higher would be their status in the community. The implication for this large household is it could affect succession plan decision of the aged cattle farmer. This is in contrast with the report of National Bureau of Statistics (2016), which says the average household size in rural areas is 5.9. This also agrees with Mgbokov, Ochiaka, Ugwu and Okorie (2014), who posited that the magnitude of agricultural production has been found to have a direct relationship with household size. Thus, the larger the household size, the more agricultural production.

Table 1: Distribution of aged cattle farmers by personal and demographic characteristics

Variables	Frequency	Percentage	Mean	Standard deviation
Age			67.17	5.46
65	109	45.4		
66-70	74	30.8		
71-75	37	15.4		
≥76	20	8.3		
Sex				
Male	240			
Female	-	-		
Religion				
Islam	240			
Christianity	-			
Others	-			
Marital status				
Married	236	98.3		
Divorced	1	0.4		
Separated	2	0.8		
Widowed	1	0.4		
Family type				
Monogamous	139	57.9		
Polygamous	101	42.1		
Household size			13.04	6.98
≤10	93	38.8		
11-20	117	48.8		
21-30	26	10.8		
31-40	2	0.8		
≥41	2	0.8		
Literacy level				
Non	55	22.9		
Nomadic	42	17.5		
Primary	15	6.3		
Secondary	21	8.8		
Post-secondary	37	15.4		
Quranic	70	29.2		
Years of education			10.92	9.90
≤20	209	85.0		
21-40	32	13.3		
≥41	4	1.7		

Source: Field survey, 2017

The result in Table 1 further disclosed that majority (77.3%) are literates, which is the ability to read and count numbers in one's own language. The possession of education could be the reason why must of the respondents had successors for their farm. This is in agreement with the findings of Fasina and Inegbedion (2014) who posited that, level of education of respondents have significant influence on farm succession plan.

Furthermore, information in Table 1 revealed that majority (85.0%) had less than or equal to 20 years' of education. The mean years of education was 10.92±10.96. This result infers that, most of the aged cattle farmers were literate and can read, write and count numbers. The number of years aged cattle farmers have spent in pursuing knowledge had significantly influence their succession plan.

Table 2 shows that majority (78.3%) of the respondents practiced extensive system of cattle rearing with mean years of experience and mean income per annum was ₦1,000,375.00+ 5,500,000.00. The implication is that aged cattle farmers rear their cattle by moving from one location to another in search of pasture, they have many years of experience and this is expected because they are old however, they had a small number of animals which invariable yield low returns. The extensive management system practiced also explains why aged cattle farmers had to plan for who will take over them because they had to move long distance with their animals in search of food and water, which requires more energy. This result is in tandem with the report of FMARD (2016) that, animal rearing supply chain has been facing serious constraints, ranging from inefficiency to high security threat, as these animals roam from place to place in search of pasture causing a great friction between herders and farmers.

Table 2: Distribution of aged cattle farmers by socioeconomic characteristics

Variables	Frequency	Percentage	Mean	Standard deviation
Type of cattle farming practiced				
Extensive system	188	78.3		
Intensive system	24	10.0		
semi-intensive	28	11.7		
Years of cattle farming experience			30.62	10.56
≤20	53	22.1		
21-40	152	63.3		
41-60	34	14.2		
≥61	1	0.8		
Flock size			112.32	10.56
≤100	152	63.3		
105-200	52	21.7		
205-300	22	9.2		
305-400	9	3.8		
≥405	5	2.1		
Annual income			1,000,375.00	905,422.22
≤500,000	49	20.4		
500,001-1,500,5000	165	68.8		
1,500,5001-2,500,000	15	6.3		
2,500,5001-3,500,5000	3	1.3		
3,500,5001-4,500,5000	2	0.8		
≥4,500,5000	6	2.5		
Age of the farm			28.37	10.61
≤20	71	29.6		
25-40	146	60.8		
45-60	22	9.2		
≥65	1	0.4		

Source: Field survey, 2017

Aged cattle farmers' involvement in cattle farming activities

The results in Table 3 reveals that the respondents were actively involved in 6 out of 14 cattle rearing activities and these activities were rated above the cattle rearing activities involvement grand mean. In ranking, it was observed that aged farmers were involved in the following rearing activities: marketing of animal product ($\bar{x}$ = 1.13); selection of breed ($\bar{x}$=1.07); parasite control ($\bar{x}$=1.07) and identification of sick animals ($\bar{x}$=1.04) among others. This implies that age and drudgery associated with these activities has affected the kind of activities they were involved on the farm.

Table 3: Rank order of aged cattle farmers' involvement in cattle farming activities

Cattle rearing activities	Mean	S.D	Ranking
Marketing of animal products	1.13	1.356	1st
Selection of breed	1.07	1.349	2nd
Parasite control	1.07	1.332	2nd
Identification of sick animals	1.04	1.342	3rd
Give animal water	1.02	1.362	4th
Supplementary feeding	0.96	1.290	5th
Deworming	0.93	1.319	6th
Farm Sanitation	0.91	1.269	7th
Identification	0.87	1.304	8th
Detection of pregnant animal	0.56	1.103	9th
Weaning of calves	0.55	1.111	10th
Milking	0.45	1.033	11th
Creep feeding	0.31	0.807	12th
Castration	0.30	0.893	13th

Source: Field survey, 2017

Overall level of aged cattle farmers' involvement in cattle rearing activities

Result in Table 4 shows that majority (64.6%) of the aged had low involvement in cattle rearing activities. The implication is that the aged cattle farmers in the study area were gradually reducing the amount of work they do, that is from tedious to less tedious. This shows that the aged cattle farmers were ready for succession as most of these activities were done by their successors. Their low involvement in animal rearing activities is as result of age and drudgery associated with these activities.

Table 4: Overall level of aged cattle farmers' involvement in cattle farming activities

Total Involvement Score	Frequency	Percentage	Decision
≤ 14	155	64.6	Low
14.1-28.1	38	15.8	Moderate
28.2-42	47	19.6	High

Source: Field survey, 2017

Succession plan Process of the Aged Cattle farmers

Table 5 reveals that respondents had actively involved their identified successors in almost all the five steps succession plan process. Respondents had involved their identified successors in financial decision on the farm ($\bar{x}$ = 2.91), paying bills ($\bar{x}$= 2.80) make employment decision on the farm ($\bar{x}$ = 2.78), make long term and strategic plans for the farm ($\bar{x}$= 2.76) and successor responsible for technical decision on the farm ($\bar{x}$ = 2.70). It could be observed from the result that the respondents still had much to do as far as technical decision on their farm is concerned.

Table 5: Rank order of the aged cattle rearers succession plan process

Statements	Mean	S.D	Rank
Successors make financial decision on the farm	2.91	2.031	1st
Successor responsible for paying bills	2.80	0.542	2nd
Successor makes employment decision on the farm	2.78	0.595	3rd
Successor makes long term and strategic plans for the farm	2.76	0.583	4th
Successor responsible for technical decision on the farm	2.70	0.73	5th

Grand Mean = 0.79
Source: Field survey, 2017

Overall level of involvement of identified successor into succession process

Table 6 reveals results that majority (90.8%) of the respondents had involved their identified successors into their succession plan process. This implies that after sometime, the successors would take over the farm from the older generation; and which would invariably enhance the livelihood of both farmers.

Table 6: Overall level of involvement of respondent's successor into succession plan process

Total succession score	Frequency	Percentage%	Decision
≤14.66	3	1.3	Low
14.67−29.32	19	7.9	Moderate
29.33−44	218	90.8	High

Mean=13.97, SD=3.218, n= 240
Source: Field Survey, 2017

Principal components of factors influencing aged cattle farmers' succession plan

The contributions of the highly loaded variables to succession plan consisted of 4 factors. These 4 factors are: educational factor, which accounted for 63.342 percent, followed by socioeconomic factor which also accounted for 53.878 percent. The third factor was experience factor which accounted for 43.588 percent and lastly, demographic factor which accounted for 28.558 percent.

Table 7: Result of principal component analysis showing initial Eigen value of factors influencing succession plan of aged cattle farmers

Factors	Eigen value initial total	Percentage variance%	Cumulative%
Demographic	3.141	28.558	28.558
Experience	1.653	15.030	43.588
Socioeconomic	1.132	10.290	53.878
Educational	1.041	9.464	63.342

Source: Computed from result of factor analysis, 2017

Factor1: Demographic factor

Table 8 reveals that three variables were found to significantly contribute to succession plan, out of which one of them was positively loaded. These three variable were age (L=0.751), flock size (L=0.694) and attitude (L=0.619). The demographic factors were named based on criterion 4. This implies that age, flock size and attitude may determine the level of experience which could influence succession plan of the aged cattle rearers.

Factor2: Experience factor

Two variables were found to contribute significantly to experience factor out of which all them were positively loaded. These were age of the farm (L=0933) and years of cattle rearing experience (L=0.929). The factor was named based on criterion4. It implies that age of the farm and years of experience could influence the aged cattle farmers' succession plan in the study area.

Table 8: Factor analysis showing variables contributing to extracted factors influencing succession plan of aged cattle farmers

Factors (variables)	L	L^2	$\sum L^2 = X$
Factor1 (demographic)			
Age	0.751	0.564	1.387
Flock size	0.694	0.440	
Attitude towards succession	0.619	0.383	
Factor2 (experience)			
Years of experience	0.929	0.863	1.733
Age of the farm	0.933	0.870	
Factor3 (socioeconomic)			
Household size	0.565	0.369	0.991
Annual income	0.789	0.662	
Factor4 (educational)			
Years of education	-0.608	0.369	1.187
Years in the community	0.818	0.669	

Source: field survey, 2017
L=loading for factor
L^2= Square of factor loading
X=Latent root for the factor

Factor3: Socioeconomic factor

Two variables were also found to significantly contribute to socioeconomic factors, out of which all of them were positively loaded. These socioeconomic factors were annual income (L=0.789) and household size (L=0.565). The factor was named based on criterion 2. It implies that annual income and household size of the aged cattle rearers could influence their succession plan.

Factor4: Educational factor

Two other variables were found to contribute significantly to educational factor, out of which only one of them was positively loaded. This educational factor was numbers of years spent in the community (L=0.818). The factor was named based on criterion 3. It implies that number of years spent in the community by the aged cattle rearers could greatly influence their succession plan.

Conclusively, the aged cattle rearers with reasonable number of years, experience, flock size, good annual income, and years spent in the community and favourable attitude towards succession would have good succession plan.

Correlation between socioeconomic characteristics of respondents and succession plan

Result in Table 9 shows that at p≤0.05 there were positive and significant relationships between respondents age (r=0.162), years of experience in cattle rearing (r=0.162), flock size (r=0.142) and their succession plan. This implies that as age of the respondents increases, they tend to plan for succession and as their years of experience increase, their flock size also increases, by so doing they tend to see the need for succession planning.

Table 9: Correlation analysis showing the relationship between the respondents' succession plan and some selected socioeconomic characteristics

Socioeconomic variable	r=value	Coefficient of determination	p=value	Decision
Age	0.162*	0.026	0.012	S
Household size	-0.094	0.883	0.147	NS
Years of education	0.023	0.000	0.718	NS
Experience	0.162*	0.026	0.012	S
Flock size	0.140*	0.019	0.030	S
Years spent in the community	-0.016	0.000	0.804	NS
Annual income	-0.070	0.004	0.282	NS
Age of the farm	0.119	0.014	0.066	NS

*Correlation is significant at 0.05 level (2 tailed)
**Correlation is significant at 0.01 level (2 tailed)
Source: Field Survey, 2017

CONCLUSIONS AND RECOMMENDATIONS

The study concludes that there was high consideration for farm succession among aged cattle farmers due to involvement of their identified successors into the succession plan process and the aged cattle farmers had a low involvement in cattle farming activities, it could be due to drudgery associated with such activities and also a result of age. However, factors such as age, flock size, favourable attitude towards succession planning, years of cattle farming experience, age of the farm, annual income, household size, years of education, and number of years spent in the community were the major determinants of farm succession among aged cattle farmers in Kebbi State. Therefore study recommends the following; Going by the age of the farmers (67 years and above) there is a need to encourage new entrance into agricultural profession most especially the youth. There is also the need to invest more into cattle farming because it is more sustainable in terms of employment and income generation. There is should be retirement benefits for aged farmers across the country, this would encourage youth to take up farming as a business

rather than seeing farming as an occupation for older generation.

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GENDER PARTICIPATION IN SOYBEAN PRODUCTION IN OYO STATE, NIGERIA

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ABSTRACT
Participation in soybean production is expected to be high amongst both gender considering the nutrition benefit and economic importance of the crop. This study investigated the gender participation in major activities of soybean production process. Multistage sampling procedure was used to select 111 male and 40 female soybean farmers from 10 Local Government Areas (LGAs) in the state. Data were collected on participation in soybean production, respondents' perception and socioeconomics characteristics with the use of structured questionnaire and data were described and analysed using percentages, means, chi square, and independent sample t-test. Result shows that the average age of the respondents was 50±9.3 years for male and 44±7.8 years for female. Majority (89.4%) were married and 75.5% of the total respondents were farmers cultivating soybean. Mean participation was 19.9±2.6, majority (70.0%) of the female famers had high participation while only 38.7% of the total male respondents showed high participation in soybean production. There was a significant difference (t=2.29, p = 0.02) in the participation of male and female in soybean production, while a non-significant relationship existed between the marital status of female (X^2 = 1.39; p= 0.54) respondents and participation in soybean production. The study concludes that both gender participate in soybean production process at different stages of production. Female were more active in the processing and marketing of the produce. The study recommends that gender needs be identified in providing intervention for soybean production

Keywords: Gender, Soybean production, Participation, Marital status

INTRODUCTION

Soybean (*Glycine max*) is a legume that grows in tropical, subtropical and temperate climates. It has 40 chromosomes and is self-fertile species with less than one percent out crossing. Soybean was introduced to Africa in the 19th century by Chinese traders along the east coast of Africa (Khojely *et al*, 2018). Soybean is an important source of high quality but inexpensive protein and oil. According to Soybean Africa (2016), soybean yields 5 – 10 times more protein than any other crop. The oil produced from soybean is highly digestible and contains no cholesterol. A "by-product" from the oil production (soybean cake) is used as a high protein animal feed in many countries. Soybean has the capacity to ameliorate the nutritional situation, enhance productivity of other crops and also protects the environment from tendencies of agricultural chemicals (FAO, 1998; Shala and Stacey, 2001) in Jaybhay *et al*, 2018)Soybean also improves soil fertility by adding nitrogen from the atmosphere. This is a major benefit in African farming systems, where soils have become exhausted by the need to produce more food for increasing populations and where fertilisers are hardly available and are expensive for farmers. Gender emphasizes the difference in social position of male and female in terms of resource allocation, opportunities and rights (Aguilar, *et al*, 2014). It is a concept used in social science analysis to look at roles, differences between men and women, their experiences as members of a society (Galie *et al*, 2015). According to Olakojo (2017), despite the high number of women in agriculture, the productive capacity remains lower than their male counterpart, which is evident in some rural communities in Nigeria, where women have practically taken over the production and processing of arable crops.

Gender differences in rural farming households vary widely across cultures but certain features are common. Women tend to concentrate their agricultural activities around the homestead primarily because of their domestic and reproductive roles. They play a critical role in food production, post-harvest activities and livestock care (Daudu *et al*, 2015). Certain activities are regarded as "male" or "female"; in some setting a rigid division of labour exists between men and women, household members have separate income and expenditure while in another area, division of labour and specification of tasks is less rigid and not skewed (Solomon, 2007). Galie *et al* (2015) observed that the roles of men and women could be quite different in most societies in soybean production. Agricultural sector in many developing countries is underperforming, in part because women, who represent a crucial resource in agriculture and the rural economy through their roles as farmers, laborers and entrepreneurs, almost everywhere face more severe constraints than men in access to productive resources (Doss, 2018).

Women are considered to be key players in the agricultural sector of most developing countries of the world today as they are seen engaged in a range of productive activities essential to household welfare, agricultural productivity and economic growth (Coker *et a,l* 2017). Millions of women work as farmers and farm workers (Doss, 2018), thereby contributing to national agricultural output and family food security (Brown *et al*., 2001). Empirical studies highlighted on gender and agricultural production in Africa demonstrate that women do not participate equally with men as opportunities provided by increased agricultural

commercialization are usually within the reach of their male counterparts (Fisher and Qaim, 2012). The less involvement of women in farming activities has also been attributed to the fact that they are less likely to command the resources required (such as land, credit, or information) required for effective production (Ogunlela and Muktar, 2009). Ajani (2008) reported that women are marginalized in their access to economic, political, and social resources compared to men, rendering them relatively poorer than their male counterparts. He further identified an unbalanced analysis of women's roles, responsibilities, constraints and opportunities in different activities in relation to those of men. In Nigeria, the involvement of women in agriculture has attracted greater attention in recent years. A key premise of this study is that male farmers have monopolized agricultural activities especially in the area of crop production and management; hence their female counterparts are following several miles behind (Adisa and Adekunle, 2010).

The promotion of soybean is valuable in countries such as Nigeria where other sources of high quality protein are too expensive and the purchasing power of a large percentage of the population is low. Two major importance of soybean are in providing nitrogen to the soil thereby keeping the soil fertile and also supplementing household diet with balanced protein and essential amino acids. The protein content in soybean is valid enough to dare any one concern to participate in its production. Despite these benefits, soybean production faces several constraints at different stages of production (Agada, 2015) which are more influenced by perception of the benefits. It is of importance to note that production of soybean requires the participation of both men and women farmers at various degrees for efficient and sufficient production. This study is premised on the fact that women play very important role in agricultural growth, and that, men and women small holder farmers have different perspective to participating in soybean production (Keane, 2018), and this influences the decision to continue participating. It is therefore necessary to identify areas of participation in soybean production by gender and further determine influence of perception to such level of participation by gender. This will give insight into future allocation of resources in interventions that aim to develop soybean production in Oyo State. Thus, this study was carried out to determine the gender participation in soybean production in Oyo State, Nigeria.

The main objective of this study is to determine the gender participation in soy beans production in the study area. The specific objectives of the study were to:

i. describe the socio economic characteristics of the male and female soybean farmers in the study area,
ii. determine the level of gender participation in soybean production in the study area; and
iii. determine the gender perceptions to soybean production in the study area.

This study validated the following null hypotheses:

- There is no significant relationship between gender perception and participation in soybean production
- There is no significant difference between the male and female farmers in their participation in soybean production

METHODOLOGY

The study was carried out in Oyo State in Southwestern part of Nigeria. Oyo state has been identified as one of the major producers of soybean in Nigeria (AMREC, 2007). The population of the study comprised all the soybean farmers in Oyo state.

Multi-stage sampling technique was used for this study. In the first stage 30% of the Local Government Areas in Oyo state was randomly selected to give 10 out of the 33 local governments they are: Afijio, Lagelu, Ido, Akinyele, Ibarapa East, Kajola, Saki east, Saki West and OgoOluwa Local government Areas. In the second stage, a purposive selection of communities that have more farmers producing soybean was done in each of the Local Government Areas with the help of Agricultural Development Programme information and data set. Using snowball technique, a list of soybean farmers and processors were compiled for both men and women in each communities. Thereafter, 50% of the list generated was randomly selected for both men and women. A total of 111 men and 40 women were sampled in all.

Primary Data with the use of questionnaire was employed to gather information on personal characteristics, level of participation and gender perception to soybean production. Respondents indicated their participation in different stages of soybean production on a three scale of always, rarely and not at all, and scores of 3, 2 and 1 were awarded to each response, respectively. A mean score of 17.9 ± 2.6 was calculated and was used to Categorise the respondents to either high or low participation level.

Data collected were described using means, percentages and standard deviation and were analysed using Chi-Square and t-test.

RESULTS AND DISCUSSIONS

Result in Table 1 shows that 73.5% were male farmers while only 26.5% were female. Respondents mean age was 48 years and majority

were married (89.4%) though more (92.5%) women were in the married category than men. Most (77.5% and 70.0%) of the male and female respondents, respectively were into soybean farming, while only few (23.4%) of male and 27.5% of female processed soybean into other products. This result suggests that soybean cultivation is carried out by both male and female farmers though not in equal distribution as the result shows that more male are into the soybean production process than female. Most of the farmers were in their active years which might mean that soybean production requires some level of strength which could only be supplied by able

men and women. Average annual income for the respondents was ₦323, 000.00 with more female (80.0%) having between ₦201, 000.00 and ₦400, 000.00 and 2.5% of female earned above ₦600, 000.00 per annum. Inferring from this, more women market the soybean produce than men. According to Amusat and Ademola (2013) and Nbanya (2011), soybean has more usefulness to women than the mere cultivating it and selling the produce, the highly nutritious benefit of soybean compel women to convert the produce into different products such as soygari, soymilk, soyakara to improve the diets of their family.

Table 1: Distribution of respondents according to their personal characteristics

Variable	Male	Female	Total
Age (Mean)	49.7 years	44.4 years	48.2 years
<30	0.9	2.5	1.3
31-40	12.6	32.5	17.9
41-50	39.6	40.0	39.7
51-60	38.7	25.0	35.1
>60	8.1	0.0	6.0
Sex			
Male	111	73.5	
Female	40	26.5	
Marital status			
Single	10.8	7.5	9.9
Married	88.3	92.5	89.4
Divorced	0.9	0.0	0.7
Household size			
<4	22.5	35.0	25.8
Between 5 and 8	76.6	62.5	72.8
>8	0.9	2.5	1.3
Educational status			
No formal education	20.8	40.0	32.4
Primary education	14.8	50.0	27.8
Secondary education	30.2	0.0	29.8
Tertiary education	8.7	1.3	10.1
Occupation			
Farming	77.5	70.0	75.5
Processing	23.4	27.5	24.5
Marketing	24.32	30.0	25.8
Annual income ($\bar{x}$= 323000)			
Less or equal ₦200,000.00	26.1	10.0	21.9
201,000 – 400,000	39.6	80.0	50.3
401,000 – 600,000	34.2	7.5	27.2
601,000 – 800,000	0.0	2.5	0.7

Perception to participation in soybean production

Table 2 shows the distribution of respondents according to their perception to participating in soybean production. The result shows that the respondents agreed strongly that soybean is the most profitable crop grown in the communities (94.7%), and it is processed into different products (98.7%) and they found marketing of soybean easier than every other aspect

of the production. In like manner, majority (87.4%) of the respondents disagree that soybean processing is tedious and time consuming (87.4%) and also that it is mostly appreciated when processed. The result suggests that soybean is still well known and popular in Oyo state, and that it is preferred to other crops at all stages of production. This finding is in tandem with the assertions of Ezihe *et al* (2014) that rural farmers are fully aware of the need to cultivate soybean despite all constraints.

The Categorisation of respondents shows that more female (65.0%) had unfavorable perception than male (47.7%). The unfavourable perception expressed by the women could be as a result of constraints they encounter in the process of production which may not be applicable to men. This is consistent with the findings of Nbanya (2011) that rural women cultivating soybean go on working all day but with less profit due to major constraints in the production process.

Table 2: Distribution of respondents according to perception to participating in soybean production

Statements	SA	A	U	D	SD
Soya seeds are usually too expensive and scarce making it difficult to assess	0.0	0.0	78.8	0.7	20.5
The seeds do not grow easily on our lands	3.3	0.0	2.6	94.0	0.0
Soya beans is the most profitable crop grown in the community	94.7	0.0	4.0	0.7	0.7
Soy bean processing is tedious and too time consuming	0.0	0.0	8.6	4.0	87.4
Soy bean is only appreciated in this community when it is processed	0.0	0.0	0.7	0.7	98.7
We process soy bean into different product in this community	98.7	0.7	0.7	0.0	0.0
Marketing of soy beans is easier than other aspect of its production therefore I market	99.3	0.7	0.0	0.0	0.0
We engage more in processing of soy bean than in any of the other production process	0.7	0.7	98.7	0.0	0.0
We don't produce and process soy bean in large quantity in this community	40.4	7.9	0.7	0.0	51.0
It is easier to get the seeds than any other crop seeds that we produce	1.3	0.7	51.0	0.0	48.0
Most women cultivate/plant soy bean in this community	7.9	0.0	51.0	8.6	73.9
Scarcity of hindered the processing of soy beans	55.0	1.3	0.0	7.3	36.4

Score	Male	Female		Total	
35.0 – 41.1	47.7	65.0		52.3	
41.2 – 46.0	52.3	35.0		47.7	

Mean ± SD = 41.2 ± 1.9

Distribution of respondents according to their participation in soybean production

Table 3 shows the distribution of respondents according to their participation in soybean production. The table shows the responses indicating most frequent participation in the different stages of soybean production process. Figures from the table reveals that both gender were always involved in the planting (100%), field weeding (99.1%; 97.5%) harvesting (99.1%; 100%) and storage (99.1%; 100.0%) of soybean for both male and female respectively. Only very few (9.3% and 30.5%) of the total respondents participated in seed breeding and seed marketing respectively. The table further shows that all (100%) the female respondents participated in processing and marketing of the produce, while the same aspect of production engaged 63.1% and 64.4% of male respondents. This finding shows that respondents have overcomed the major constraints in soybean production as identified by Ezihe *et al* (2014) which include constraints during processing and storage. The figures also affirms that women not only play vital roles in food production, they also carry out field agricultural activities (Ezihe *et al*, 2014), performing tasks that were previously exclusive to men (Balogun *et al*, 2015). The table further shows that a little above average (53%) of the total respondents had low participation in soybean production. Nbanya (2011) mentioned constrains associated with stages of soybean production as a major factor that could dissuade farmers from involving in the production process for both male and female. Inferring from this position, low participation recorded among respondents could have been as a result of constraints faced at every level of production.

Table 3 - Distribution of respondents that participated most frequently in soybean production process

S/No	Areas of participation	Male	Female	Total
1)	Seed breeding/sorting	1.8	30.0	9.3
2)	Seed marketing	29.7	32.5	30.5
3)	Land preparation/cultivation	98.2	100.0	98.7
4)	Soybean Planting	100.0	100.0	100.0
5)	Field Weeding	99.1	97.5	98.7
6)	Harvesting	99.1	100.0	99.3
7)	Processing	63.1	100.0	72.8
8)	Storage (produce or product)	99.1	100.0	100.0
9)	Marketing	60.4	100.0	70.9
10)	Packaging	29.7	40.0	32.5

Level of participation	Score	Male	Female	Total
Low	9.0 – 17.8	61.3%	30.0%	53.0%
High	17.9 – 22.0	38.7%	70.0%	47.0%

Mean ± SD – 17.9 ± 2.6

Difference in the perception and in the participation of the respondents along gender

Table 4 shows a significant difference in the participation of respondents along the gender roles. However, there was no difference significant in the perception of male and female to participating in soybean production. The table further shows a higher mean for female level of participation than for male. This suggests that female participates better than male in the soybean production process. In line with this, the high dominance of male in crop production as reported by Fafimisebi *et al*, (2015) and Balogun *et al,* (2014) may not exceed field cultivation and harvesting thus not translating to high participation in the production processes. According to Balogun et al, (2015) and Uzokwe et al (2017), women participation in soybean is beyond the ability to cultivate large acres of soybean farms, it involves passion to ensure food security and to improve the quality of food consumed by the family. And this could be a justifiable reason that spurred their participation above the male counterpart.

Table 4 – Difference in perception and in participation between male and female soybean farmers

	Gender	Mean	Df	t	p
Perception	Male	45.44	109	1.11	0.26
	Female	44.55			
Participation	Male	17.67	74	2.29	0.02*
	Female	18.70			

Significance at 5%

Relationship between perception, educational status, marital status, income level of respondents and level of participation in soybean production

Table 5 shows a significant relationship between the level of perception ($x^2 = 4.72$, p 0.02; x2 =7.16 p = 0.01) educational status (x^2 45.94, p= 0.00; $x^2 = 3.72$, p = 0.00) for both male and female, respectively and level of participation in soybean production. However, marital status ($x^2 = 7.95$ p= 0.01) was only significant to participating in soybean production among male respondents but not significant to female participating in the production. The foregoing affirms that farmer's perception about involvement in soybean production and education exposure determines the commitment to participating.

Table 5 – Relationship between respondents' variables and level of participation in soybean production

Variable	Gender	X^2	df	N	p
Level of Perception	Male	4.92*	1	111	0.02
	Female	7.16*	1	40	0.01
Educational status	Male	45.94*	3	111	0.00
	Female	3.72*	2	40	0.00
Marital Status	Male	7.95*	2	111	0.01
	Female	1.39	1	40	0.54

Significance at 5%

Furthermore, significant relationship that existed between the marital status among male respondents and participation could imply the influence of marital responsibilities on a man as men has been found to cultivate larger hectares of farmland (Coker et al, 2017) than women to satisfy many roles burdened on their shoulder.

Relationship between the age, annual income and participation level among male and female soybean farmers

Table 6 shows a significant relationship (r = -0.281; p<0.05) between male participation in soybean production and income derived from the production. However, income was not significantly related to participation among female soybean farmers (r = 0.281; p>0.05). The table further shows a significant relationship between age and participation of male (r = -0.56; p<0.05) and female (r = -0.332; p<0.05) respondents in soybean production respectively. Several studies (Nbanya, 2011; Ezihe *et al,* 2014) have affirmed the positive relationship that exits between income accruing in

a business and the motivation to continue in that business. Such assertions can only apply to male soybean farmers in this regard because the result shows that income and marital status are not enough motivations for the participating in soybean production. Corroborating this fact, Barau and Oladeji, 2017 found that women are always strongly persuaded about any programe that aims at promoting the welfare of their household. Although, people's motivations for participating may change over time (Kiptot *et al*, 2016), there is every likelihood that women will continue to participate in production since major drivers of motivation such as income derived and marital status are not significant factors that influences their participation. The significance of age to participation in soybean production suggests an age bracket that could effectively produce, process or market soybean. This could be as a result of associated challenges which requires experience or a level of strength.

Table 6 - Correlation analysis between annual income and participation by male and female respondents

	Gender	N	r	P
Income	Male	111	-0.281	0.003*
	Female	40	-0.231	0.152
	Male	111	-0.056	0.00*
	Female	40	0.332	0.03*

Significance at 5%

CONCLUSION AND RECOMMENDATIONS

The study concludes that both gender participate in soybean production at different stages; from seed buying to marketing of the produce/product. Packaging of product was the least area of participation for both genders. Income level and marital status do not significantly relate to female participation in soybean production. The study recommends that

- Agricultural institutions and other relevant organisations should create more awareness to promote male participation in soybean production beyond the field cultivation stage. This is to ensure that male farmers also benefit in the income derived from other stages such as processing, packaging and marketing of soybean.
- Extension agents should train and empower farmers in different soybean product packaging methods to increase the income of farmers.

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HOUSEHOLD FOOD SECURITY CHALLENGES IN LAGOS STATE, NIGERIA

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ABSTRACT

Food insecurity is still a major problem of concern among Nigerian households, hence the need to critically and empirically examine the associated challenges to food security in view of proffering solutions. This study identified households' food security challenges in Lagos State, Nigeria. Household heads were randomly sampled from 135 households in four LGAs in Lagos State, Nigeria. Data were garnered on food security status and challenges using a well-structured questionnaires. Data were analysed using descriptive statistics such as percentages and means. Inferential statistics used were Chi-square and Pearson Product Moment Correlation. Most of the respondents were married (92.6%) and had tertiary education (60.7%). The mean age was 46±18 years, while average monthly income was N97,807.41±14,5017.47. Major information sources on food security were social media ($\bar{x}$=1.65), television ($\bar{x}$=1.62) and family members ($\bar{x}$=1.48). More than half (56.3%) of the households were food secure. Prominent challenges to food security were food availability ($\bar{x}$=1.65), high cost of food ($\bar{x}$=1.47), health status of individuals ($\bar{x}$=1.47) and food accessibility ($\bar{x}$=1.39). Marital status (χ^2= 14.011, p<0.01), household size (r= -0.236, p<0.01) and monthly income (r= 0.235, p<0.01) significantly related with household food security status. The study recommends promotion of information on food security in social media and television. Also, home gardening should be encouraged among respondents so as to aid availability of and accessibility to food items.

Keywords: Food security, Challenges, Households, Information sources, Food accessibility

INTRODUCTION

The importance of food for the survival of mankind cannot be overemphasized. Food, according to Ibok, Idiong, Brown, Okon and Okon (2014) is defined as any substance that human beings eat or drink for sustenance. There is the need for man to be agile and active in its day-to-day activities if productivity is to be ensured. According to FAO (2010), food security is achieved when it is ensured that everyone at all times, have physical, social and economic access to adequate, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life. In the opinion of Wusterfeld (2013), food security exists when all people at all times have physical, social, economic and adequate access to food, which is consumed in sufficient quantity and quality to meet their dietary needs and food preferences, and is supported by an environment of adequate sanitation, health services and care, allowing for a healthy and active life. Attaining food security is a challenge requiring concerted effort of the entire populace in the world. The United Nations Food and Agriculture Organisation - FAO (2015) estimated that about 795 million people of the 7.3 billion people in the world or one out of nine suffered from chronic undernourishment in 2016. It was reported that Sub-Saharan Africa including Nigeria is the region with the highest prevalence of undernourishment in the world at 23.2 percent, or almost one in every four people (FAO, 2017). The opposite of food security is food insecurity. One of the major contributor to various health related problems of human and slow pace of economic development is food insecurity and hunger (Premanandh, 2011). It is noteworthy that food security hinged on food availability, accessibility and affordability. Food availability do not necessarily connotes food accessibility and food affordability. For food to be accessible and affordable, households must have the required financial strength. Notwithstanding, it had been noted that food production in Lagos State can only meets 10-15% of the local demand; hence food crisis is inevitable in Lagos State (Academia, 2020). Owing to the fact that Lagos is one of the State with numerous economic activities contributing to the nation's economy, it becomes imperative to assess food security challenges of the populace so that appropriate measures can be put in place to combat food insecurity. Hence, this study assessed households' food security challenges in Lagos State, Nigeria. Specifically, the study described respondents' socioeconomic characteristics, identify information sources on food security, determine households' food security status and examine the challenges to food security.

METHODOLOGY

Lagos State is located in the southwest Nigeria and was created on May 27, 1967. The State lies approximately on longitude 20 42'E and 32 2'E, and between latitude 60 22'N and 60 2'N (Lagos State Government, 2019). Lagos State is very big and populous for its numerous economic activities. The population for this study consist of household heads in Lagos state. There are 20 Local Government Areas (LGAs) in Lagos State and 20% of the LGAs were randomly sampled to give four LGAs namely; Agege, Lagos mainland, Ikoyi/Obalende and Epe LGAs. Three communities were sampled each from the selected LGAs. In Agege LGA, Ogba, Ajegunle and Mangoro communities were selected; in Lagos Mainland, Otto Abule-nla and Iponri communities were selected; in Ikoyi-Obalende LGA, Obalende, Dolphin and Barracks communities were selected; while in Epe LGA, Abule Alabi, Ayesan and

Obada communities were selected. Ten households were sampled each from the selected communities in Agege, Lagos mainland and Ikoyi/Obalende LGAs, while 15 households were sampled each from the selected communities in Epe LGA. More households were sampled from Epe LGA relative to other LGAs because it is the only rural LGA; others were urban LGAs. A total of 135 households were sampled for this study from Agege (30), Lagos mainland (30) Ikoyi/Obalende (30) and Epe (45) LGAs. Information on food security and its challenges were elicited from the household heads.

Data were collected with the aid of well-structured questionnaires. A list of information sources (10) were presented to respondents on a scale of Always, Sometimes and Never with scores of 2, 1 and 0 assigned, respectively. Weighted mean score for each information source was generated and this was used to rank the information sources in order of importance. Food security status of the respondents was assessed using FANTA scale consisting of 17 statements and this was measured on a 3 point scale of Always, Sometimes and Never with scores of 0, 1 and 2 assigned, respectively. Food security index was computed for each respondents; likewise the mean of the distribution was determined. The mean was used as bench mark for categorising respondents as either food secure for respondents whose food security index was equal to and above the mean or food insecure for respondents with food security index below the mean. Challenges to food security was measured on a 3 point scale of severe challenge, mild challenge and not a challenge with scores of 2, 1 and 0 assigned, respectively. The weighted mean score for each challenge was generated and this was used to rank challenges faced by respondents in order of severity. Data were analysed using descriptive statistics such as percentages and means. Inferential statistics used were Chi-square and Pearson Product Moment Correlation.

RESULTS AND DISCUSSION
Socioeconomic characteristics

Table 1 reveals that the average age of respondents was 45.48±18.42 years, depicting that the respondents were within the working age population. Thus, they are at the advantage of engaging in livelihood activities that will help meet the food demands of their households. Respondents who were male were 50.4%, female were 49.6% and majority were married (92.6%). In attaining food security, it is expected that the married

harnessed their financial resources in meeting their household food demand. Similarly, Roberts, Osadare and Inem (2019) reported mean age of 41.6±9.4 years among households in Shomolu LGA of Lagos state; also majority were married and had formal education. It was found that most households in the study area were of the Christian faith (81.5%). Majority of the respondents (88.8%) were formally educated; 60.7% had tertiary education while 14.8% had secondary education. Very few of the respondents (6.6%) had no formal education. Hence, this result indicates that most of the respondents in the study area were elites who are expected to be abreast of information on food security. It is noteworthy that education could enhance acquisition of knowledge on food security. Primary occupation engaged in by respondents include being civil servant (37.0%), trading (28.1%), farming (18.5%), artisan (10.4%) and sporting (5.9%). This result might be due to the fact that most of the LGAs sampled were urban where farming is not a predominant livelihood activities. Economic activities thrive in urban areas and there are opportunities of getting white collar jobs. It is worthy of note that a good source of income can help households attain food security. Respondents with household size between 4-6 persons (49.6%) were more compared to other household size categories: 1-3 persons (18.5%), 7-9 persons (18.5%) and > 9 persons (13.3%). The average household size of the respondents was 6.05±3.04 persons. Thus, it can be inferred that the household size of the respondents were relatively small. Households with a relatively small household size coupled with good source of income had a chance of achieving food security compared to households with large family size. It was found that 28.1% of the respondents realised more than N80,000 monthly, the amount realised by 24.4% of the respondents was between ₦40,001 and ₦60,000, 23.0% realised between 20,001-40,000. On the average, the amount realised by respondents monthly was ₦97,807.41±145,017.47. Thus, this result implies that households had requisite financial potential to attain food security. It important to note that individuals cannot live beyond their income and according to Bashir *et al.* (2010), individual income influences their food security status. The result on respondents' income is at variance with Roberts, Osadare and Inem (2019) who found that most households in Shomolu LGA of Lagos state realised less than ₦20,000 monthly.

Table 1: Distribution of respondents based on their socioeconomic characteristics (n=135)

Variables	Category	Freq	%	Mean±SD
Age	< 31	33	24.4	
	31 – 40	32	23.7	
	41 – 50	21	15.6	45.48±18.42
	51 – 60	18	13.3	
	> 60	31	23.0	
Sex	Male	68	50.4	
	Female	67	49.6	
Marital status	Married	125	92.6	
	Divorced	2	1.5	
	Separated	3	2.2	
	Widowed	2	1.5	
Religion	Christianity	110	81.5	
	Islam	21	15.6	
	Traditional	4	3.0	
Education	No formal education	9	6.6	
	Primary	18	13.3	
	Secondary	20	14.8	
	Tertiary	82	60.7	
	Vocational	6	4.4	
Primary occupation	Farming	25	18.5	
	Trading	38	28.1	
	Civil servant	50	37.0	
	Artisan	14	10.4	
	Sporting	8	5.9	
Household size	1 – 3	25	18.5	
	4 – 6	67	49.6	6.05±3.04
	7 – 9	25	18.5	
	> 9	18	13.3	
Monthly income (₦)	≤ 20,000	19	14.1	
	20,001 - 40,000	31	23.0	97,807.41±
	40,001 - 60,000	33	24.4	14,5017.47
	60,001 - 80,000	14	10.4	
	> 80,000	38	28.1	

Source: Field Survey, 2017

Sources of information

Table 2 shows that respondents in the study area sourced information mainly from social media ($\bar{x}$=1.65), television ($\bar{x}$=1.62), family members ($\bar{x}$=1.48), colleagues ($\bar{x}$=1.45) and radio ($\bar{x}$=1.30). The use of social media has been a veritable tool for information sharing in recent times.

Table 2: Distribution of respondents based on their sources of information on food security (n=135)

Information sources	Regularly	Occasionally	Never	Mean	Rank
Radio	42.2	45.9	11.9	1.30	5th
Television	65.9	30.4	3.7	1.62	2nd
Magazine	16.3	60.0	23.7	0.93	7th
Extension workers	25.2	38.5	36.3	0.89	8th
Health practitioners	5.2	39.3	55.6	0.50	10th
Family members	50.4	47.4	2.2	1.48	3rd
Colleagues	50.4	44.4	5.2	1.45	4th
Newspaper	34.1	60.0	5.9	1.28	6th
Social media	71.1	23.0	5.9	1.65	1st
Seminar	5.2	75.6	19.3	0.86	9th

Source: Field Survey, 2017

It is not surprising it ranked first as major source of information on food security among the respondents. As earlier reported, majority of the respondents were elites who had tertiary education, hence the prominence of social media and television as sources of information on food security. As rightly noted by Billedo, Amsterdam, Kerkhof and Finkenauer (2015), the utilisation of social networking sites is motivated by the need to communicate and build relationships that are socially based and useful for everyday life. It was noted that the family is still a potent source of information on a wide range of issues, food inclusive.

Household food security of respondents

Table 3 reveals that majority of the respondents had never been in a situation whereby children lose weight because there was not enough food to eat (80.0%), did not eat for a whole day because there was not enough money for food (80.7%) and never skipped meals because there was not enough money for food (73.3%) in the past 30 days. Least prominent as items in the scale that determined respondents' food security status were eating food not preferred because of lack of resources to obtain other types of food and having few kinds of food to eat day after day due to lack of resources in the past 30 days. Findings from this study implies that most of the respondents were food secure.

Table 3: Distribution of respondents based on their food security (n=135)

Items	Often	Sometimes	Never
In the past 30 days, did you worry that your household would not have enough food?	13.3	36.3	50.4
In the past 30 days, were you or any household member not able to eat The kind of foods you preferred because of poor income?	5.9	45.2	48.9
In the past 30 days, were you or any household member eat just a few kinds of food day after day due to lack of resources?	10.4	41.5	48.1
In the past 30 days, did you or any household member eat food that you preferred not to eat because of lack of resources to obtain other types of food?	4.4	54.1	41.5
In the past 30 days, did you or any household member eat smaller meal than you felt needed because there was not enough food?	5.9	45.9	48.1
In the past 30 days, did you or any household member eat fewer meals in a day because there was not enough food?	9.6	37.0	53.3
In the past 30 days, was there ever no food to eat at all in your household because there were no resources to get more?	4.4	23.7	71.9
In the past 30 days, did you or any household member go to sleep at night hungry because there was not enough food?	4.4	20.0	75.6
In the past 30 days, did you or any household members go a whole day without eating anything because there was not enough food	5.9	18.5	75.6
In the past 30 days you relied on only a few kinds of low-cost food to feed children because there was no enough money to buy food.	3.7	34.1	62.2
In the past 30 days you could not feed children on balanced meal because you could not afford it.	3.0	31.1	65.9
In the past 30 days children did not eat enough food because you could not afford it.	3.7	28.9	67.4
In the past 30 days you cut size of children meal because there wasn't enough money for food.	3.0	37.8	59.3
In the past 30 days children were hungry for more food but you could not afford it.	2.2	29.6	68.1
In the past 30 days children skipped meals because there was not enough money for food	2.2	24.4	73.3
In the past 30 days children did not eat for a whole day because there wasn't enough money for food.	6.7	12.6	80.7
In the past 30 days children lose weight because there was not enough food to eat.	3.7	16.3	80.0

It is noteworthy that measures are being taken by Lagos State Government to combat food insecurity. In order to avoid food crisis in Lagos State, the State Government has evolved programmes to boost food security which include marine agriculture, fisheries development, artisanal fisheries, development/replenishment of open water bodies, provision of wholesome meat, and establishment of modern abattoirs, integrated livestock expansion, acquisition of expansive

arable lands in other states for farming, agricultural input supply to farmers and fishermen and credit delivery to farmers, redevelopment of agricultural cooperatives, provision of agricultural land services, root and tuber expansion and partnership with other states to enhance food security (Lagos State Government, 2017).

Categorisation of households by their food security status

The food security status of the respondents is presented in Table 4. It was found that majority of the respondents were food secure (56.3%), while 43.7% were food insecure. Food security of the respondents in the study area might be attributed to the increased awareness on food security as major source of information identified in this study was the use of social media and perhaps participation of respondents in entrepreneurial activities that aid their food security. Smith, Greene and Silbernagel (2013) noted that in recent years, urban agriculture has become an increasingly relevant topic in the science and planning of urban food systems aimed at reducing food insecurity at the level of the household. It is noteworthy that Lagos State is one of the monumental city in Nigeria where there is an active and profitable numerous economic activities that can help boost household income, hence the food security status observed among respondents. It is also noteworthy that Lagos State government is making assiduous effort to address food insecurity in the state. As an example, the Nigeria Agricultural Sector Food Security and Nutrition Strategy 2016-2025 (AFSNS) has been developed to guide the activities of the Federal Ministry of Agriculture and Rural Development and the wider agricultural sector in Nigeria for improved nutrition with Lagos State being one of the four focal States that have been selected for implementation of the strategy (Lagos State Government, 2019).

Table 4: Categorisation of households based on their food security status (n=135)

Variable	Freq.	%	Min	Max	Mean	Std Dev
Food insecure (< mean)	59	43.7	13.00	34.00	26.78	5.89
Food secure (≥ mean)	76	56.3				
Total	135	100.0				

Challenges to food security in the study area

Table 5 reveals that in the study area, food availability ($\bar{x}$=1.65) ranked fist as the most prominent challenge to attainment of food security with 74.5% indicating it as a severe challenge. Availability of food would influence respondents' food security as most food choices are made depending on the food that are at the disposal of the individual making the choice of what to eat. Hence, it is noteworthy that the choice of what food to eat depends on the available resources. This result agrees with Reicks *et al* (2015) that availability of food is a factor that influences what and how much one eats. Food availability as the most prominent food security challenge was followed by health status ($\bar{x}$=1.47) and high cost of food ($\bar{x}$=1.47) which both tiled as the 2nd major challenge to food security. Majority of the respondents indicated health status (64.7%) and high cost of food (64.7%) as a severe challenge in the study area. It noteworthy that the status of an individual's health will inform the kind of food he/she would take in a bid to boost the individual's immunity, improve the state of health and ensure recovery from a particular illness. Findings from this study aligns with Anugwa and Agwu (2019) who reported perceived causes of food insecurity to include high food price. Also, Hadley *et al*. (2012) noted that rising food prices exacerbates the problem of food insecurity.

Table 5: Percentage distribution of the respondents based on their challenges to food security (n=135)

Items	Not a challenge	Mild challenge	Severe challenge	Mean	Rank
Food availability	9.8	15.7	74.5	1.65	1st
Health status	17.6	17.6	64.7	1.47	2nd
High cost of food	17.6	17.6	64.7	1.47	2nd
Preparatory time	19.6	21.6	58.8	1.39	4th
Accessibility to food items	17.6	25.5	56.9	1.39	4th
Seasonality of food items	21.6	19.6	58.8	1.37	6th
Lack of storage facilities	27.5	19.6	52.9	1.25	7th
Insufficient income	27.5	19.6	52.9	1.25	7th
Unpredictable climate	21.6	41.2	37.3	1.16	9th
Culture	27.5	29.4	43.1	1.16	9th
Locality	27.5	35.3	37.3	1.10	11th
Religion	33.3	27.5	39.2	1.06	12th
Illiteracy	47.1	11.8	41.2	0.94	13th

Source: Field survey, 2017

Relationship between selected independent variables (socioeconomic characteristics, sources of information, knowledge, challenges) and food security

Chi square and Pearson's Product of Moment Correlation (PPMC) results between selected independent variables and respondents' food security status are shown in Table 6. The negative correlation between the age of the respondents and food security status was not significant (r=- 0.117, p>0.05). However, there was a significant relationship between marital status and food security status (χ^2= 14.011, p< 0.01). This result is an indication of the fact that being married can help ensure household food security, particularly when couple are gainfully employed. There was an inverse and significant relationship between household size and food security (r=0.236, p< 0.01). This result implies that respondents with fewer number of people in their households were more food secure compared to respondents with large household size. The correlation coefficient of 0.235 obtained for respondents' monthly income was significant at 1% implying that household income influence their food security status. Similarly, Roberts, Osadare and Inem (2019) established that households with higher monthly incomes had higher levels of food security level among sampled respondents in Shomolu LGA of Lagos state. There was no significant relationship between respondents' sources of information (r= 0.093, p>0.05), knowledge (r= 0.110, p>0.05) and their food security. This implies that increase in access to information on food security and being knowledgeable on the kinds of food to eat do not necessarily translate to being food secure. This indicates that other factors might hampered food security efforts of the respondents. Food security status of the respondents was not significant with challenges to food security (r= -0.100, p>0.05).

Table 6: Relationship between selected independent variables (socioeconomic characteristics, sources of information, knowledge, challenges) and food security

Variables	χ^2 value	df	r value	p value	decision
Age			-0.117	0.178	Not significant
Marital status	14.011[**]	4		0.007	Significant
Educational level	8.044	5		0.154	Not significant
Primary occupation	8.063	4		0.089	Not significant
Household size			-0.236[**]	0.006	Significant
Monthly income			0.235[**]	0.006	Significant
Sources of information			0.093	0.284	Not significant
Knowledge			0.110	0.205	Not significant
Food security challenges			-0.100	0.248	Not significant

CONCLUSION AND RECOMMENDATIONS

Respondents were in their productive years and were formally educated with majority having tertiary education. Social media and television were the most utilised information sources on food security. Information on food security through newspapers, magazines and through seminars was sparing in the study area. Prominent challenges to food security were food availability, respondents' health status, high cost of food and food accessibility. Food security status of respondents was influenced by marital status, household size and monthly income. The study recommends promotion of information on food security in social media and television as they were prominently used by respondents in the study area. Also, home gardening should be encouraged among respondents by the state government and non governmental organisations so as to aid availability of and accessibility to food items; this will also help reduce amount of money spend on food by respondents.

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UTILISATION OF POSTHARVEST MANAGEMENT PRACTICES AMONG SWEET ORANGE FARMERS IN OSUN STATE, NIGERIA

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ABSTRACT

Postharvest management practices utilisation is crucial if losses of fruits were to be curtailed by farmers. This study examined utilisation of postharvest management practices among sweet orange farmers in Osun State, Nigeria. A total 61 sweet orange farmers that harvest and sell their oranges were sampled. Structured interview schedule was used for data collection. Data analysis was done using descriptive (percentages and means) and inferential (Chi square and Pearson Product Moment Correlation) statistics. Most of the respondents were male (73.8%), married (91.8%) and had formal education (63.9%). The mean age was 52.0±10.0 years, while the mean household size was 7.0±2.0 persons. Major sources of information on postharvest management were associations (1.80±0.401), marketers (1.66±0.476) and farmers (1.15±0.628). The knowledge of postharvest management practices was high for 72.1% of the farmers. Utilisation of harvesting management practices ($\bar{x}$=10.10) ranked 1st, while marketing management practices ($\bar{x}$=8.85) ranked 2nd. The level of postharvest management practices' utilisation was high among 49.2% of the respondents. Age was inversely significant with utilisation of postharvest management practices (r=-0.278, p<0.05). However, there was no significant relationship between knowledge and utilisation of postharvest management practices (r=0.116, p>0.05). The study recommend the need to encourage farmers to intensify use of postharvest management practices in order to maximise profit.

Keywords: Utilisation, Postharvest, Management practices, Sweet orange

INTRODUCTION

Different crops - both tree and arable crops are cultivated by farmers in Nigeria. In southwest Nigeria, one of tree crop cultivated by farmers is sweet orange. Sweet oranges (*Citrus sinensis* L. Osbeck) belonged to the citrus family and the most important of the citrus fruits widely consumed include sweet oranges, tangerines, lemons, limes and grapefruits. According to Okafor (2016), sweet oranges are highly produced in Osun State. Likewise, Adetuyi, Ibrahim, Ajalia and Oloye (2010) noted that sweet oranges are produced in the southwestern states of Nigeria and are transported to places of high demand and where it commands good prices. The fact that sweet orange is the main and high value fruit tree crop in the world cannot be overemphasised. They are widely grown in all suitable subtropical and tropical climates and are consumed worldwide. Sweet oranges can be eaten fresh, juiced, and in processed products. Sometimes they are used for ornamental purposes. It is important to note that sweet oranges are liable to damage and deterioration during harvesting, transportation, marketing and storage, if not properly managed. Postharvest management of crops is of great importance to food availability and increase in farmers' income. This is because the level of profit is dependent on good postharvest management practices of farmers' crops (Ladapo and Oladele, 2011). Postharvest management practices are practices engaged in by farmers at each stage of postharvest handling of sweet orange. The stages considered in this study include harvesting, sorting, packaging, transportation and marketing management practices. Postharvest management practices are important to reduce postharvest losses and improve overall harvest quality. Proper postharvest management of sweet oranges will ensure produce get to consumer in good quality and this will enable consumers derive satisfaction from produce bought. It is noteworthy that proper harvesting techniques are very important if losses are to be minimised. Appropriate management practices can assist in the reduction of postharvest losses of sweet orange. Moreso, Olayemi, Adegbola, Bamishaiye and Awagu (2012) found that factors contributing to postharvest losses of fruits and vegetables in Nigeria include poor management practices. Hence, this study examined the extent of postharvest management utilisation among sweet orange farmers in Osun State, Nigeria and the specific objectives guiding the study are:

1. to describe the personal characteristics of the respondents.
2. to determine respondents' sources of information on postharvest management practices.
3. to examine the respondents' knowledge of postharvest management practices.
4. to determine the respondents' utilisation of postharvest management practices.

The hypotheses of the study are as stated;

H_01: There is no significant relationship between personal characteristics of the respondents and their utilisation of postharvest management practices.

H_02: There is no significant relationship between respondents' knowledge and their utilisation of postharvest management practices.

METHODOLOGY

Osun is an inland State in Southwestern Nigeria with its capital situated at Osogbo. Its geographic coordinates are longitude 4° 30' and 4°

5' East. Latitude 7° 30' and 7° 5' North. Osun State occupies a landmass of 9,251 km². Ife East, Ife Central and Ayedaade Local Government Areas (LGAs) were purposively selected being major orange producing LGAs in the state. Orange producing communities were purposively sampled; Yekemi and Ode-aye were sampled in Ife East LGA, Abagboro and Fashina were sampled in Ife Central LGA, while Gbongan was sampled in Ayedaade LGA. Owing to the fact that most orange farmers in Osun sell their oranges while still on the tree, a snowball technique was used to generate a list of orange farmers (61) that harvest and sell their oranges at the market with the assistance of ADP extension agents and all the orange farmers were used for the study owing to the small population size. In Ife East LGA, 12 and 6 orange farmers were sampled from Yekemi and Ode-aye, respectively; in Ife Central, 8 and 10 orange farmers were sampled from Abagboro and Fashina, respectively; while 25 orange farmers were sampled from Gbongan in Ayedaade LGA.

Data was collected with the aid of interview schedule. Eleven information sources were presented to respondents on a 3 point scale of always, sometimes and never with scores of 2, 1 and 0 assigned, respectively. Weighted mean score for each information source was computed and this was used to rank the information sources in order of use. Knowledge items (19) was measured on a 2 point scale of true and false with score of 1 and 0 assigned, respectively. The mean of knowledge scores was computed and used to categorise respondents as either having high (> mean) or low (≤ mean) level of knowledge. Utilisation of postharvest management practices for sweet orange were obtained by presenting farmers with a list of 36 items on management practices utilisation. These management practices were sorted out from literatures and gathered during reconnaissance survey to the study area. Postharvest management practices utilisation were categorised into harvesting, packaging, transportation, sorting and marketing management practices. The frequency of use of postharvest management practices was measured using a 3 point scale of always, sometimes and never with scores of 2, 1 and 0 assigned respectively. Respondents' scores on management practices utilisation were added up while the mean score was computed and used to categorise farmers as either utilising high or low level of management practices.

Data was analysed with the use of descriptive statistics such as frequencies and means, while inferential statistical tool used for hypotheses testing was Pearson's Product Moment Correlation.

RESULT AND DISCUSSION
Personal characteristics of respondents

The distribution of the respondents based on their personal characteristics is presented in Table 1. It was discovered that higher proportion of the respondents (68.8%) were within the age category of 41-60 years. This is in tandem with Muyengi et al. (2014) who found that 58.0% of farmers who grow oranges are within 41 and 60 years of age. In this study, farmers who were more than 60 years of age were 18.0%, while 13.2% were between 31-40 years of age. The mean age of farmers was 52.1±9.5 years implying a productive farming population with respect to sweet orange production. There were more male (73.8%) involved in orange production than female (26.2%) in the study area. The result is consistent with findings by Raufu (2010) that most farmers in Osun were male. Majority of the farmers were married (91.8%), while very few were widow (8.2%). This result is a reflection of the premium placed on marriage institution in the study area. The result of farmers' marital status obtained in Osun agrees with Raufu (2010) who found that most farmers in Osun were married. It was found that 63.9% of the respondents had formal education, while those who had no any form of education were 16.4%. It can be inferred from the result of this study that farmers in the study area have low educational qualification (Table 1). It is noteworthy that education enhances knowledge and access to information, but individual with low educational qualification tends to be disadvantaged as they will not be abreast of information on improved management practices if there were any. The result of this study is in consonance with a similar study in Zimbabwe, where most farmers were found to have secondary and primary education (Musasa et al, 2015). The household size of most of the farmers was between 6 and 10 persons. Average household size was 7.0±2.0 persons indicating a fairly large household size of respondents in the study area.

Sources of information on postharvest management practices

The distribution of farmers based on their sources of information on postharvest management practices is presented in Table 2. Result shows that few farmers occasionally got information on postharvest management from radio (27.9%), while very few farmers occasionally got information from television (4.9%).

Table 1: Distribution of farmers based on their personal characteristics

Variables	Categories	Freq	%
Age (in years)	31 – 40	8	13.2
	41 – 50	21	34.4
	51 – 60	21	34.4
	> 60	11	18.0
	Mean±SD	52±10	
Sex	Male	45	73.8
	Female	16	26.2
Marital status	Married	56	91.8
	Widowed	5	8.2
Religion	Christianity	32	52.5
	Islam	29	47.5
Education	Non formal education	12	19.7
	No formal education	10	16.4
	Primary education	22	36.1
	Secondary education	16	26.2
	Tertiary education	1	1.6
Household size (persons)	1 – 5	10	16.4
	6 – 10	48	78.7
	11 – 15	3	4.9
	Mean±SD	7±2	

It was found that 27.9% of the farmers always got information on postharvest management from their fellow farmers, while it was on occasional basis among 59.0% of the farmers. This might be because majority of the farmers sell their oranges while still on the tree and in such a situation do not incur any loss that might warrant sourcing for information. It was discovered during the field survey that very few farmers harvest and sell their oranges; this account for the small sample size used for this study. Sourcing of information through associations was pronounced among farmers as majority always (80.3%) got information on postharvest management through associations. Thus, major sources of information on postharvest management were associations ($\bar{X}$=1.80), marketers ($\bar{X}$=1.66) and farmers ($\bar{X}$=1.15) which ranked 1st, 2nd and 3rd, respectively. All (100.0%) the respondents never got information on postharvest management from research institutes and extension agents. The gap in information confirms the assertion by Oni (2013) that research institutes outputs such as improved storage techniques invented were not disseminated to farmers, hence they remained unadopted.

Table 2: Distribution of farmers based on their sources of information on postharvest management practices

S/N	Information sources	A	S	N	$\bar{X}$±SD	R
1	Associations	80.3	19.7	0.0	1.80±0.401	1st
2	Marketers	65.6	34.4	0.0	1.66±0.476	2nd
3	Farmers	27.9	59.0	13.1	1.15±0.628	3rd
4	Transporters	6.6	39.3	54.1	0.52±0.622	4th
5	ADP	13.1	18.0	68.9	0.44±0.719	5th
6	Radio	0.0	27.9	72.1	0.28±0.452	6th
7	Extension services	0.0	26.2	73.8	0.26±0.444	7th
8	Ministry of Agric.	0.0	14.8	85.2	0.15±0.358	8th
9	Television	0.0	4.9	95.1	0.05±0.218	9th
10	Research Institute	0.0	0.0	100.0	0.00±0.00	
11	NGO	0.0	0.0	100.0	0.00±0.00	

A = Always, S = Sometimes, N = Never, R = Rank

Knowledge of farmers on postharvest management practices

The study reveals in Table 3 that all farmers indicated that breakdown of vehicles while moving oranges to the market increases orange deterioration (100.0%) and that sorting of diseased fruits helps prevent contamination of healthy fruits (100.0%). Hence, it is imperative for vehicles to be in good working condition if loses are to be curtailed. It is noteworthy that the rate of deterioration is increased when healthy fruits are packed with diseased fruits. Respondents were knowledgeable that orange should be prevented from getting bruised while harvesting and

transporting and that damaged fruits should not be packed with good ones. Damaged or bruised fruits provide entry points for micro-organisms activities, thereby leading to increase in losses incurred by farmers. All the respondents (100.0%) indicated that oranges lose value due to weight loss or wilting and that oranges have low market value due to poor appearance, decay or damage during handling. Hence, it is pertinent for farmers to ensure that sweet oranges are carefully handled and in good condition for consumption if profit are to be maximise. Farmers (100.0%) were knowledgeable that produce loose value due to exposure to high temperature if it cannot be sold

right away. This agrees with Atanda *et al*. (2011) who stated that increase in temperature reduces the shelf life of horticultural crops as most factors that make the produce to deteriorate or reduce its quality usually occur at a rate that is faster as the temperature increases. The use of poor roads for orange transportation leads to postharvest loss as noted by 75.4% of the farmers. During the field survey, it was found that farmers believed that once orange is in good condition, the state of road does not really matter. From the foregoing, it can be inferred from the outcome of this study that respondents had good knowledge of postharvest management practices.

Table 3: Distribution of farmers based on their knowledge of postharvest management practices

S/N	Knowledge statements	True F	%
1	Breakdown of vehicles while moving orange to the market increases citrus deterioration	61	100.0
2	After harvest, orange should be protected from the sun	57	93.4
3	Sorting of diseased oranges helps prevent contamination of healthy fruits	61	100.0
4	Oranges, while harvesting and transporting should be prevented from getting bruised	61	100.0
5	High cost of transportation contribute to postharvest loss	42	68.9
6	Damaged oranges should not be packed with good ones	61	100.0
7	Poor ventilation during storage encourages deterioration	61	100.0
8	Packing mature and immature oranges together is a bad idea	61	100.0
9	Poor loading do not contribute to postharvest loss	30	49.2
10	Use of poor roads lead to postharvest loss	46	75.4
11	Packaging oranges properly prevent mechanical damage	0	0.0
12	Poor field sanitation promotes spread of bacterial diseases	61	100.0
13	Oranges lose value due to weight loss or wilting	61	100.0
14	Oranges have low market value due to poor appearance, decay or damage during handling	61	100.0
15	Produce loose value due to exposure to high temperature if it cannot be sold right away	61	100.0
16	Use of shade is important for orange	61	100.0
17	Injuries to orange increase water loss in orange	61	100.0
18	Orange becomes overripe or softens when exposed to heat	61	100.0
19	During harvesting, orange should be avoided from falling directly on the ground	61	100.0

Level of knowledge of postharvest management practices

The result in Table 4 reveals that majority of the farmers (72.1%) were within the high level of knowledge category, while 27.9% had low level of knowledge. This implies that despite the low

educational qualification of respondents, the level of knowledge was high. This result disagrees with Muhammad *et al* (2012) who found that farmers had poor knowledge of proper postharvest management practices, hence the huge losses incurred at harvest.

Table 4: Distribution of farmers based on their level of knowledge

Knowledge	Freq.	%	Min, score	Max. score	Mean	S Dev.
Low (< mean)	17	27.9	17.00	20.00	18.00	0.96
High (≥ mean)	44	72.1				

Utilisation of postharvest management practices of sweet orange farmers

Harvesting management practices

Table 5 reveals that majority (93.4%) of the farmers do not shake trees while harvesting and harvesting only during the cool hour of the day was not a usual practice (75.4%). This result shows that the harvesting of oranges is not restricted to a particular time of the day. All farmers always ensure that containers used for packing oranges were always clean, smooth and free of rough edges. Thus, this will help reduce incidence of mechanical damage to orange on the farm. According to El-Ramady *et al.* (2015), poor appearance of fruits result from mechanical damages such as bruises which also serves as entry points for microbes, insects and pests.

Packaging management practices

The practice of washing fruits is not engaged in by all farmers (100.0%) but oranges were always sorted (100.0%) before they are packaged. The use of packaging materials (mainly sacks) by farmers is on occasional basis (100.0%). It was discovered during the course of this survey that packaging materials were used by most farmers during the off season when production is minimal. The packaging material which was found to be sack bags are easier for carrying oranges on motorcycles to nearby markets. Likewise in South Wollo of Ethiopia, sacks were being used by most of the farmers where large quantity of oranges were tightly packed, thereby leading to poor ventilation between them (Seid, Hassen and Yitbarek, 2013).

Transportation management practices

Over loading of vehicles seems to be inevitable as 86.9% of farmers occasionally ensure vehicles were not overloaded. However, the stability of loaded vehicles is always ensured by all farmers. When vehicles are being loaded with oranges, they are not usually kept under shade by most farmers (98.4%) to minimise heat, but after vehicles are loaded, almost all the farmers (96.7%) ensure that transport is done during the coolest part of the day. During the course of this survey it was discovered that most times oranges are transported early in the morning, towards evening or overnight in order to avoid the heat of the sun.

Sorting management practices

During sorting, the removal of bruised and diseased orange on the farm and in the market was always carried out by all farmers. Sorting according to stage of ripeness and size was not usually done on the farm and before packaging or loading by all farmers. However in the market, oranges were sorted according to bruises/diseased (100.0%), stage of ripeness (100.0%) and size (100.0%). This result shows the meticulous nature of the buyers during sorting; ensuring only good quality oranges were bought. It is noteworthy that oranges bought by farmers might stay for some days before they are eventually sold, hence the need to buy good ones in order to maximise profit.

Marketing management practices

None of the farmers sell at the farm gate and 73.8% never patronise neighbouring markets. During the course of this survey, it was found that sampled farmers sell their produce in urban markets (majorly markets in Lagos State) during the peak season. All farmers (100.0%) sell their produce even if price is not satisfactory. Since most farmers patronise Lagos markets, it will be wise to sell even if prices were not favourable than to lose the entire oranges since they are perishable in nature. This will also help minimise loss while enhancing loss reduction. Almost (96.7%) all the farmers never sell harvested oranges the same day, while most farmers (96.7%) sometimes had to leave their oranges for days before sale. This result might be because orange had to be harvested for days in order to get the required quantity that will fill up vehicles. Insufficiency of workers also prolongs the number of days oranges are harvested.

Furthermore, Table 5 reveals that harvesting management practices ranked 1st among farmers with a mean of 10.10 and this was followed by marketing ($\bar{X}$=8.85) and packaging. ($\bar{X}$=6.96) that ranked 2nd and 3rd respectively.

Level of postharvest management practices utilisation

Farmers were categorised into having either high or low level of management practices utilisation based on the mean score. The result as presented in Table 5.5 reveals that the management practices by most farmers (50.8%) was high, while 49.2% of the farmers' utilisation of management practices was low. It can be inferred from the result of this study that the use of management practices by farmers was at the moderate level.

Table 5: Distribution of farmers based on their postharvest management practices

S/N	Management practices	A	S	N	$\bar{X}$
		Frequency of use			
A	**Harvesting (n=61)**				**10.10 (1st)**
1	Ensure trees are not shaken when harvesting	93.4	6.6	0.0	1.93
2	Harvest only during the cool hour of the day	0.0	75.4	24.6	0.75
3	Harvest only mature citrus	100.0	0.0	0.0	2.00
4	Ensure containers used by field pickers are clean	100.0	0.0	0.0	2.00
5	Ensure containers used by field pickers are smooth and free of rough edges	100.0	0.0	0.0	2.00
6	Keep fruits in the shade after harvesting	39.3	60.7	0.0	1.39
7	Provide gentle handling to avoid cuts and bruising damage	95.1	4.9	0.0	1.95
B	**Packaging (n=27)**				**6.96 (3rd)**
8	Wash citrus before packaging	0.0	0.0	100.0	0.00
9	Sort citrus before packaging	100.0	0.0	0.0	2.00
10	Use packaging materials for citrus before loading	0.0	100.0	0.0	0.96
11	Package fruits immediately after harvesting	0.0	0.0	100.0	0.00
12	Ensure packaging materials are clean to prevent contamination	100.0	0.0	0.0	2.00
13	Package only good quality fruit	100.0	0.0	0.0	2.00
C	**Transportation (n=61)**				**6.70 (4th)**
14	Avoid overloading of vehicle	11.5	86.9	1.6	1.10
15	Ensure load is stable	100.0			2.00
16	Keep loaded vehicles in the shade to minimise heat		1.6	98.4	0.02
17	Transport during the coolest part of the day	96.7	3.3	0.0	1.97
18	Avoid throwing of produce from vehicle when loading and offloading	49.2	50.8	0.0	1.49
D	**Sorting on the farm (n=61)**				**5.69 (5th)**
19	By bruises and diseases	100.0	0.0	0.0	2.00
20	By stage of ripeness	0.0	0.0	100.0	0.00
21	By sizes	0.0	0.0	100.0	0.00
	Sorting before packaging/loading into vehicle (n=61)				
22	By bruises and diseases	100.0	0.0	0.0	2.00
23	By stage of ripeness	0.0	0.0	100.0	0.00
24	By sizes	0.0	0.0	100.0	0.00
	Sorting in the market before selling to buyers (n=61)				
25	By bruises and diseases	100.0	0.0	0.0	2.00
26	By stage of ripeness	100.0	0.0	0.0	2.00
27	By sizes	100.0	0.0	0.0	2.00
E	**Marketing (n=61)**				**8.85 (2nd)**
28	Sell citrus at a neighbouring market	0.0	26.2	73.8	0.26
29	Sell citrus at the farm gate	0.0	0.0	100.0	0.00
30	Refuse to sell if price is not favourable	0.0	0.0	100.0	2.00
31	Sorting of diseased fruits before marketing	98.4	0.0	1.6	1.97
32	Selling oranges the same day it was harvested	0.0	3.3	96.7	0.03
33	Leaving oranges for days before selling after harvesting	0.0	96.7	3.3	0.97
34	Keep collection center clean always	0.0	36.1	63.9	1.36
35	Protect fruits against sun	14.8	83.6	1.6	1.13
36	Protect fruits against rain	14.8	83.6	1.6	1.13

A = Always, S = Sometimes, N = Never

Table 6: Level of use of management practices

Level of use	Freq	%	Min	Max	Mean	SD
Low (< mean)	31	50.8	33.00	44.00	37.75	2.09
High (≥ mean)	30	49.2				

Relationship between selected personal characteristics and postharvest management practices utilisation

Chi square and Pearson's Product Moment Correlation (PPMC) results between personal characteristics and postharvest management practices utilisation were presented in Table 7. The relationship between farmers' age and the use of postharvest management practices ($r=-0.278$, $p<0.01$) was significant. The inverse correlation coefficient observed indicates that the older a farmer was, the lesser the utilisation of postharvest management practices. It can be inferred that farmers who were younger in age tends to utilise postharvest management practices more. However, there was no significant relationship between sex, marital status, religion, education, household size and the use of postharvest management practices. This implies that the aforementioned personal characteristics do not significantly influence utilisation of postharvest management practices.

Table 7: Relationship between personal characteristics and postharvest management utilisation

Variables	χ^2	df	r-value	p-value
Age (in years)			-0.278[*]	0.030
Sex	3.323	1		0.068
Marital status	2.070	1		0.150
Religion	0.794	1		0.373
Education	1.416	4		0.341
Household size (persons)			-0.224	0.083

Relationship between knowledge and postharvest management practices utilisation

Table 8 presents the result of the correlation analysis between orange farmers' knowledge and postharvest management practices utilisation. It was found that a significant relationship do not exist between farmers' knowledge and the use of postharvest management practices ($r=0.116$, $p>0.05$), Thus, it can be inferred that knowledge do not necessarily translate to increase in use of postharvest management practices.

Table 8: Relationship between knowledge and postharvest management utilisation

Variables	N	r-value	p-value
Knowledge and management practices utilisation	61	0.116	0.375

CONCLUSION AND RECOMMENDATIONS

The study established a productive farming population in sweet orange production in the study area. But the proportion of elderly farmers were more compared to youths. Though farmers have knowledge of postharvest management practices but this does not necessarily translate to increase in the use of management practices. This might be attributed to array of challenges faced by farmers during postharvest handling. Farmers who are younger in age utilised postharvest management practices more compared to elderly ones based on the result of hypothesis testing on age. The study recommends the need to encourage more youths to engage in sweet orange production in order to maximise profit. Also, there is the need to encourage farmers (possibly by non governmental organisations) to intensify use of postharvest management practices in order to maximise profit.

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FUNCTIONAL LITERACY AS A SUSTAINABLE TOOL FOR ENTREPRENEURIAL DEVELOPMENT AND EMANCIPATION OF RURAL WOMEN IN NIGERIA

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ABSTRACT

Literacy is crucial for the development of any nation and hence September 8th of each year since 1967 has been set aside as International Literacy Day to promote the importance of literacy as a matter of dignity and human rights. More importantly, functional literacy is an essential tool for entrepreneurial development and emancipation of rural women in a developing country like Nigeria. The national literacy survey of 2010 estimated the adult literacy rate in Nigeria as 56.9% with huge variations between regions (urban 74.6% and rural 48.6%) and sex (male 65.1% and female 48.6%). This indicates that literacy rate among rural women is low. Previous studies have emphasized on increasing literacy rate in Nigeria with little or no focus at enhancing functional literacy of rural women. Hence, this study intends to fill the gap by providing information on the importance of functional literacy for all round development of rural women. The broad objective of this study is to x-ray the roles of functional literacy as a sustainable tool for entrepreneurial development and emancipation of rural women in Nigeria. In order to achieve this broad objective the study reviewed literatures, cited author's experience on the field and focus group discussion. Literacy education helps to equip individuals with the knowledge, skills and attitudes needed for economic self-sufficiency, poverty reduction and sustainable development. In addition it also assists in the attainment of level of writing, reading and numeracy sufficient for the individual optimum participation in his personal and communal life. The paper concluded that rural women in Nigeria should be exposed to functional adult literacy programmes which would enable them to access financial opportunities that would improve their living standards.

Keywords: Functional literacy, Rural women, and Entrepreneurial development.

INTRODUCTION

Development efforts of any nation can be said to be incomplete without the active inclusion and participation of women, both in the rural and urban areas. Often times, the contributions of women to the political and socioeconomic development of their societies and communities are not felt as a result of their marginalization. In the African tradition, the place of a woman is said to be in the home and from birth, she is tutored in the line of assuming the natural role of child bearing, child rearing and housekeeping. Most families prefer to educate the male child who will perpetuate the family name at the detriment of the female child who upon marriage changes to her husband's name.

Women especially those in the rural areas are often seen and treated as second class citizens and this puts them in a situation where they suffer considerable denials of opportunities to partake in decision making, policy formulation and the developmental process both at personal and societal levels. The reason for this is because women in the rural areas are largely non-literate or better put, they are not functionally literate. However, the importance of literacy in the development of any nation can not be over-emphasised. Hence, September 8th of each year since 1967 has been set aside as International Literacy Day to promote the importance of literacy as a matter of dignity and human rights. More importantly, functional literacy is an essential tool for entrepreneurial development and emancipation of rural women in a developing country like Nigeria.

It is no longer news that women especially those in the rural areas form majority of adult illiterates the world over. This is evident in the 2017 report of United Nations Educational, Scientific and Cultural Organisation (UNESCO) Institute for Statistics where the figure of adult illiterates the world over in 2016 was put at seven hundred and fifty million (750, 000, 000) and two-thirds of this figure were women. Similarly, the 2017 UNESCO's report further pointed out that large concentrations of illiterates were found in the developing countries, Nigeria inclusive. According to Ofoegbu and Agboeze (2014), many sections of the Nigerian population do not have access to literacy education or the necessary life skills for economic and social wellbeing. The implication of this is that many adults in Nigeria languish in poverty and ignorance.

In Nigeria, however, the population of women is put at about sixty-eight million three hundred thousand (68, 300,000) according to the National Population Commission's 2006 census report and sadly, about two-thirds of this number were illiterates. The lack of functional literacy has made rural women ignorant on a number of germane issues that concern them, their families and the country at large. However, with functional literacy according to Egwu (2015), women would be exposed to myriads of information which would empower them to control their situations, fight ignorance, poverty and its associated ills and make them to be recognized in the society.

Therefore, it will not be out of place to support the position of Adelore and Olomukoro (2015) that the provision of high quality literacy to

about half of the population will improve lives and livelihood and will no doubt have sustainable social and economic impact on the women folk. Women over the years had limited access to educational opportunities and this has forestalled their contributions to national development. Increasingly, there is a realization that sustainable human development cannot be effective if half of the human race remain ignorant and marginalized. The national literacy survey of 2010 estimated the adult literacy rate in Nigeria as 56.9% with huge variations between regions (urban 74.6% and rural 48.6%) and sex (male 65.1% and female 48.6%). These figures clearly indicate that literacy rate among rural women in Nigeria is low. The implication from this scenario is that if meaningful development in rural areas of Nigeria is to be achieved, improving the literacy rate of rural women becomes imperative. Review of literature has shown that previous studies placed emphasis on increasing literacy rate in Nigeria with little or no focus at enhancing functional literacy of rural women. Hence, this study is conceptualised to fill the gap by providing information on the importance of functional literacy for all round development of rural women. The broad objective of this study is to x-ray the roles of functional literacy as a sustainable tool for entrepreneurial development and emancipation of rural women in Nigeria.

In the process of carrying out this study relevant literatures were reviewed while the author's experience on the field using participatory tool (focus group discussion) was deployed to isolate the important role functional adult literacy can play towards entrepreneurial development and emancipation for rural women in Nigeria.

Why Literacy?

It is estimated that 1 out of 5 people globally are completely illiterate with another 3 billion people struggling to read and write at a basic level (World Literacy Summit 2018). This low level of reading and writing skills, according to Ojokheta (2020) citing UNESCO (2018), cost the global economy around £800 billion each year. The state of being illiterate or non-literate is a major setback for any individual or society at large. Illiteracy poses an enormous challenge to the overall development of any society; therefore, it is adjudged a serious socioeconomic problem. The need for a literate individual or society has made education a key component for development.

Thus, education as observed by Ezeokoli (2010) is a major tool for national socio- economic development and for individual socioeconomic empowerment and poverty reduction. This is why Bakare (2015) opined that people who are illiterates are far more likely to live in poverty and thus facing a lifetime marred by poor health and social vulnerability. No wonder the United Nations Education Scientific and Cultural Organisation (UNESCO) (2016) revealed that the world literacy forum estimated the cost of illiteracy to the world economy to be 1.2 trillion dollars.

The inability of an individual to read or write no doubt traps him/her in a cycle of poverty, having restricted opportunities for gainful employment or income generation. With the attendant problems of illiteracy, Ojokheta (2020) classified the problem of illiteracy into two; basic illiteracy (those who are unable to read and write simple words) and functional illiteracy (those who may be able to read and write simple words but cannot apply these skills to tasks). Ojokheta (2020) further enumerated some of the everyday tasks and choices that require basic and functional literacy skills which include; reading a medicine label, reading food nutrition label, filling out a job application, reading a bank statement, understanding government policies, calculating a financial investment, using a computer or smart phone to read the news and assisting children with homework, among others.

In order to combat illiteracy, Olojede (2016) observed that the Nigerian government has made several efforts dating back to pre-independence, when missionaries established churches and combined preaching and educating people in an attempt for the new converts to serve as secretaries and Sunday school teachers. Since then, various efforts have been put in place to eradicate illiteracy among the people especially, the rural dwellers. However, as reported by Olojede , Adekunle and Samuel (2013) despite several investments in education, literacy level in Nigeria is still put at 60% of the total population, while literacy rate is extremely poor in the rural areas where majority of the nation's population resides. The above sad observation may be due to poor planning and execution of the literacy programmes by the different tiers of government.

Having a literate society comes with its own benefits. These benefits are obtainable both at individual and societal levels. It no doubt ensures the overall development of a nation. Some of the benefits of a literate society include;

a. Literacy brings people out of poverty as possession of the basic literacy skills of reading, writing and numeracy is a great advantage. This is because a literate individual will be able to see and utilise opportunities that exist right before him. With adequate literacy, a window of opportunity is created for people to develop their talents and numerous skills that will put them in a position where they are able to meet personal and family needs.

b. Literacy ensures women empowerment and gender balancing as educated women demand their right and thus literacy assists to lessen the oppression, suppression and marginalisation of women the world over. Furthermore, with

literacy, some of the social, cultural and political instruments of oppression are identified and this will lead to the liberation of women. Moreover, literacy will make women to be economically productive, self-reliant and empowered to contribute meaningfully in the society.

c. Literacy enhances all round economic growth of the society as a society that has majority of its population as literates will benefit positively in terms of social emancipation and also enjoy a massive economic growth. In addition, literacy enhances evenly spread of amenities and opportunities both in the urban and rural centers because educated people will always ask for their rights wherever they reside. The level of productivity of the work force of a society with high literacy rate is expected to be high and this will in turn give the society an enhanced economic strength especially with respect to gross domestic product.

d. Literacy also enhances health and wellbeing, as people with basic education are less vulnerable to various preventable and avoidable health problems. A literate person is better exposed to health education and this will assist in reducing infant and maternal mortality as well as reduction in the rate of self-medication because literate people have better awareness about the dangers of substance abuse. When abuse of drug is minimised the attendance social vices associated to drug abuse will also go down.

Overview of functional literacy

Literacy in the layman's point of view implies the ability to read, write and numerate simple calculations. Indeed, it is the basis of all literacy activities but grossly inadequate to tackle the ever evolving challenges of life. Therefore, emphasis on literacy campaign is now functional literacy which is geared towards the attainment of a level of reading, writing and numeracy that is sufficient for efficient participation and decision making both at personal and societal levels.

The term functional literacy is a form of literacy that ensures the beneficiary is able to apply the principles of literacy to situations where hitherto he/she had not been functioning before in order to better their lives. Succinctly put, functional literacy has been described as work-oriented or relevant literacy that deals with what is taught on the job and also sufficiently comprehensive to teach necessary economic skills which enable the beneficiaries to participate effectively in personal, family and communal matters. According to Encyclopedia.com (2016), functional literacy, also known as survival or reductionist literacy, is a way of equipping or preparing learners for work.

The idea about functional literacy according to Ayodele and Adedokun (2012) citing Egunyomi (2009), gained prominence in the 1960s; in 1962 precisely, UNESCO defined a functionally literate person as one who has acquired the essential knowledge and skills which enable him to engage in all those activities in which literacy is required for effective functioning in his group and community. And these attainments in reading, writing and arithmetic make it possible for him to continue to use the skills toward his own and community's development. Ayodele and Adedokun (2012) therefore posited that everyone in Nigeria should be exposed to this type of literacy because of the numerous economic benefits that can accrue from it.

According to a Focus Group Discussion organised in Erummu Community, Lagelu Local Government Area, the consensus of the participants is that functional literacy empowers the beneficiaries to carry out their work or business in an effective and efficient manner thus enhancing their productivity.

Functional literacy for rural women's entrepreneurial development

The rural woman despite being non-literate, marginalized and at a disadvantaged position could be a job creator who will have people in her payroll, provided she has the right education, opportunity and a favourable environment. This leads to another important area of focus of functional literacy which is its efficacy in enhancing the entrepreneurial skills and knowledge of adult learners especially the rural women.

Entrepreneurship is globally recognized as a crucial and important factor in the development of any nation. This is because attention is shifting from citizens being job seekers to being job creators. According to Gautam and Singh,(2015), an entrepreneur is an individual who is capable of turning ideas into action. This includes; creativity, innovation, risk taking as well as the ability to plan and execute projects with the aim of achieving set objectives. Similarly, Agbonlahor (2016) defines an entrepreneur as a person that is never satisfied with the status quo but is ready and able to turn new ideas or inventions into useful and successful innovations. Therefore, entrepreneurship is becoming increasingly vital in modern economies since it is the main weapon for fighting unemployment and for creation of wealth (Khalifa and Dhaif, 2016).

Defining functional literacy, Ojokheta (2020) citing UNESCO (2006), says it is the ability to use reading, writing and numeracy skills for effective functioning and development of the individual and the community. Hence, functional literacy is a combination of literacy and numeracy with an educational programme in basic vocational

skills directed towards the occupational needs of learners. Functional literacy therefore, is literacy that is of immediate use to the recipient especially in his work and community through which an individual can improve his life and that of his community.

The essence of functional literacy education is to expand the window of opportunities for adult learners especially rural women to become job providers as against being job seekers and thus ultimately making them self-reliant, self-dependent and self-supporting. In order to liberate rural women from illiteracy and poverty so as to attain a desirable level of socioeconomic development there is the need to expose them to sustainable entrepreneurial skills through functional literacy and vocational training. Uriah and Ololube (2016) pointed out that adult and non-formal education in Nigeria can enhance structural changes through appropriate policy framework that will help the sector to benefit tremendously from adequate government, corporate and institutional support to be able to train adult learners that will be job providers in the society.

The place of literacy in the empowerment of rural women

Education the world over is recognized as a major instrument for the promotion and development of women. It is a weapon that should be provided to women to enable them fulfill their roles as responsible members of the society (United Nations, 2013). For any nation that desires serious development; be it political, social and economic or in every area of human endeavor, the need to break or liberate its citizens from unwholesome traditional beliefs, attitudes and practices is imperative. The best way for a nation to develop its citizens is to liberate their minds through education. In the words of Olomukoro (2012), literacy empowers people and it is the most essential of all education skills. Therefore, education, be it formal or non- formal is basic for achieving full promotion and improvement of women's status. In addition, education empowers women by improving their standards of living. Women, especially those in the rural areas are financially handicapped and poverty stricken and this can be linked to their low level of literacy which has kept them marginalized. To reverse this trend, women empowerment has become imperative. This can be achieved when women are given more educational opportunities, skills acquisition, financial access and a strategic position in the hierarch of authority.

Empowerment generally is a process where an individual or group that is powerless or at a disadvantage becomes active and knowledgeable to gain control over resources and decision making process and thereby overcoming inequalities. In the opinion of Liu (2015), empowerment is a training process through which the participants acquire skills in some vocational activities, decision making, literacy and effective participation in governance. To achieve meaningful empowerment and emancipation of rural women, some existing structures, values and process (cultural, social or political) that allow for continuous subordination of women and which are used to justify the inequality in access to political, social and economic resources need to be dismantled.

In the rural areas where agriculture is the dominant occupation engaged in by the rural women, the benefits of functional literacy would come in a variety of ways as skills learnt will help the rural women to engage in value chain to their agricultural produce which could expand their net income. Knowledge of commodity export process and procedure will enhance rural women's productivity and empowerment. Equipped with functional literacy skills, the rural women are aware of current market prices and this ensures they don't fall victims of exploitation by middle men. Also, when rural women are functionally literate, they are able to form co- operative societies where they discuss issues that concern them and chart a way forward for their future.

In order to reach the rural women effectively via functional literacy, it is important that facilitators and organisers bear in mind that learners, especially adult learners, have a particular reason why they want to learn something new. Therefore, suitable strategies to satisfy the yearning and aspiration of potential learners should be adopted. In view of this, Ayodele and Adedokun (2012) listed some strategies that can be adopted for the provision of flawless functional literacy programmes for rural women. These include use of women association networks, group and individual contacts, enlightenment campaigns, radio and television programmes, drama, market association and leaders, community mobilisers, posters, charts and illustrations.

CONCLUSION AND RECOMMENDATIONS

Functional literacy no doubt could be a sustainable tool for the empowerment of rural women especially if they are able to apply the new skills learnt to solve their day to day challenges. Functional literacy should be incorporated into agricultural extension service delivery, while extension agents should be adequately trained to perform the role of facilitators. Similarly, conducive learning environment and timing should be considered for rural women to participate effectively and benefit from various literacy programmes. Spouses of the rural women should not be left out in the whole functional literacy process. This is because as the head of the home, they have the capacity to allow or deny the rural women participation in the literacy programmes. Rural women would be better off if they are

exposed to functional literacy as this would allow them access to financial opportunities that would improve their standard of living and make them better participants in the society.

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